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NATIONAL ABSTRACTS COMPETITIONS

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MEDICAL STUDENTS – RESEARCH PAPERS

FLORIDA PODIUM PRESENTATION - RESEARCH Andrew Collins

N95 Respirator and Surgical Mask Efficacy Against Respiratory Viral Illnesses in the Healthcare Setting: A Systematic Review and Meta-Analysis

Title

N95 Respirator and Surgical Mask Efficacy Against Respiratory Viral Illnesses in the Healthcare Setting: A Systematic Review and Meta-Analysis

Authors

Andrew Collins BS, Benjamin Service MD, Ibrahim Zeini PhD, Sunny Gupta MD, Daryl Osbahr MD

Introduction

Following the past outbreaks of severe acute respiratory syndrome coronavirus (SARS-CoV) in 2003, Middle East respiratory syndrome coronavirus (MERS-CoV) in the last 10 years, and the current COVID-19 pandemic, facemasks have been considered a necessity to reduce the risk of viral transmission, since vaccination and anti-viral treatments may be ineffective or unavailable [1,2]. We aimed to examine the results, level of evidence, and methodological quality of original studies regarding face mask efficacy in minimizing viral respiratory illness transmission, and in particular the N95 respirator versus surgical mask performance.

Methods

A search was performed using the PubMed, MEDLINE, and The Cochrane Library databases for all studies analyzing the efficacy of surgical facemasks and N95 respirators at preventing respiratory transmission of viral diseases such as influenza, SARS-CoV, MERS-CoV, and H1N1, in a healthcare setting. Two independent investigators screened full-text articles for eligibility and assigned a level of evidence using criteria established by the Center of Evidence Based Medicine (CEBM). Data related to type of study, study setting, disease, level of evidence, study population details, intervention, study design, study results, sample size, statistical significance, and risk of bias were analyzed by two independent reviewers. Pooled analyses were used to determine primary outcomes measuring influenza, respiratory viral infections, coronaviruses, laboratory-confirmed influenza, and laboratory-confirmed respiratory viral illness.

Results

A total of eight studies involving 9,164 participants reporting the results of surgical mask or N95 respirator efficacy in reducing viral disease respiratory transmission were found to meet inclusion criteria. Of these eight articles, four were randomized controlled trials (RCTs), three

were case-control studies, and one was a retrospective cohort study. These studies showed a statically significant difference amongst N95 respirator versus surgical mask use to prevent influenza (risk ratio (RR) = 0.81, 95% confidence interval (CI) = 0.68-0.94, $P < 0.05$), non-influenza respiratory viral infection (RR = 0.62, 95% CI = 0.52-0.74, $P < 0.05$), respiratory viral infection (RR = 0.73, 95% CI = 0.65-0.82, $P < 0.05$), SARS-CoV virus infection (RR = 0.17, 95% CI = 0.06-0.49, $P < 0.05$), and laboratory-confirmed respiratory viral infection (RR = 0.75, 95% CI = 0.66-0.84, $P < 0.05$). However, pooled analyses did not indicate statistically significant results regarding N95 respirator use versus surgical masks against laboratory-confirmed influenza (RR = 0.87, CI = 0.74-1.03, $P > 0.05$). Of the included studies, 50% provided level I evidence (high-level), and 50% provided level III evidence (low-level). Our bias assessment indicated that one of the four RCTs had a high-risk of bias, one had some-risk, and the remaining two had low-risk.

Conclusion

Based on this meta-analysis, excluding laboratory-confirmed influenza, N95 respirator use has shown to produce fewer respiratory viral infectious episodes for healthcare workers compared with surgical masks. However, the methodological quality, risk of biases, and small number of original research regarding the topic indicates the necessity for further robust research to be continued in the hospital settings.

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GEORGIA PODIUM PRESENTATION - RESEARCH Rebecca Goldstein

Helping High-Risk Patients Stay Healthy at Home During COVID-19: A Comprehensive Student-Led Clinical and Social Outreach

Title

Helping High-Risk Patients Stay Healthy at Home During COVID-19: A Comprehensive Student-Led Clinical and Social Outreach

Authors

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Introduction

During the COVID-19 pandemic, many patients lack access to the critical healthcare and resources they need. The healthcare gap worsened by COVID-19 is especially pressing for patients Grady Health System, Atlanta's safety net hospital, who rely on regular care for multiple complex comorbidities. As health professional students were removed from clinical rotations, we identified a gap in patient care: from the sidelines, we could support high-risk patients by helping them to navigate the abrupt changes to the healthcare system and proactively addressing health concerns at home. A collaboration between Emory and Morehouse Schools of Medicine and Grady Health System uses 300 volunteer health professional graduate students (MD and PA) for telephonic outreach to thousands at highest risk of poor outcomes if they were to contract COVID-19. We comprehensively 1) screen patients for COVID-19 and educate on prevention; 2) help patients navigate healthcare system changes during the pandemic and fill gaps in their care; and 3) identify and address patients' social needs by connecting them to appropriate resources.

Methods

Fifteen-thousand patients were identified through an artificial intelligence program and prioritized by risk of morbidity and mortality from COVID-19. Students call patients in order of risk. Students designed a novel REDCap form to serve both as a script to facilitate conversations with patients and as a data collection tool to track patient needs. The form provides step-by-

step guidance to screen the patient for COVID-19 symptoms, general health, medications or medical supply needs, and social impacts and support needs. Based on a patient's responses, the REDCap form systematically prompts callers to provide important health reminders, and produces referrals tailored to the patient's needs. Referrals are for health resources (e.g. medications, mental health, and appointments), as well as social resources (e.g. food banks, housing, and rent/utility assistance). Students can conduct three-way calls for additional support, including to the Georgia Crisis and Access Line for acute mental health crises and to the hospital's Nurse Advice Line for urgent health crises at home. Students document the discussion in the medical record and alert the patient's care team with any concerns.

Results

To date, students have made 4,435 calls and 1,772 have been answered. Strikingly, almost half of the patients (47%) required connection to a clinical or social resource: 41% to a medical referral, 27% to medications refills, and 15% to a social referral.

Conclusion

This interdisciplinary initiative leverages students and technology to fill a pressing and new health system gap as a result of COVID-19. These proactive outreach calls have become a required part of the curricula at both medical schools. Early results indicate that this program has filled a clear gap, and an investment from our health system to continue proactive services like this throughout the COVID-19 pandemic and likely during conventional times is paramount.

MISSOURI PODIUM PRESENTATION - RESEARCH Pranav Yayavaram Somasekhar

Validation of F3ALLS Assessment in Older Adults

Title

Validation of F3ALLS Assessment in Older Adults

Authors

Pranav Y. Somasekhar, Nilson Wu, Benjamin Hung, John E. Morley, Theodore K. Malmstrom

Introduction

Falls are one of the most common healthcare conditions that affect older adults today. The WHO estimates 28-35% of people ages 65 or older fall each year (1). There is compelling evidence from meta-analyses that exercise and individually-tailored multifactorial interventions can reduce falls among community dwelling older adults (2). F3ALLS is a falls assessment and management guide for older adult patients that is quick, easy to administer and computerizable in a clinical setting. The aim of this prospective study is to evaluate the validity of the F3ALLS assessment. To do this, we investigate the association of F3ALLS scores with falls 6-months post assessment, and examine the ability of the F3ALLS to discriminate between persons at risk versus not at risk for falls using the gold standard Tinetti Gait and Balance Assessment (TGBA).

Methods

Older adult patients ages 65 to 90 were recruited from the SLU General Internal Medicine and Geriatrics clinics in June-November 2019. The Tinetti Gait and Balance Assessment and F3ALLS surveys were administered at baseline. TGBA is a 16-item functional gait and balance assessment that scores 0-28. F3ALLS assessment scores 0-7 and includes 6 self-reported questions and measurement of orthostatic blood pressure. Participants reported any falls over a 6-month follow-up period in a falls diary, and investigators completed a chart review to identify falls over a 6-month follow-up period. Data were analyzed using SPSS version 19.0. Descriptive statistics are reported as means ± standard deviations or percentages. Logistic regression (odds ratios [OR], 95% Confidence Interval [CI]) is used to investigate the association of F3ALLS scores with falls (any vs. none) at 6-months adjusted for age, gender, and education. Receiver operator characteristic (ROC) curve (area under the curve [AUC], sensitivity, specificity) is used to examine how effectively the F3ALLS assessment discriminates between fall risk (any vs. none) on the TGBA.

Results

Participants (N=97) were older adults ages 73.91±6.4, 68% (n=66) female, and 80% (n=78) had 12 or more years of education. Approximately one-third (n=30) of participants reported at least one fall at 6-months. F3ALLS scores were 3.23±1.5 and 2.35±1.7 for participants who reported 1 or more falls at 6-months versus those reported no falls at 6-months, respectively. Higher F3ALLS scores were associated with 6-month fall risk (OR=1.463, 95% CI=1.098-1.949). A F3ALLS score > 3 stratified patients as at risk of falling (AUC=0.77, P

Conclusion

F3ALLS is a brief, valid measure to assess fall risk among older adults in the outpatient clinic. The F3ALLS questionnaire adequately classifies person at risk versus not at risk for falls, and higher (worse) F3ALLS scores are associated with falls over 6 months. Future studies should investigate the validity and utility of the F3ALLS falls management recommendations.

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NEVADA PODIUM PRESENTATION - RESEARCH Justin S Bauzon

Initial Development and Evaluation of an Algorithm for Identifying Inappropriate Lab Orders

Title

Initial Development and Evaluation of an Algorithm for Identifying Inappropriate Lab Orders

Authors

Justin Bauzon, BA; Caleb Murphy, MD, MBA; Sandhya Wahi-Gururaj, MD, MPH. Department of Internal Medicine, University of Nevada Las Vegas School of Medicine, Las Vegas, Nevada.

Introduction

Inappropriate utilization of daily labs—complete blood counts (CBC) and serum electrolyte panels (SEP)—is an important cause of increased costs in the hospital setting. The Minnesota Lab Appropriateness (MLAB) criteria were previously developed to facilitate assessment of CBC and SEP appropriateness. A combination of clinical judgment and common healthcare data, including recent vital signs and lab results, are used to apply the criteria. Our goal was to develop an algorithm based on the MLAB criteria capable of retrospectively evaluating lab tests for appropriateness.

Methods

The MLAB criteria were translated to formulas as directly as possible. Criteria components relying on clinical judgment were excluded. Standard upper and lower limits of normal were used to define vital sign ranges, with the exception of blood pressure, for which the definition of hypertensive crisis (180/120mmHg) was used for the upper limit of normal. For laboratory values, the upper and lower limits of normal were defined by our institution's reference ranges. Formulas were then formatted into a macro-enabled Excel document using formula functions. Twenty hospitalizations (106 CBCs, 109 SEPs) were evaluated for appropriateness by the algorithm. A physician reviewer independently rated appropriateness of each CBC and SEP using the full MLAB criteria, including the clinical judgment components. Appropriateness was graded on a dichotomous (appropriate/inappropriate) scale. Algorithm and physician reviewer results were analyzed for interrater reliability, sensitivity, and specificity.

Results

The algorithm identified 3% of CBCs and 5% of SEPs as inappropriate, while the physician reviewer using the MLAB criteria identified 29% of CBCs and 11% of SEPs as inappropriate (p

Conclusion

This first iteration of an algorithm for retrospectively identifying inappropriate CBCs and SEPs showed excellent specificity but poor sensitivity compared to a physician applying the MLAB criteria, a previously published approach for assessing lab appropriateness. Interrater reliability was moderate for the CBC component and substantial for the SEP component. The discrepancy between the algorithm and physician reviewer was largely attributable to slightly abnormal vital signs and lab results, such as a heart rate of 105bpm in a patient with post-operative pain. Such values were often interpreted by the physician reviewer as unremarkable but flagged by the algorithm as abnormal, thus warranting future lab orders. Next steps include refining the formulas to improve sensitivity by considering alternative vital sign/lab value ranges, testing the algorithm on a larger data set, comparing algorithm performance versus multiple physician reviewers, and incorporating the tool into quality monitoring workflow at our institution.

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OREGON PODIUM PRESENTATION - RESEARCH Evan J Barnes

Secondary fusions as a mechanism of BCR-ABL1 kinase-independent resistance in chronic myeloid leukemia

Title

Secondary fusions as a mechanism of BCR-ABL1 kinase-independent resistance in chronic myeloid leukemia

Authors

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Disclosures:
B.J.D. potential competing interests-- SAB: Aileron Therapeutics, Therapy Architects (ALLCRON), Cepheid, Vivid Biosciences, Celgene, RUNX1 Research Program, Nemucore Medical Innovations, Novartis, Gilead Sciences (inactive), Monojul (inactive); SAB & Stock: Aptose Biosciences, Blueprint Medicines, EnLiven Therapeutics, Iterion Therapeutics, Third Coast Therapeutics, GRAIL (SAB inactive); Scientific Founder: MolecularMD (inactive, acquired by ICON); Board of Directors & Stock: Amgen, Vincera Pharma; Board of Directors: Burroughs Wellcome Fund, CureOne; Joint Steering Committee: Beat AML LLS; Founder: VB Therapeutics; Sponsored Research Agreement: EnLiven Therapeutics; Clinical Trial Funding: Novartis, Bristol-Myers Squibb, Pfizer; Royalties from Patent 6958335 (Novartis exclusive license) and OHSU and Dana-Farber Cancer Institute (one Merck exclusive license and one CytoImage, Inc. exclusive license)

Introduction

Chronic myeloid leukemia (CML) is defined by the presence of the BCR-ABL1 fusion protein, which results in constitutively active ABL1 tyrosine kinase activity. Although most chronic phase CML patients can be successfully treated with ABL1 tyrosine kinase inhibitors (TKIs), such as imatinib, up to one third of CML patients require alternative treatment. While the most common cause of TKI resistance in CML is the acquisition of BCR-ABL1 kinase domain mutations, many patients demonstrate BCR-ABL1 kinase-independent resistance through other

secondary molecular changes. Unfortunately, most of these aberrations are poorly understood and may confer cross-resistance to multiple approved BCR-ABL1-targeted therapies. Previous reports have described additional chromosomal rearrangements in CML patients at the time of disease transformation to blast crisis (Nucifora and Rowley, Blood 1995; Branford et al., Blood 2018). We hypothesized that secondary fusion proteins may contribute to BCR-ABL1 kinase-independent drug resistance in CML.

Methods

To explore this, we performed paired-end RNA sequencing on a cohort of 91 unique patients comprising three groups: BCR-ABL1 kinase-independent resistance (n=42), BCR-ABL1 kinase-dependent resistance (n=26), and newly diagnosed disease (n=23). Fusions were called using the STAR and TopHat methods, and in-frame fusion transcripts called by both methods were prioritized for analysis. To further evaluate the potential contribution of these fusions to TKI resistance, we retrovirally co-expressed the confirmed fusion protein constructs with BCR-ABL1 in murine Ba/F3 cells. Cell lines were screened against a panel of approved ABL1 TKIs in vitro for 72 hours and analyzed using methanethiosulfonate (MTS)-based assays.

Results

We identified 11 secondary fusions which were recurrently observed among patients with BCR-ABL1 kinase-independent resistance, including both novel fusions and previously identified fusion proteins such as RUNX1-MECOM and CBFB-MYH11. Fusion breakpoint sequences were amplified via PCR in primary patient specimens at the time of resistance and confirmed by Sanger sequencing for 6 of the identified fusions: RUNX1-MECOM, CBFB-MYH11, KDM7A-MKRN1, PDPK1-ATP6V0C, TRDV2-TRAC, and ZNF292-PNRC1. As a case example, a 49-year-old male with CML in accelerated phase and a history of relapse following interferon-alpha therapy and autologous stem cell transplant was treated with imatinib at 600 mg QD. Despite rapidly achieving a complete cytogenetic response (CCR) and subsequent major molecular response, relapse was observed after 16 months, prompting an increase to 800 mg QD. At this higher dose, slight cytogenetic improvement was observed, though the patient failed to regain CCR. At this time, presence of a secondary KDM7A-MKRN1 fusion was confirmed. Intriguingly, we confirmed that expression of KDM7A-MKRN1 was associated with varying degrees of decreased sensitivity to tested ABL1 TKIs, most pronouncedly for imatinib. Evaluation of drug sensitivity for additional fusions is underway and will be presented.

Conclusion

Our findings suggest that secondary fusions, some of which are cytogenetically cryptic, beyond BCR-ABL1 are present in a subset of patients with BCR-ABL1 kinase-independent resistance and demonstrate decreased sensitivity to TKI treatment in vitro. Further characterization of the molecular mechanisms associated with these fusions in the context of BCR-ABL1 open opportunities for identifying new combination treatment strategies to overcome this type of resistance and improve outcomes for these patients.

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QATAR - POSTER FINALIST - RESEARCH Jungyoon Jung

The Effect of Insurance Status on Breast Cancer Mortality

Title

The Effect of Insurance Status on Breast Cancer Mortality

Authors

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Introduction

Early detection and aggressive treatment are essential for preventing unnecessary and early mortality from breast cancer. However, disparities in access to healthcare affect patients' ability to seek screening and medical care. We hypothesize that patients' insurance status affects their likelihood of receiving quality, timely treatment of breast cancer; in turn, insurance status is expected to affect mortality outcomes.

Methods

We used the National Longitudinal Mortality Study (NLMS) database, which includes 745,162 records of patients interviewed in April 2002 and followed for up to six years in the United States [1]. We extracted all records of women for whom "malignant neoplasm of breast" was indicated as the cause of mortality. This search yielded 447 records of women who died within the six years following their interview. We stratified the patients by insurance type and compared the age means. We performed a 2-tailed t-test for independent means to compare the age of patients with and without health insurance in the calendar year prior to the interview. We calculated the Hedges' g to estimate the effect size [2]. Statistical significance in the age at mortality among insured patients was assessed with ANOVA followed by the post-hoc Tukey-Kramer's multiple comparison test [3].

Results

The mean age within six years of mortality for uninsured patients was 48.5 years, which was significantly lower than 64.8 years, the mean age of insured patients (p

Conclusion

Uninsured women with breast cancer are more likely to die of breast cancer at a younger age compared to women with insurance. Thus, patients with limited financial resources, as evidenced by their lack of insurance coverage, are more likely to experience worse outcomes associated with their breast cancer diagnosis, including early mortality. Medicare-covered patients had delayed mortality relative to other insured groups, which warrants further research.

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UGANDA - POSTER FINALIST - RESEARCH Jonathan Kajjimu

Burnout and its associated factors among medical students in a public university in Uganda: a cross-sectional study

Title

Burnout and its associated factors among medical students in a public university in Uganda: a cross-sectional study

Authors

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Introduction

Burnout is an occupational phenomenon that manifests with feelings of stress, fatigue and exhaustion. It's a common and emerging problem among healthcare practitioners. Healthcare professional students are at increased risk of burnout given the rigorous nature of their training. However, there is a scarcity of data on the burden of burnout among this population, especially in Africa. This study aimed to determine the prevalence and factors associated with the development of burnout among students pursuing Bachelor of Medicine and Bachelor of Surgery (MBChB) degrees at Mbarara University of Science and Technology (MUST), Uganda.

Methods

A cross-sectional, online-based survey conducted during the COVID-19 break off holiday in September 2020 among MBChB students of MUST and other Healthcare professional students were excluded. Burnout was assessed using the Maslach Burnout Inventory - Student Survey (MBI - SS) tool and was defined as high levels of emotional exhaustion and cynicism and low level of professional efficacy. Bivariate analysis and backward stepwise logistic regression analysis were done to assess associations between variables related to participants'

demography, socioeconomic, personal, learning environment, outside school environment aspects and burnout prevalence scores.

Results

A total of 145 medical students, 102 (70.3%) of whom were male with a median (range) age of 23 (18 - 40) years were studied. A total of 135 students (93.1%) presented with high levels of emotional exhaustion, 90 (62.1%) students had low levels of professional efficacy scores and 141 (97.2%) of the medical students had high levels of cynicism; overall, 79 (54.5%) students had burnout. Choosing MBChB willingly was identified to be a significant risk factor for burnout (Adjusted odds ratio: 7.2; 95% CI: 1.4 - 36.9; p=0.018).

Conclusion

There was an evidently high prevalence of burnout among the medical students at MUST especially among clinical students. Interventional and preventative measures should be adapted and adopted, and longitudinal studies on the same topic be conducted for monitoring and evaluation.

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INDIA - POSTER FINALIST - RESEARCH Helly Thakkar

Use of various immunomodulator therapy in children with myocarditis-A Network Meta-analysis.

Title

Use of various immunomodulator therapy in children with myocarditis-A Network Meta-analysis.

Authors

Name of Author: H Thakkar, Final year MBBS Students Name of Co-Authors: A Dani and V Shah, Final year MBBS Students.

Introduction

Myocarditis is defined as inflammation of the heart muscle, also known as inflammatory cardiomyopathy. In children, myocarditis is most likely due to viral infections. The most common viruses causing myocarditis in children are: Parvovirus, Influenza virus, Adenovirus and coxsackie virus. Immunomodulator therapy for treatment of myocarditis remains controversial. A number of controlled trials demonstrated that immunomodulator treatment might improve the function in heart failure. Hence, this network meta-analysis was conducted to see the role of different immunomodulators in children with myocarditis.

Methods

A total of 14 RCTs having 879 patients out of which 416 patients received immunomodulator therapy and 463 patients were given conservative treatment following PRISMA guidelines till August 2020 were matched for inclusion and exclusion criteria. The following search strings and MESH terms were used: "immunomodulator therapy", "pediatric myocarditis". Following this, role of different treatment options such as corticosteroids, intravenous immunoglobulin and corticosteroids plus azathioprine or cyclosporine combination on the outcome of rate of death or transplantation was analyzed. RevMan 5.3 was used for appropriate statistical tests. Fixed and Random Effect Model Test were used and p

Results

The adverse outcome of our study was death or need for transplantation. When all of the above mentioned drugs were compared indirectly, corticosteroids had statistically significant increased incidence of adverse outcome as compared to immunoglobulin (RR=2.045, CI=1.558 to 2.683, p

Conclusion

The present network metanalysis does not support corticosteroids single therapy or combination of corticosteroids plus azathioprine or cyclosporine as superior to intravenous immunoglobulin therapy in children with myocarditis Hence, we came to a conclusion that intravenous immunoglobulin might be beneficial in reducing death or need for transplantation in children with myocarditis.

BRITISH COLUMBIA POSTER FINALIST - RESEARCH Hervyn Mayuga

Locus of Control and Perceived Stress in Medical Students

Title

Locus of Control and Perceived Stress in Medical Students

Authors

Hervyn Mayuga, MS4

Introduction

Locus of control (LoC) is the term used to describe the belief system an individual has regarding the causes of the outcomes of their actions, assigned to either external forces – e.g. circumstance or fate – or internal forces – e.g. self-motivation. Though it has been widely used in the health psychology field to explore stress responses related to illness, few studies have explored the relationship between locus of control and individual stress perception. This study aims to assess the difference in stress levels between medical students with different loci of control. It is hypothesized that there is a significant difference between the mean levels of perceived stress in medical students with external locus of control and those with an internal locus of control.

Methods

An observational, cross-sectional study was conducted over the course of two weeks, with surveys administered using Google Forms. Current medical students, regardless of year and age, were eligible to participate in this study. Measurement of Locus of Control was carried out using Rotter's Internal-External Locus of Control scale (Rotter, 1966), a 29-item scale with each question consisting of a forced-choice pair of statements; participants choose the statement with which they agree more. Measurement of perceived stress was carried out utilizing the Perceived Stress Scale, or PSS (Cohen et al., 1994), asking about stressful experiences over the past month. Participants respond on a scale ranging from 0, for "never", to 4 for "very often". The 10-item form (PSS-10) was utilized for this study, based on increased reliability compared to the 14-item or 4-item forms (Cohen, 1988).

Results

Seventy-two medical students, primarily from St. George's University and in their last year of clinical training, participated in this study. Participants were divided into two groups based on their LoC Scale scores, using a cut-off score of 12 out of 23 scored items; any participant with a score greater than 12 was classified as having an internal LoC, while participants with a score lesser than or equal to 12 was classified as having an external LoC. The external LoC group consisted of 35 members, while the internal LoC group consisted of 37 members. An unpaired two-sample T-test was conducted to determine the difference in mean PSS-10 scores between the two groups. The external LoC group had a mean PSS-10 score of 19.37 with standard deviation = 6.723 and 95% CI = 17.14-21.60, and the internal LoC group had a mean score of 24.24 with standard deviation = 6.606 and 95% CI = 22.11-26.37. P = 0.003 for the means of the internal and external LoC groups.

Conclusion

This study indicates there is a significant difference in stress perceived by medical students with differing loci of control; specifically, students with an internal LoC appear to perceive higher stress than those with external LoC. This may influence approaches to mental health and mindfulness techniques for stress relief, especially in this student population; however, further studies should explore these parameters in other medical school student populations at different years of training for greater generalization.

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CALIFORNIA POSTER FINALIST - RESEARCH Shiva Barforoshi

Utilizing Social Media for Quality Improvement of Modified Virtual Internal Medicine Residency Recruitment

Title

Utilizing Social Media for Quality Improvement of Modified Virtual Internal Medicine Residency Recruitment

Authors

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Introduction

In the advent of the COVID-19 pandemic, undergraduate and graduate medical education was faced with the challenge of adapting to virtual models of education and recruitment, placing greater strain on an already complex system. On March 17, 2020 the American Medical Colleges announced an official statement urging medical institutions to temporarily halt medical education. On May 7th, 2020, the Coalition for Physician Accountability released a statement discouraging away rotations and recommending virtual residency interviews for the 2020-2021 academic year. With these shifts, many students and programs turned to social media to network and engage in recruitment. Social media use has significantly expanded across health professions. Among social media tools, Twitter has served as a platform for collaboration, education, and dissemination of resources 1,2. The @InternalMed_Res Twitter account was created on June 26th, 2020 to serve as a valuable centralized resource to support the Internal Medicine (IM) community of medical students, residents, attendings, and institutions.

Methods

InternalMed_Res was founded to improve and augment virtual recruitment for both applicants and residency programs impacted by the disruption and unprecedented stressors of Match 2021. In anticipation of the need for virtual modalities of engagement, InternalMed_Res was designed as a centralized resource for prospective candidates to learn about residency programs and subspecialties within IM, and for programs to be featured and share virtual open events on a public calendar. Particular focus has been placed on conveying residency program

culture, day in the life of a resident, making a more personal connection with program leadership and residents, and other intangibles limited by virtual recruitment. Additionally, applicants have proposed anonymous questions and engaged in discussions unique to virtual interviews and recruitment.

Results

As of December 5th, 2020, the Twitter account had 1,776 followers, 70 of which are IM residency program accounts. The account has had a total of 383 tweets and has been tagged 813 times. The account coined the hashtag #FutureMedRes which has been tagged 104 times. Our tweets have gained 453.5K total impressions, with 68.1K impressions in the last 28 days. Forty events have been shared on our calendar and 14 programs have been featured. Using Twitter Analytics, we calculated a positive correlation between the number of programs featured and the overall number of impressions in a month.

Conclusion

In response to the pandemic and modified virtual residency recruitment cycle, the distribution and quantity of information related to programs have grown exponentially. It is expected that applicants and programs will continue utilizing virtual platforms for the foreseeable future. InternalMed_Res has served as an integral resource for improving the quality of virtual match recruitment. We strongly believe that expanding future social media initiatives similar to ours will optimize utilizing resources to afford applicants and programs the opportunity to transform the vast amounts of information into meaningful decisions.

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CALIFORNIA POSTER FINALIST - RESEARCH Wesley C Dixon

Diabetes with Multiple Autoimmune and Inflammatory Conditions Linked to an Activating SKAP2 Mutation

Title

Diabetes with Multiple Autoimmune and Inflammatory Conditions Linked to an Activating SKAP2 Mutation

Authors

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Introduction

Rapid advances in next generation sequencing have allowed for deep exploration and discovery of rare genetic variants that are linked to disease. For instance, recent insights into type 1 diabetes (T1D) have come from genome wide association studies (GWAS) and studies of rare monogenic disorders which have implicated a host of genes involving immune cell function (1-12). Here, we utilized a similar approach in a single patient presenting with T1D and multiple other autoimmune and inflammatory features, such as Hashimoto's thyroiditis, autoimmune hemolytic anemia, and several severe food allergies. Whole exome sequencing (WES) of the patient and unaffected family members revealed a de novo missense mutation in the SKAP2 gene (c.457G>A, p.Gly153Arg) and the absence of any other known genetic causes of autoimmune disease. Multiple prior GWAS studies have identified a strong genetic linkage between the SKAP2 locus and T1D (6, 13, 14). SKAP2 is a src family kinase member that plays a key role in mediating integrin signaling in myeloid cell populations (15, 16), and currently there are no human diseases associated with aberrant functioning of the SKAP2 protein. We aimed to characterize the functional consequence of this novel SKAP2 mutation to gain insight into how this mutation in myeloid cells might impact immune tolerance and potentially lead to development of the multiple autoimmune pathologies present in the patient.

Methods

We identified a 24-year-old individual with T1D, multiple other autoimmune and inflammatory conditions, and no known history of autoimmune disease. The proband and first-degree relatives were recruited for whole exome sequencing. Only variants with (1) an allele frequency 20, and (3) presence in the proband and absence in unaffected family members were kept for analysis. Functional studies of the SKAP2 p.Gly153Arg variant were performed using primary myeloid immune cells collected from the patient and family members, as well as using a macrophage cell line (THP-1) engineered using CRISPR-Cas9 and retroviral transduction to express the SKAP2 p.Gly153Arg mutation. Functional studies included immunofluorescent imaging and Western blotting in response to integrin stimulation.

Results

Sequencing identified a de novo SKAP2 variant (c.457G>A, p.Gly153Arg) in the proband. Assays using monocyte-derived macrophages from the individual revealed enhanced activity of integrin pathways and a migratory phenotype in the absence of chemokine stimulation, consistent with SKAP2 p.Gly153Arg being constitutively active. The p.Gly153Arg variant, located in the well-conserved lipid-binding loop, induced similar phenotypes when expressed in a human macrophage cell line (THP-1).

Conclusion

When combined with previous GWAS studies linking SKAP2 with T1D, our results indicate that SKAP2 p.Gly153Arg is a gain-of-function, pathogenic mutation that promotes excessive myeloid immune cell function, namely increased activity and migration of macrophages. This results in a break in immune tolerance and thus complex autoimmunity, including the development of T1D. These results are the first to connect aberrant SKAP2 function with human disease.

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CALIFORNIA POSTER FINALIST - RESEARCH Mason Price

Histopathological Changes of Nonalcoholic Fatty Liver Disease in Children

Title

Histopathological Changes of Nonalcoholic Fatty Liver Disease in Children

Authors

Mason Price, UC San Diego School of Medicine; Nicole Hickman, UC San Diego School of Medicine; Ariel Feldstein, UC San Diego School of Medicine, Rady Children's Hospital San Diego

Introduction

Nonalcoholic fatty liver disease (NAFLD) is currently the second most common indication for liver transplantation in the United States. NAFLD represents a spectrum of disease ranging from mild or isolated steatosis to nonalcoholic steatohepatitis (NASH) with fibrosis and cirrhosis requiring transplant. The prevalence of NAFLD in adults and children has increased dramatically in recent years, currently estimated to affect up to 46% of US adults and up to 10% of US children. Despite this wide prevalence, the natural history of NAFLD in children, including histological outcomes over time, remains unclear.

Methods

We retrospectively identified 22 children with NAFLD seen at Rady Children's Hospital San Diego between January 1, 2012 and February 1, 2018 who underwent serial liver biopsies (68% male; 27% white; 91% Hispanic; mean age at first biopsy, 10±2.6 years; mean age at second biopsy, 15±2.4 years; age range, 5–19 years). We examined histological outcomes and changes in these children with respect to their initial biopsy.

Results

At the time of first biopsy, six children (27%) had definite NASH, 15 (68%) had borderline NASH, and one (5%) had NAFLD without evidence of steatohepatitis. Fibrosis was present in 8 of the children (36%), including three of the six with definite NASH (14%). Over a mean period of 4.4±2.0 years (range, 1.9–9.0 years), five children (23%) progressed from borderline to definite NASH. NASH improved to borderline NASH in 3 children (14%). Fibrosis resolved in five children (23%), while four (18%) developed fibrosis and two (9%) had progression of existing fibrosis. Improvement in NASH or fibrosis occurred in seven children (32%), with one child experiencing improvement in both NASH and fibrosis (5%). Progression to definite NASH or progression of fibrosis occurred in 8 children (36%), while both occurred in 3 children (14%). Interestingly, one

child who progressed to definite NASH also showed resolution of fibrosis during the same period, while another child whose existing NASH had worsened also had resolution of fibrosis. Time since previous biopsy, along with persistently and/or increasingly elevated liver chemistry, prompted repeat biopsy in 21 of the children (95%); one child underwent repeat biopsy during incidental cholecystectomy after MRI demonstrated persistent fatty liver two years after the first biopsy.

Conclusion

Children with NAFLD may show progression to NASH or fibrosis, as well as improvement in NASH or fibrosis, within a few years. In serial biopsies, resolution of prior fibrosis may be seen even in the context of worsening NASH.

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CALIFORNIA POSTER FINALIST - RESEARCH Ema Shah

Seeing is Believing: Efficacy of a Video-Based Intervention in Improving Awareness of Skin Cancer Risk for Solid Organ Transplant Recipients

Title

Seeing is Believing: Efficacy of a Video-Based Intervention in Improving Awareness of Skin Cancer Risk for Solid Organ Transplant Recipients

Authors

Ema Shah B.A., Shannon Michalak B.S., Renee Haughton B.A., Braulio Fernandez B.S., Iris Ahronowitz, MD

Introduction

Despite improvement in the life expectancy of solid organ transplant recipients (SOTR), these patients remain at elevated risk of developing non-melanoma skin cancer, with resultant morbidity and mortality. Patients of color, including Black and Hispanic patients, tend to be diagnosed and treated later for skin cancer, partly due to less awareness and lower rates of screening for skin cancer. It is critical to find ways to better educate diverse populations about skin cancer risk for SOTR and facilitate lasting behavior change. A number of studies have examined the most effective media to deliver sun protection and skin cancer information to the general population. Video-based messages, as compared to written materials, resulted in greater retention of key information, increased satisfaction with teaching, and were more likely to lead to behavior change. We developed a novel video-based intervention to improve awareness of the risk of non-melanoma skin cancer for SOTR.

Methods

In this ongoing prospective study, SOTR from our majority-Hispanic patient population at Los Angeles County Hospital and Keck Hospital of USC seen by our dermatology department were enrolled. Participants completed a pre-intervention survey measuring their perceived risk of developing skin cancer and their sun protective behaviors. We developed an informational video in English and Spanish highlighting the increased risk posed to transplant recipients in developing non-melanoma skin cancer and preventive strategies, including sunscreen, protective clothing, self-skin checks, and dermatology follow ups. After viewing the video, patients were completed a post-intervention survey to see if their perceptions and practices regarding skin cancer had changed.

Results

A total of 48 SOTR patients were enrolled in the study. We analyzed the results of 13 patients who completed both the pre- and post- intervention survey. 92% of patients reported sunscreen use post-intervention. In addition, 77% of patients reported an improved understanding of their skin cancer risk and 69% of patients had checked for skin cancer in the past month of completing the post-intervention survey. Our demographics in this pilot study do not represent the majority-Hispanic population of Los Angeles County Hospital and Keck Hospital of USC. We are currently enrolling more patients in hopes of achieving a more representative demographic breakdown.

Conclusion

Our study builds on prior literature which demonstrates the efficacy of video-based messaging and intervention on behavior change to reduce the risk of skin cancer in the general population as well as in SOTR. This intervention presents a cost-effective and timely method to increase awareness of skin cancer for at-risk patients. Our research team will continue monitoring these patients to measure sustained behavior change and better test the efficacy of video-based interventions to deliver key health information.

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CONNECTICUT POSTER FINALIST - RESEARCH Aaron Smith

Hepatitis C in Connecticut community clinics: Measuring the impact of the project ECHO model on treatment in primary care

Title

Hepatitis C in Connecticut community clinics: Measuring the impact of the project ECHO model on treatment in primary care

Authors

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Introduction

3.5 million Americans are living with chronic hepatitis C virus (HCV), a viral infection of the liver which, prior to COVID-19, killed more people in the US than any other infectious disease. A significant barrier to treatment is a lack of training of primary care providers (PCPs). The Project Extension for Community Healthcare Outcomes (Project ECHO), a telemedicine model for training PCPs, has been used to address this barrier, with treatment outcomes comparable to those of gastroenterology (GI) specialists. Community Health Center, Inc. (CHC) in Connecticut has been operating a hepatitis C virus (HCV) ECHO program since 2012. This study aims to evaluate the program's efficacy in changing provider behavior and increasing rates of treatment among HCV patients.

Methods

This is a retrospective cohort study including the 2,638 HCV patients in primary care at CHC from 2012-2019. A population analysis was conducted, comparing individuals in three treatment groups: patients treated in primary care, referred to GI, and neither. A multinomial logistic regression was used to create a predictive model for these groups. A Fisher's exact test was used to compare patients treated in primary care who did and did not have an ECHO-trained PCP.

Results

Compared to the other two treatment groups, patients treated in primary care were more likely to have an ECHO-trained PCP, as well as be Hispanic, male, HIV-positive, have opioid use disorder (OUD), and have advanced fibrosis or cirrhosis. Primary care patients of ECHO-trained providers were more likely to be Caucasian, not Hispanic or Latino, male, HIV-positive, and have

OUD. Although 52.6% of patients treated in primary care had a PCP who was ECHO-trained, 81.3% of patients treated in primary care were prescribed medication by an ECHO-trained provider. Notably, having an ECHO-trained PCP was found to be a positive predictor of treatment in primary care (OR=1.611; 95% CI=1.332 – 1.949; p=

Conclusion

The results suggest that CHC's HCV ECHO program works. Not only were patients of ECHO-trained providers more likely to be treated in primary care, but ECHO-trained-providers were responsible for the great majority of treatment in primary care. Moreover, patients who were the most medically complicated, based on the presence of advanced liver disease and HIV, were more likely to be treated in primary care, and more likely to be treated by an ECHO-trained PCP. The success of this program suggests that the ECHO model can be extremely effective in increasing access to care, by creating a significant change in provider behavior and increasing treatment in primary care. If the United States hopes to achieve its nation-wide goal of HCV elimination, the ECHO model should be an integral part of a multi-faceted approach.

DISTRICT OF COLUMBIA POSTER FINALIST - RESEARCH Aneka Khilnani

Retrospective review characterizing the CNH vulvar dermatology clinic

Title

Retrospective review characterizing the CNH vulvar dermatology clinic

Authors

Kaiane Habeshian, MD Tazim Dowlut-McElroy, MD Aneka Khilnani, MS

Introduction

This study aims to characterize the diseases seen in a multispecialty pediatric dermatology-gynecology vulvar clinic at Children's National Hospital (CNH) in Washington, D.C.. Though dermatologic findings involving the vulva may present to a variety of practices, ranging from pediatric primary care, dermatology, gynecology, or urology, few training programs provide significant training on the interdisciplinary knowledge needed to accurately diagnose pediatric vulvar dermatologic diseases. To our knowledge, very few multispeciality clinics bring together dermatology and gynecology, especially in a pediatric setting. Based on experience in our multidisciplinary pediatric dermatology-gynecology vulvar clinic, we aim to highlight the benefits of a multispeciality clinic and showcase the conditions diagnosed, managed, and treated. Additionally, we will explore relevant epidemiological factors seen in this patient population.

Methods

We conducted a retrospective review of 180 patient charts from pediatric patients seen at the joint dermatology-gynecology at CN, at least once between January 2016 and June 2020. Data collected from the charts included patient diagnosis, demographics, vulvar symptoms, and prior care related to the patient's vulvar symptoms. Data was entered into a RedCap database and analyzed.

Results

Among the 180 patients seen (mean age 6.89 ±SD 4.63), the three most common conditions seen in the clinic are as follows: pediatric vulvar lichen sclerosus (69.9%), vitiligo (21.69%), and vulvovaginitis (21.69%). In total, 83 conditions were evaluated in this multispeciality clinic. Approximately 17.8% of patients with pediatric lichen sclerosus and 38.9% of patients with

vitiligo were misdiagnosed at least once. On average, from the time of symptom onset to a diagnosis, those with PVLS waited 14.58 months and those with vitiligo waited 10.29 months till diagnosis. Of those with PVLS who first received a misdiagnosis, 92.8% of the time the diagnosis was made outside of the dermatology-gynecology clinic. Of those with vitiligo who first received a misdiagnosis, 75.0% of the time the diagnosis was made outside of the dermatology-gynecology clinic. In the paper, epidemiological factors for the clinic as a whole and for the three most common diseases are discussed.

Conclusion

Our study addresses a gap in published information on pediatric vulvar symptoms and patient characteristics in a multispecialty dermatology-gynecology interdisciplinary clinic. The chart review highlights the variety of conditions seen and complexity of care faced in a pediatric dermatology-gynecology clinic, with emphasis on the risk for a delay in diagnosis when vulvar symptomatology is diagnosed in patients seen outside of a dermatology-gynecology clinic initially. Enhanced training at the pediatric primary care level is needed to help guide clinicians in accurately diagnosing pediatric vulvar complaints.

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FLORIDA POSTER FINALIST - RESEARCH Aaiz Hussain

Systematic review of CRISPR/Cas9 system-based therapies for HIV-1 treatment in CD4+ T-cell models

Title

Systematic review of CRISPR/Cas9 system-based therapies for HIV-1 treatment in CD4+ T-cell models

Authors

Aaiz Hussain*, Patrick Hardigan* Ph.D, and Samiksha Prasad* Ph.D *Dr. Kiran C. Patel College of Allopathic Medicine, Nova Southeastern University, Davie, USA

Introduction

HIV-1 infection remains a worldwide health concern. According to statistics from World Health Organization (WHO), about 38 million people around the world were living with HIV-1 by the end of 2019. Anti-viral therapy has been successful in reducing viremia in HIV-1 patients; however, it does not eliminate HIV-1 from latently infected T-cells. Clustered regularly interspaced short palindromic repeats (CRISPR)-associated endonuclease Cas9 has emerged as a potential avenue for curing latently infected CD4+ T-cells. It recognizes specific DNA sites using an RNA component. The RNA component uses a 20-nucleotide guide sequence or gRNA for short to hone in on the site. Cas9 cleaves DNA and after specific insertion or deletion is ultimately repaired through non homologous end joining mechanism of repair.

Methods

By gathering studies that have carried out research on this technique in curing HIV-1 infected CD4+ T-cells, we summarize and discuss the current capabilities of CRISPR/Cas9 as a potential treatment option for HIV-1 infected individuals. Two major databases were screened to find studies that performed CRISPR/Cas9 work into HIV infected T-cells. Inclusion criteria: a) Study had to be published (peer reviewed) after 2007 and b) Study citations were = 20.The infection rates of CRISPR/Cas9 intervention were compared, which were standardized to percentages. A forest plot was created using RevMan with a confidence interval of 95%. R-4.2.1 program was used with Hedges's g as our measure of effect size for studies that had n>1 for controls to perform a random effect analysis.

Results

Our forest plot, which is a plot of the measure of effect of our studies, gave us a standard mean difference of -8.79 with a [-11.23, -6.36] confidence interval. This means the standard mean difference fell towards favoring the CRISPR/Cas9 intervention, implying that the interventions were successful, on a statistical level. The studies employed CRISPR/Cas9 with different targets ranging from altering CCR5 or using anti-viral gRNAs targeting various sites of the HIV-1 genome. Statistical analysis showed that the studies that knocked out CCR5 receptor in T-cells, which is an essential an essential coreceptor used by HIV-1 for entry, showed far lower infection rates than studies that targeted the viral genomes.

Conclusion

We conclude that CRISPR/Cas9 is still in its infancy yet there is a strong basis for future work to be conducted. Future research should be conducting in further the testing in knocking out the CCR5 coreceptor in CD4+ T-cells as a possible cure for latent HIV-1 infection. After further optimizations and success and only after that, it is our recommendation for clinical trials to be pursued.

FLORIDA POSTER FINALIST - RESEARCH Naser Mubarak

An Examination of Temporal Trends in Health Behaviors Among US Children, Adolescents, and Adults from 2005-2016

Title

An Examination of Temporal Trends in Health Behaviors Among US Children, Adolescents, and Adults from 2005-2016

Authors

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Introduction

Lifestyle-related health behaviors, such as smoking, alcohol consumption, diet, physical activity, and sleep hygiene, are major contributors to the development and progression of preventable chronic disease. The purpose of this project was to characterize temporal trends in health behaviors of US children (age 2-11), adolescents (12-19), and adults (20 years and older) between 2005-2016 and examine the association of sociodemographic factors with clustering of unhealthy behaviors (?2 behaviors) using the National Health and Nutrition Examination Survey (NHANES).

Methods

This study was a secondary data analyses of repeat cross-sectional data from the National Health and Nutrition Examination Survey (NHANES). NHANES uses a multistage, stratified sampling design to assess the health and nutritional status of a nationally representative sample of the civilian, non-institutionalized, US population.7 Data were acquired via self-report questionnaires and interviews designed by the National Center for Health Statistics of the

Centers for Disease Control and Prevention. The years of NHANES data included in this study were 2005/2006, 2007/2008, 2009/2010, 2011/2012, 2013/2014, and 2015/2016. The NHANES protocol is approved by the NCHS Research Ethics Review board. The study population included children ages 2 to 11 years, adolescents ages 12-19 years, and adults ages 20 years and older who completed a 24-hour dietary recall (n=50,038). Our analyses assessed these age groups separately to see how patterns in lifestyle health behaviors varied across age groups. We excluded women who were pregnant at the time of the survey since their health behaviors reported may not have reflected their normal habits when not pregnant (n=656, 1.3%). We subsequently excluded 2,589 participants (5.2%) who were missing data on any of the health behaviors examined in the analysis, which included diet, physical activity, screen time, fast food consumption, smoking (adolescents and adults), alcohol (adults), and sleep (adults), for a total analytic sample size of 46,793 participants.

Results

The results demonstrated an increase in the proportion of children and adolescents not meeting the physical activity guidelines over time and increases in screen time among all age groups. Dietary quality improved and smoking prevalence declined among both adolescents and adults, while fast food consumption declined among adolescents only. Unhealthy behavior clustering among children increased by 13%. Children and adolescents that identified as non-Hispanic Black, were older, or had unmarried parents/guardians had higher odds of clustering of unhealthy behaviors. Adults that identified as non-Hispanic black, were younger, had lower educational attainment, did not have private health insurance, and had lower incomes were also at increased risk for clustering of unhealthy behaviors.

Conclusion

In a nationally representative sample of U.S. children, adolescents, and adults examining trends from 2005-2016, dietary patterns largely improved, screen time increased, and physical activity declined among youth. Results suggest screen time and physical inactivity as particularly important areas to target with public health prevention campaigns.

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GEORGIA POSTER FINALIST - RESEARCH Rebecca Goldstein

Taking the Time to Listen: Executing Patient-Driven Care Plans with High-Need, High-Cost Patients Through Atlanta Interprofessional Student Hotspotting

Title

Taking the Time to Listen: Executing Patient-Driven Care Plans with High-Need, High-Cost Patients Through Atlanta Interprofessional Student Hotspotting

Authors

Rebecca Goldstein, MPH - Emory University School of Medicine, Atlanta, GA; Manasvi Sundar - Emory University Rollins School of Public Health, Atlanta, GA; Emma Chandlee - Mercer University College of Pharmacy, Atlanta, GA; Samir Sarda, MPH - Philadelphia College of Osteopathic Medicine - Georgia, Suwanee, GA

Introduction

Atlanta Interprofessional Student Hotspotting (AISH) is a multi-institutional, interdisciplinary service learning program that provides graduate students across various medical and health professions the opportunity to engage directly with high-need, high-cost (HNHC) medical patients. Nationwide, HNHC patients make up only 5% of the patient population, but account for 50% of healthcare costs. In Atlanta, Student Hotspotters aid in addressing socioeconomic and environmental determinants of health for HNHC patients within Grady Health System (Grady), the city's largest safety net system. Our goal is to advance interprofessional education among health professionals while simultaneously improving patient care and outcomes for both patients and Grady.

Methods

During the 2019-2020 program year, AISH's direct patient support initiative was based at Grady's Chronic Care Clinic (CCC), a clinic for HNHC patients who have frequent emergency department visits and hospital admissions. Student Hotspotting teams interviewed and enrolled CCC patients in the 6-month AISH program. First, students used standard re-admission interviews and the "five whys" approach to help patients identify root causes of their repeated admissions. Student Hotspotters then assisted patients with both determining their health goals and leading the development of personalized care plans. Students and patients partnered to navigate the barriers to reaching patients' stated goals first by building trusting relationships, and later by helping to access necessary social resources and iteratively improving health literacy. Using both quantitative and qualitative participant data, AISH conducted exploratory

analyses to determine the key factors leading to high healthcare utilization among this population.

Results

Of the 20 enrolled patients, participants averaged 67 years of age and the majority were African American (n=17, 85%). The most commonly reported root causes of readmission were unstable housing (n=7, 35%), medication instability (n=4, 20%), and lack of transportation (n=4, 20%). Outcomes from addressing these concerns included facilitating access to health insurance, joining patients at healthcare appointments to increase attendance and improve health literacy, reunifying patients with their communities, applying for subsidized housing, accessing food stamps, and preparing patients for the job market.

Conclusion

The Atlanta Interprofessional Student Hotspotting program has provided students with the opportunity to learn actively about the complex medical and social needs of HNHC patients all while helping patients build self-efficacy and navigate the healthcare system. The dedicated time spent developing relationships with patients and the patient-led nature of care plans yield supportive care that is comprehensive yet focused on addressing the root causes of patients' high healthcare utilization. Future analyses will examine ED visits and readmission rates for enrolled patients. Moving forward, AISH's interprofessional cohort will expand and supplement our direct patient support work by developing and implementing community-level interventions that address the root causes of high utilization we identified.

HAWAII POSTER FINALIST - RESEARCH Brendan Seto

Calibrating Pre-Operative Cardiac Risk Scores in a Majority-Minority Population

Title

Calibrating Pre-Operative Cardiac Risk Scores in a Majority-Minority Population

Authors

Brendan Seto Todd Seto, MD, MPH Affiliation: Mr. Brendan Seto & Dr. Todd Seto: John A Burns School of Medicine, University of Hawaii - Honolulu, HI Dr. Todd Seto: The Queens Medical Center

Introduction

There are significant racial/ethnic disparities in the burden of cardiovascular disease and its risk factors. Pre-operative risk assessment tools are often used to assess surgical risk and eligibility. Often developed in general population samples, the applicability of these tools to underrepresented populations is unclear. To determine the accuracy of pre-operative risk tools in a majority-minority population, we assessed the accuracy of two commonly used cardiac surgery risk scores, Society of Thoracic Surgeons (STS) score and EuroSCORE II, in a predominantly Asian and Pacific Islander (NHOPI) population undergoing coronary artery bypass graft (CABG) surgery in Hawaii.

Methods

Data are from the cardiac surgery registry at The Queen's Medical Center, a tertiary care, 500-bed, university-affiliated hospital in Hawaii. Trained nurse reviewers abstracted data on all cardiac surgeries from 2009-20 using standard definitions. For each patient, STS and EuroSCORE II risk of mortality were calculated. This analysis only included patients who underwent isolated CABG (n=4061). For each risk of mortality score, we calculated the area under the curve (AUC) and then used deLong's test for correlated ROC curves to compare results.1 We evaluated model calibration by graphing expected vs observed mortality, which displayed differences across the spectrum of risk scores.2 To compare model accuracy by race/ethnicity, we compared AUCs and calibration curves among Asians, NHOPI and whites.

Results

Asians accounted for 51% (n=2076), NHOPI 24% (n=977) and whites 23% (n=919) of patients. Patients were 64.4 yo, with 24% female and 58% diabetic; 45% underwent elective surgery. Both STS and EuroSCORE models predicted mortality well, with STS having significantly better

discrimination (AUC 0.84 vs 0.78, p7.0%), both models were less accurate for NHOPIs than whites (Euro: 0.55 vs 0.69, p=0.047; STS: 0.60 vs 0.73, p=0.03). EuroSCORE performed significantly better among Asians than whites (0.82 vs. 0.69, p = 0.002), while STS was less accurate (0.60 vs 0. 73, p = 0.025).

Conclusion

In our study of a majority-minority, predominantly Asian and NHOPI population undergoing cardiac surgery, we found that two commonly used pre-operative mortality risk tools performed well, particularly among patients at low-risk. However, their accuracy significantly varied by race/ethnicity among those at high-risk for mortality. Physicians should understand the limitations of pre-operative risk tools, particularly when applied to racial/ethnic minorities. Further work is needed to understand the impact of calibrating risk scores for patients from underrepresented groups.

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ILLINOIS POSTER FINALIST - RESEARCH Matthew Du

Association of Intrinsic Motivating Factors and Joy in Practice: A National Physician Survey

Title

Association of Intrinsic Motivating Factors and Joy in Practice: A National Physician Survey

Authors

Matthew Du, BS

Hyo Jung Tak, PhD

John D. Yoon, MD

Introduction

As physician burnout becomes more prevalent, numerous efforts have attempted to address it through interventions at an individual and institutional level.1 Some have framed this effort as a movement to rekindle the joy of medicine.2-5 Joy in Practice has been defined as the aspirational state in which professionals are emotionally and behaviorally compassionately engaged in the care of patients and the mission of their organization.2 Though a relatively new concept, Joy in Practice has not been commonly studied in physicians. Although a few studies have assessed this concept through a stand-alone measure such as physician satisfaction,6 resilience,7 or burnout,8 the definition of Joy in Practice is multi-faceted and thus, cannot be easily captured by measuring a single dimension of the construct. This study attempts to empirically operationalize the Joy in Practice concept according to its collective meaning in terms of enthusiasm, fulfillment, and clinical stamina. We will assess its relationship with commonly used markers of physician well-being in the literature and measure its association with certain intrinsic motivators, which have previously demonstrated strong associations with physician well-being.9

Methods

A nationally representative dataset of 2,000 U.S. physicians, 800 primary care physicians and 1,200 specialists, was fielded October to December 2011. Multivariable logistic models with survey design provided nationally representative individual-level estimates. Primary outcome variables included Joy in Practice (enthusiasm, fulfillment, and clinical stamina in an after-hours setting). Secondary outcomes were validated measures of physician well-being: career satisfaction, life satisfaction, high life meaning, commitment to direct patient care, and

commitment to clinical practice. Primary explanatory variables were burnout and intrinsic motivators: sense of calling, number of personally rewarding hours per day, long-term relationships with patients.

Results

The survey response rate was 64.5% (1,289/2,000). Physicians who demonstrated Joy in Practice were most likely to report high life satisfaction (OR 2.75, 95% CI 1.52-4.98) and high life meaning (OR 2.62, 95% CI 1.41-4.85). Among physicians who reported high job satisfaction, 82.8% were not experiencing Joy in Practice. In addition, 5.9% and 21.0% of physicians who were and were not burned out, respectively, experienced Joy in Practice. Joy in Practice was strongly associated with having a sense of calling (OR 10.8, 95% CI 2.21-52.8) and ≥7.5 personally rewarding hours per day (OR 3.75, 95% CI 1.51-9.36); meanwhile, it was negatively associated with burnout (OR 0.26, 95% CI 0.14-0.51). Extrinsic factors such as income and physician specialty were not significantly associated with Joy in Practice.

Conclusion

The Joy in Practice measure shows preliminary promise as a positive marker of physician well-being, demonstrating positive associations with commonly used markers of physician well-being. However, Joy in Practice and other markers of well-being may not be totally convergent in nature. Our findings suggest that a considerable proportion of physicians who lack burnout are not experiencing Joy in Practice. Just as there have been countless efforts to mitigate the negative experiences of burnout, an equal emphasis is needed to support physicians' intrinsic motivators in medicine while promoting work environments that foster joy in one's practice.

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ILLINOIS POSTER FINALIST - RESEARCH Madison Wilson

They'll tell the police I have a gun: A qualitative study on healthcare screening for gun possession in Chicago

Title

They'll tell the police I have a gun: A qualitative study on healthcare screening for gun possession in Chicago

Authors

Madison Wilson, BA, University of Chicago Pritzker School of Medicine; Nichole Smith, BS, University of Chicago Pritzker School of Medicine; Monica Peek, MD, MPH, University of Chicago, Section of General Internal Medicine; and Elizabeth Tung, MD, MS, University of Chicago, Section of General Internal Medicine

Introduction

Gun violence is increasingly recognized as a public health issue, associated with negative patient outcomes, but whether or not physicians should intervene remains fiercely contested. While some states have enacted laws that limit physicians' ability to screen for gun possession, multiple medical associations encourage them to do so. Few qualitative studies, if any, have examined patient perspectives about healthcare screening for gun possession, particularly in an urban setting.

Methods

We recruited 40 patients, aged greater than or equal to 35 years, from a Chicago primary care clinic to participate in an in-depth focus group or semi-structured interview to elucidate patients' experiences with and perspectives regarding healthcare screening for gun possession/safety. Audio recordings were transcribed verbatim and analyzed using grounded theory and the constant comparison method.

Results

The mean age of participants was 60.7±10.8 years. Participants were predominantly female (67.5%) and Black (90%). Many reported prior experiences with violence as a direct victim (47.5%), witness (36.8%), or close friend or family member of someone who died violently (42.1%). Almost one-quarter (22.5%) reported possession of any rearm, but few had ever discussed gun possession/safety (5.3%) with a healthcare provider. One-third (34.2%) reported that screening for gun possession/safety was never appropriate. Patients voiced significant

concerns about screening. Most notably, many shared concerns about discrimination, stigma, and encounters with the criminal justice system, stating, “If the doctor asks [about guns], patients will think they’re going to get locked up.” Other themes included insufficient time to screen during encounters, doubts about the providers’ ability to effectively intervene, and fears about gun possession data in the EHR. Patients acknowledged some benefits to screening, for instance, identifying patients at risk for suicide or improving gun safety. When speaking about benefits of screening for gun possession and safety, one participant stated, "I think it would be a good question for the doctor to ask for the fact that there have been so many gun problems and violence and shootings and killings. I think it would be a good question just to incorporate into their priorities." In the context of these barriers to and benefits of screening for gun possession and safety, participants identified several strategies for making screening more acceptable for all patients. These strategies included screening in the context of a strong patient-provider relationship, screening by a healthcare worker prior to medical appointments, and emphasizing screening for all patients rather than for a select group.

Conclusion

Limitations of this study include limited generalizability, as we interviewed a group of primarily Black participants on the South Side of Chicago who may not be representative of other urban, Black populations. Additionally, given the sensitive nature of this topic, some participants may have understated their opinions. Despite important benefits related to healthcare screening for gun possession, many patients noted significant concerns. Emergent themes may serve as targets for making screening more acceptable for all patients.

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IOWA POSTER FINALIST - RESEARCH Andrew Philipose

Renal cortical KLF15 and KLF2 are downregulated in chronic heart failure

Title

Renal cortical KLF15 and KLF2 are downregulated in chronic heart failure

Authors

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Introduction

Type II cardiorenal syndrome is characterized by renal dysfunction resulting from chronic heart failure (CHF). CHF is associated with increased sympathetic stimulation of the kidney, hemodynamic abnormalities, and activation of the renin-angiotensin system (RAS) which are thought to collectively contribute to renal hypoxia and tissue injury. KLF15, which is downregulated by both RAS activity and hypoxia, plays an important protective role in the kidney by constraining pro-fibrotic connective tissue growth factor (CTGF). Hemodynamic abnormalities in CHF may lead to downregulation of the shear-sensitive transcription factor KLF2, which can mitigate fibrosis via activation of Nrf2. In addition, hypoxia has been shown to cause downregulation of anti-fibrotic E-cadherin. We hypothesized that KLF15, KLF2, and E-cadherin expression would be reduced and that CTGF, and Collagen I & III expression would be increased in CHF.

Methods

To test these hypotheses, cDNA was plated with primers for KLF15, KLF2, CTGF, E-cadherin, Collagen I & III, and ß-Actin, and analyzed via qRT-PCR. Two-factor independent samples T-tests or Mann-Whitney U tests were used for statistical analysis, as appropriate.

Results

We observed that KLF15, KLF2, E-cadherin, and Collagen III, were downregulated in CHF vs sham.

Conclusion

In conclusion, renal hypoperfusion, RAS activation, and attendant tissue hypoxia may lead to repression of KLF15, KLF2, and E-cadherin and related disinhibition of pro-fibrotic signaling in CHF.

IOWA POSTER FINALIST - RESEARCH Kalie Savage

Effect of chronic intermittent hypoxia on inflammation and redox related gene expression in renal cortex

Title

Effect of chronic intermittent hypoxia on inflammation and redox related gene expression in renal cortex

Authors

Kalie A. Savage(1), Andrew Philipose(1), Kiefer W. Kious(2), Jayson P. Kemble(1), Luke J. Smith(1), Hugo S Díaz(3), Rodrigo Del Rio(3), Noah J. Marcus(1,2) (1)College of Osteopathic Medicine, Des Moines University Medicine and Health Sciences, Des Moines, IA (2)Department of Physiology and Pharmacology, Des Moines University Medicine and Health Sciences, Des Moines, IA (3)Laboratory of Cardiorespiratory Control, Pontificia Universidad Católica de Chile, Santiago, Chile

Introduction

Renal hypoxia is recognized as an important factor in the pathogenesis of renal injury and chronic kidney disease (CKD). Renal hypoxia can be precipitated by a wide array of hormonal and hemodynamic factors. Sleep apnea syndrome (SAS) causes repeated bouts of hypoxemia, coupled with hemodynamic abnormalities and neurohormonal activation. Despite clinical correlations between sleep apnea and CKD few studies have addressed molecular pathways that may lead to CKD in patients with SAS. The aim of this study was to identify changes in renal gene expression associated with exposure to chronic intermittent hypoxia (CIH), a model of SAS. We hypothesized CIH would elicit increases in pro-inflammatory, pro-oxidative, and pro-fibrotic gene expression.

Methods

To address these hypotheses, we exposed rats to 10 days of CIH (or sham) and examined renal cortical expression of IL1ß, IL6, TNFa, Nrf-2, GCLC, NQO1, MnSOD, CuZSOD, P40phox, P67phox, SP1, CTGF, and Collagen III via qRT-PCR.

Results

Preliminary data suggests CIH results in upregulation of IL1ß, IL6, TNFa, Nrf-2, MnSOD, NQO1, GCLC, SP1, CTGF, and Collagen III mRNA in renal cortex.

Conclusion

These preliminary studies suggest that short term exposure to CIH is sufficient to promote induction of inflammation and pro-fibrotic genes, and adaptive expression of antioxidant defense programs. Further study is required to more clearly delineate the links between CIH and activation of these gene programs in the kidneys. A better understanding of the molecular pathways activated by CIH is important for understanding CKD pathophysiology in patients with SAS and related pathology such as the cardio-renal syndrome in heart failure.

KENTUCKY POSTER FINALIST - RESEARCH Alexandra E Stanback

Mass spectrometry imaging of N-glycans identifies racial disparities in human prostate tumors

Title

Mass spectrometry imaging of N-glycans identifies racial disparities in human prostate tumors

Authors

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Introduction

Prostate cancer is the most commonly diagnosed cancer in men worldwide. A critical knowledge gap in prostate cancer biology is the molecular events underlining higher incidence and mortality rate in Black men. Identifying molecular features that separate racial disparities is a critical step in prostate cancer research that could lead to predictive biomarkers and personalized therapy. N-linked glycosylation is a required co-translational event during protein folding that modulates many biological processes, such as cell adhesion, immune modulation, cell-matrix interactions, and cell proliferation. Recently, aberrant N-linked glycosylation has been reported in prostate cancers. However, the full clinical implications of dysregulated glycosylation in prostate cancer has yet to be explored.

Methods

Matrix-assisted laser desorption/ionization-mass spectrometry imaging (MALDI-MSI) is a new and innovative technique that combines mass spectrometry with imaging, enabling the detection of glycans with spatial distribution. Herein, we performed MALDI-MSI analysis to characterize the N-glycan profile from tissue microarrays of over 100 patient tumors banked at the University of Kentucky with over 10 years of follow-up data. Additionally, we performed MALDI-MSI analysis on large sections of prostate cancer to define the regional distribution of N-glycans within the tumor microenvironment.

Results

We successfully identified 46 unique glycans from readily available formalin-fixed paraffin-embedded prostate tissue and found significant N-glycan dysregulation between benign and prostate tumor tissue across all patient groups. High mannose as well as tri- and tetra-antennary N-glycans were predominantly found in tumor tissue and correlate with increased tumor grade. Surprisingly, several species of N-glycans were profoundly different between early grade prostate tumors resected from White and Black patients. Further, these glycans predict opposing overall survival between White and Black patients with prostate cancer.

Conclusion

These data suggest differential N-linked glycosylation underline the racial disparity of prostate cancer prognosis. Our study highlights the potential clinical applications of MALDI-MSI for digital pathology and biomarker applications and reveals molecular features that contribute to the racial disparity in diagnosis and survival of prostate cancer patients.

LOUISIANA POSTER FINALIST - RESEARCH Bradley J Powers

Factors associated with steroid injection utilization in knee osteoarthritis patients

Title

Factors associated with steroid injection utilization in knee osteoarthritis patients

Authors

Bradley Powers, Mariana Tumminello, Morgan Brown, Tyler White MD, Claudia Leonardi PhD, Amy Bronstone PhD, Vinod Dasa MD

Introduction

Among the various non-surgical treatments for early knee osteoarthritis, intra-articular steroids injections are used to relieve pain and delay total knee arthroscopy [1]. Two systematic reviews published in 2009 showed that intra-articular steroid injections are effective in reducing pain from knee osteoarthritis [2, 3]. Factors associated with selection of steroid injection instead of, or in addition to, other non-operative treatment options have not been studied. This study's objective was to identify factors associated with utilization of intra-articular (IA) steroid injections in patients with newly diagnosed knee osteoarthritis (OA).

Methods

A retrospective chart review of patients from an academic tertiary care center was conducted and claims data associated with the clinic visits was analyzed. A total of 761 patients were newly diagnosed with knee OA from 2015 to 2017 and did not undergo total knee arthroplasty during a median follow-up of 3.8 years (2.6-5.6 years). Patients most commonly were insured by Medicaid (39%) following by private insurance (32%), Medicare Advantage (18%), and Medicare (11%). Patients were predominately female (69.9%), African American (49.7%), and had a Kellgren-Lawrence (KL) grade of 4 (66.8%). The average age was 60 years and an average Knee Osteoarthritis and Outcomes Score (KOOS) Pain subscale score of 37.1.

Results

During follow-up, 29.4% did not have any IA steroid injections, 34.7% had one injection, and 35.9% had >1 injections. Among patients with KL score of 4, 21.5 % had no IA steroid injections, 41.5% had one injection, and 37.0 % had >1 injection during follow-up. A significantly greater proportion of women received steroid injections over men (72.5% vs 60.2%, p=0.016). Also, women received more steroid injections per year during their follow-up period (0.74 per year vs 0.57, p=0.014) as seen in Table 1. However, when adjusted for radiographic severity, a similar

proportion of women and men received steroid injections (87.6% vs 80.6%, p=0.073) although women received more injections per year during follow-up (0.64 vs 0.477, p=0.009) (Table 2). There was no difference in utilization between races and insurance types (p>0.05). Patients with a higher KL grade received more steroid injections (p=0.0001) but did not receive more injections per year (p=0.302).

Conclusion

More than 70% of patients tried intra-articular steroid injections to relieve their newly diagnosed knee OA pain. Previous studies suggest that women have a higher prevalence and report worse pain scores from knee OA [4, 5]. In our patient population, more women tried steroid injections and received more per year during follow-up especially in patients with radiographic evidence of early knee OA. Although the difference in proportion decreases with increasing radiographic severity, women with severe OA receive more injections per year. This may be attributable to a difference in disease onset or progression of disease but requires further investigation. Lastly, this project shows that patients with increasing severity of knee OA initially chose steroid injections more often; however, there was no difference in injections per year possibly signifying that steroid injections lose their effectiveness over time.

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MARYLAND POSTER FINALIST - RESEARCH Chaoyang Wang

THE IMPACT OF INTERMEDIATE TITER ANTIBODIES TO ADALIMUMAB (ATA) AND INFLIXIMAB (ATI) ON CLINICAL OUTCOMES IN PATIENTS WITH CROHN'S DISEASE (CD) OR ULCERATIVE COLITIS (UC)

Title

THE IMPACT OF INTERMEDIATE TITER ANTIBODIES TO ADALIMUMAB (ATA) AND INFLIXIMAB (ATI) ON CLINICAL OUTCOMES IN PATIENTS WITH CROHN'S DISEASE (CD) OR ULCERATIVE COLITIS (UC)

Authors

Chaoyang Wang, Mazen Tolaymat, Raymond K. Cross

Introduction

Anti-TNF drugs, adalimumab (ADA) and infliximab (IFX), are effective treatments for ulcerative colitis (UC) and Crohn's disease (CD). However, 30% of patients do not respond to treatment (primary non-response) and 40% lose response over time (loss of response). Loss of response is often due to development of antibodies to ADA (ATA) and IFX (ATI). While it is known that undetectable or low ATA/ATI titers (1000 ng/mL) are associated with poor outcomes, the significance of intermediate ATA/ATI titers (200-999 ng/mL) is not well understood. This study aims to investigate the impact of intermediate ATA/ATI titers on outcomes in CD and UC patients.

Methods

A retrospective chart review was conducted on CD and UC patients to determine associations between intermediate ATA/ATI titers and adverse clinical outcomes. The primary clinical outcome of interest is persistence on anti-TNF therapy 1 year after measurement of ATA/ATI titers. Secondary clinical outcomes of interest include clinical response to therapy 1 year after measurement of ATA/ATI titers. Participants consist of UC or CD patients treated with IFX or ADA at the University of Maryland IBD Program between October 2016 and October 2019 that had at least one measurement of ADA/ IFX and ATA/ATI during the study period.

Results

376 patients were identified (ADA=157 and IFX=219). 271 of 322 low titer patients persisted on their original anti-TNF compared to 9 of 15 intermediate titer patients (p=0.026) and 1 of 10 high titer patients (p

Conclusion

Patients with intermediate titers were more likely than patients with low titers to lose response to anti-TNF and require a change anti-TNF therapy. Although our sample size of patients with intermediate titers was small, providers should consider dose optimization of anti-TNF with or without addition of an immune suppressant when intermediate titers are present. An alternative approach would be to repeat drug and antidrug antibody levels to assess for worsening pharmacokinetics.

MASSACHUSETTS POSTER FINALIST - RESEARCH Daniel Finch

Comparative Performance of For-Profit and Nonprofit Nursing Homes during the COVID-19 Pandemic

Title

Comparative Performance of For-Profit and Nonprofit Nursing Homes during the COVID-19 Pandemic

Authors

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Introduction

The COVID-19 pandemic has disproportionally impacted elderly inhabitants of nursing homes (NHs) in the U.S. Despite constituting less than 1% of the U.S. population, nearly 40% of American COVID-19 related deaths have occurred among this vulnerable population.[1] Prior research suggests that facility characteristics such as staffing,[2] crowding,[3] and quality ranking[4] may contribute to NH COVID-19 outcomes. While a prior study has shown an association between NH profit status and COVID-19 mortality and caseload in Canada,[5] earlier studies relying on regional U.S. data are mixed.[6–11] This study provides an updated understanding of NH profit status on COVID-19 outcomes using recent COVID-19 data.

Methods

Primary outcomes of interest include cumulative (through 11/15/2020) COVID-19 cases and mortality, and primary exposure includes profit status. We gathered outcome data using the Centers for Medicare and Medicaid Services (CMS) COVID-19 Nursing Home Database,[12] a federally mandated weekly survey of all federally qualified NHs. Facility characteristics, including profit status, were obtained from the National Institute of Aging's LTCFocus.org database[13] and the CMS 2020 Nursing Home Compare database.[14] County information was obtained from the USAFacts Dashboard.[15]

We computed summary statistics to compare NHs by profit status using t-tests for continuous variables and chi-squared tests for categorical variables. We then created multivariable linear regression models using the above primary outcomes and exposure variables. We included

quality ratings, Medicare and Medicaid payment mix, chain affiliation, resident acuity index, percent white, percent female, presence of a physician extender, percent occupancy, average resident volume, county population, and county case rates in the adjusted models. The analysis was repeated with the subset of NHs that had at least one case or one death as a sensitivity analysis. Analyses were performed using R 4.0.3. Per institutional policy, IRB approval is not required for publicly available data.

Results

Of the included 14,266 NHs, 10,043 (70.4%) were for-profit. For-profit NHs had lower overall, health inspection, quality measure, and staffing ratings. They had more residents, higher percentage Medicare, higher acuity index, high percentage chain affiliation, and lower percentage white and female. For-profits were less likely to have staff shortages and were in counties with higher case rates (all comparisons $p<0.001$).

For-profits averaged more cases (36.6 vs. 27.9) and deaths (5.08 [95%CI=4.91-5.24] vs. 4.13 [3.87-4.39]) than nonprofits on unadjusted comparisons. Similarly, when adjusted for covariates, for-profits averaged more cases (34.1 [33.3-34.9] vs. 29.8 [28.6-31.1]) and deaths (5.00 [4.81-5.17] vs. 4.24 [3.97-4.51]) (all comparisons $p<0.001$). These comparative differences are similar when comparing only NHs with at least one case or death.

Conclusion

This national comparison of U.S. for-profit and nonprofit NHs suggests for-profit status is associated with more COVID-19 related cases and deaths, in line with previous work conducted in Canadian contexts.[5] These findings stand in contrast to findings from earlier, regional U.S. studies and may inform policy decisions surrounding care for vulnerable elderly populations.[6–8,10,11] Limitations include the inability to draw causal inferences due to the cross-sectional nature of the data and reliance on facility-reported COVID-19 case and death counts.

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MASSACHUSETTS POSTER FINALIST - RESEARCH Benjamin Pockros

National Healthcare Expenditures and Cost of Dialysis: Evaluation of a Single Payer System in the United States

Title

National Healthcare Expenditures and Cost of Dialysis: Evaluation of a Single Payer System in the United States

Authors

Benjamin M. Pockros; Daniel J. Finch; Daniel E. Weiner, MD.

Introduction

The U.S. spends more on healthcare than every other country in the world. One possible benefit of a single-payer system is a potential reduction in total healthcare costs. However, examining this assumption within the United States is challenging because of the complicated multi-payer system. Maintenance dialysis represents a unique health system in the U.S. because most patients treated with dialysis, regardless of age, are insured by Medicare. In 2018, approximately 85% of 554,000 dialysis patients in the U.S. were insured by Medicare as primary coverage. Therefore, outpatient dialysis in the U.S. is, in effect, a current robust single-payer system. The purpose of this study was to examine if the relatively high cost of healthcare in the U.S. remains true for dialysis, given its unique near single-payer infrastructure.

Methods

Hemodialysis (HD) reimbursement data was derived from a previously published cross-sectional survey of international nephrologists. Nephrologists from 81 countries estimated the hospital reimbursement fee for a single HD session. Healthcare expenditure data, stratified by GDP per capita in 2017, was collected from the World Health Organization Global Health Expenditure Database. The association between the cost of dialysis and a country's healthcare expenditure (excluding the U.S.) was calculated using a Pearson correlation test and fit to a univaritate linear regression model to predict the expected cost of dialysis in the U.S. This projected cost was examined in relation to the actual cost of dialysis in the U.S., which was derived from the Medicare PPS 2020 Final Rule. Analyses were conducted using R, version 3.6.0. and statistical significance was set at P

Results

Our analysis shows a strong correlation between a country's cost of dialysis per patient and its healthcare expenditure per GDP per capita (Pearson r=0.92). Using this model, the predicted annual cost of dialysis in the U.S. is $101,385 (95% PI $82,490-$120,279). The Medicare base facility fee per treatment session in 2020 was $239.33. Given 156 sessions per year and supervising physician reimbursement of approximately $240 per month per dialysis patient, the actual annual cost per patient is approximately $40,215, meaningfully lower than predicted.

Conclusion

This study demonstrates the annual cost of dialysis per patient in the U.S. is $60,000 below its predicted cost. Considering the large population of HD patients in the U.S., this equates to more than $28 billion in cost savings each year. Given the extensive difference in cost compared to typical healthcare expenditures in the U.S., it is possible these findings may relate to the effects of a quasi-single-payer system controlling the rate of reimbursement. A single-payer system may have a strong influence over cost containment because dialysis facilities have less bargaining capabilities against a large homogenous payer, such as Medicare. Our results suggest that a single payer infrastructure can contribute to cost containment, a clear advantage of this system. Potential disadvantages of this policy, such as a lack of innovation and investment to advance dialysis practices, require further analysis.

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MASSACHUSETTS POSTER FINALIST - RESEARCH Adam Sonnenberg

A Markov chain model of particle deposition in the lung

Title

A Markov chain model of particle deposition in the lung

Authors

Adam H. Sonnenberg, Jacob Herrmann, Mark W. Grinstaff & Béla Suki

Introduction

Particle deposition in the lung during inhalation is of interest to a wide range of biomedical sciences due to the noninvasive therapeutic route to deliver drugs to the lung and other organs via the blood stream. Before reaching the alveoli, particles must transverse the bifurcating network of airways. Computational fluid mechanical studies are often used to estimate high-fidelity flow patterns through the large conducting airways, but there is a need for reduced-dimensional modeling that enables rapid parameter optimization while accommodating the complete airway network. Here, we introduce a Markov chain model with each state corresponding to an airway segment in which a particle may be located. The local flows and transition probabilities of the Markov chain, verified against computational fluid dynamics simulations, indicate that the independent effects of three fundamental forces (gravity, fluid drag, diffusion) provide a sufficient approximation of overall particle behavior. The model enables fast computation of how different inhalation strategies, called flow policies, determine total particle escape rates and local particle deposition. In a 3-dimensional airway tree model, the optimal flow policy minimizing the risk of deposition at each generation, compared to other inlet flow waveforms, predicted significantly higher probability of escape defined as the fraction of particles exiting the tree.

Methods

In order to turn the deposition problem into an optimization problem, a Markov chain model of particle transport and deposition in a bifurcating structure mimicking the human airway tree was implemented. The Markov chain consists of states connected according to the known bifurcation topology of the airway structure. A particle is considered to be in a particular state when it is located within the corresponding airway segment, either suspended in the fluid flow through the airway lumen or deposited onto the airway wall. The transition probabilities between allowed states are defined below.

Results

As the micron-sized particles move deeper into the airway tree, the flow rate decreases faster than the diameter, and thus larger flow rates can be applied without the risk of inertial impaction. Thus, a ramp-up policy involving low flow rates in the beginning while particles traverse the first few generations, followed by increasing flow rates as particles traverse the peripheral airways, appears to maximize the probability of escape into the alveolar space. However, certain airways possess lower optimal flow rates than other airways of the same generation number, depending on alignment with the gravitational field.

Conclusion

We introduced a novel discrete time Markov chain model that simulates particle deposition in a realistic 3D model of the airway tree. We also propose a general formulation for calculating capture chance for any given segment in the airway structure. For a given flow policy, the probability that particles escape the airway tree and deposit in the alveoli was computed. As such this model, which is facile to implement and flexible to accommodate new features, provides an efficient tool for studying deposition to gain insight into ventilation strategies for targeted drug delivery in the healthy and diseased lung.

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https://www.nature.com/articles/s41598-020-70171-2

MICHIGAN POSTER FINALIST - RESEARCH Jonathan Dokter

Outcomes of High-dose Intravenous Vitamin C for the Treatment of Severe COVID-19: A Retrospective Inverse Probability Treatment Weighting Propensity Score Methodology

Title

Outcomes of High-dose Intravenous Vitamin C for the Treatment of Severe COVID-19: A Retrospective Inverse Probability Treatment Weighting Propensity Score Methodology

Authors

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Introduction

Intravenous Vitamin C (IV-VitC) has recently been suggested as a treatment modality for severe sepsis and acute respiratory distress syndrome (ARDS); however, there are no studies evaluating its use for patients with severe COVID-19. The goal of this study was to describe our findings utilizing high-dose IV-VitC treatment in the setting of severe COVID-19 infection.

Methods

This retrospective cohort study compared the outcomes of COVID-19 patients admitted to a community hospital in Michigan between March and June 2020. All COVID-19 patients with severe disease, defined as an oxygenation index (PaO2/FIO2 ratio) < 300, were included in the study. Patients were then divided into two groups, those who received IV-VitC and those who did not. The IV-VitC treatment was given for 7 consecutive days at a dose of 3 grams every 6 hours. Our primary outcomes included intensive care unit (ICU) admission, mechanical ventilation, and death. Our secondary outcomes included ICU length of stay (LOS), time on ventilation, requirement of vasopressors, development of ARDS, development of acute kidney injury (AKI), time to death, and cardiac arrest. In addition to univariate analysis, inverse probability treatment weighting (IPTW) propensity score methodology was used.

Results

A total of 100 patients were included in this study, with 25 patients receiving IV-VitC. The average age of patients enrolled in the study was 68 years of age and the majority of patients were male (55.00%) and white or Caucasian (57.00%). The overall ICU admission rate was 85% (85/100), and 72% (72/100) of all patients required mechanical ventilation. The rate of death was 47% (47/100), with an average time to death from admission of 15.66 days. In the univariate analysis, IV-VitC was associated with 86% lower odds of developing ARDS as compared to control patients (OR: 0.14; P = 0.0313). The average time to death was 22.90 days for IV-VitC patients compared to 13.70 days for the control patients (P = 0.0207). From the IPTW outcome models, the IV-VitC group had significantly lower adjusted rates of mechanical ventilation (52.93% vs. 73.14%; ORIPTW = 0.27; P = 0.0499). There also were significantly lower adjusted rates of ARDS (72.53% vs. 92.34%; ORIPTW = 0.03; P = 0.0327) as well as cardiac arrest (2.46% vs. 9.06%; ORIPTW = 0.23; P = 0.0439) in the IV-VitC group. Subgroup analysis in patients with chronic kidney disease (CKD) showed that IV-VitC patients had 97% lower odds of ICU admission and 99% lower odds of ARDS than the control group (OR:0.03; p=0.0198 and OR:0.01;p=0.0016 respectively).

Conclusion

Utilizing IPTW methodology we were able to identify that high-dose IV-VitC may be an effective treatment in decreasing the need for mechanical ventilation and ARDS development for severe COVID-19 patients and in decreasing the need for ICU admission and ARDS development in COVID-19 patients with concomitant CKD. Despite the limitations of this retrospective cohort study, these results may guide future randomized clinical trials to examine the effect of IV-VitC treatment on COVID-19 patient outcomes.

MINNESOTA POSTER FINALIST - RESEARCH Sweta Bhoopatiraju

Granulocyte Colony Stimulating Factor is Safe and Well Tolerated by Patients with Sickle Cell Disease Following Hematopoietic Stem Cell Transplantation

Title

Granulocyte Colony Stimulating Factor is Safe and Well Tolerated by Patients with Sickle Cell Disease Following Hematopoietic Stem Cell Transplantation

Authors

Sweta Bhoopatiraju, Niketa Shah, Shalini Shenoy

Introduction

Granulocyte colony stimulating factor (G-CSF) is a hematopoietic growth factor that accelerates neutrophil recovery by stimulating proliferation after hematopoietic stem cell transplantation (HCT). It is used to offset neutropenia related infections. However, G-CSF is contraindicated in sickle cell disease (SCD) due to life-threatening vaso-occlusion related complications triggered by neutrophil proliferation. The safety of G-CSF following transplant in patients with SCD is unknown.

Methods

Outcomes of G-CSF administration following allogeneic HCT were evaluated retrospectively in SCD patients who were enrolled on a multicenter trial, receiving reduced intensity conditioning (RIC) and G-CSF per protocol. Sixty-four SCD patients of median age 10.6 years (range 1-21) underwent HCT from the best available donor following RIC. G-CSF was commenced on day +7 post HCT intravenously at a dose of 5 mcg/kg/day and continued until the absolute neutrophil count (ANC) was >1500/cumm x 3. The clinical course, outcomes, and toxicities in the first 100 days post-HCT were evaluated as best representing the period of G-CSF influence on SCD recipients. Data extracted included demographics, duration of G-CSF, time to neutrophil (ANC >500) and platelet (>50,000/cumm unsupported) recovery, chimerism, incidence of graft versus host disease, infections, immune reconstitution, and organ toxicities.

Results

G-CSF was administered for a median of 9.4 days (range, 6-33). The ANC recovered at a median of 14 days (range, 10-38). Platelets engrafted at a median of 25 days (range, 12-89). Three

patients recovered platelets after day 100. Seven patients had primary graft rejection and autologous reconstitution of hematopoiesis. Chimerism analysis on day 100 in the remaining patients included a median of 93% in the myeloid lineage (range 41-100%; N=30), 89% in the lymphoid lineage (range 26-100%; N=36) and 93% in whole blood (range 48-100%; N=45). A total of 23 episodes of hematologic and 7 extra-hematologic sites of bacterial infection were observed in 22 patients. All recovered without complications. Organ toxicities were noted in 17 of the 64 patients, most commonly hypertension and renal dysfunction, and were expected as part of the transplant process. No patient developed SCD related symptoms.

Conclusion

We conclude that G-CSF is well tolerated by SCD patients following HCT. There were no toxicities attributed to G-CSF and no G-CSF related mortality. G-CSF is not contraindicated in SCD patients and may help shorten the period of neutropenia post HCT. The absence of circulating sickle hemoglobin is a potential reason for the absence of complications despite persistent vasculopathy.

MISSOURI POSTER FINALIST - RESEARCH Cynthia Tang

Assessing the clinical, epidemiological, and molecular implications of SARS-CoV-2 in Missouri

Title

Assessing the clinical, epidemiological, and molecular implications of SARS-CoV-2 in Missouri

Authors

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Introduction

Since its emergence, the SARS-CoV-2 causing the ongoing COVID-19 pandemic has undergone rapid genetic evolution[1], and new properties regarding the epidemiological and clinical aspects of this disease have been reported over the past 11 months. While the mutation D614G of the spike protein was shown to enhance viral transmission[2,3], this mutation cannot explain the patterns of virus emergence and transmission in Missouri. The objective of this study is to understand how SARS-CoV-2 emerged and spread by integrating clinical, epidemiological, and genetic data, and by Bayesian phylodynamic and geospatial analyses.

Methods

Nasopharyngeal swab samples were collected from 323 Missouri zip codes during hospitalizations, clinical visits, or drive-throughs to diagnose COVID-19. Metadata including age, gender, and zip code were collected for all samples. Additional patient demographics, selected comorbidities, symptoms, and hospitalization status were extracted from EMR chart review. This study was approved by the IRB. The viral load in each sample was quantified through quantitative reverse-transcriptase PCR, and the positive result was determined based on the criteria defined by CDC. Viral genomes were sequenced using Illumina MiSeq, and assembly, polymorphisms, mutation analyses were performed by CLC Genomics Workbench. Bayesian phylodynamic analyses were performed by BEAST, positive selection by PAML, and geospatial analyses by Tableau.

Results

Samples from every county in the State were analyzed. Initial inclusion criteria involved positive COVID-19 test and availability of cycle threshold (Ct) values to analyze overall scope and trends. Based on the 8,735 analyzed patients, significantly increased viral shedding per patient was observed after May, corresponding to Missouri's stay-at-home order ending and expanded widespread testing. Chart reviews were conducted on 175 patients including 164 adult and 11 pediatric patients of which 76.6% were white. Of the 13 hospitalized patients, one died due to COVID-19. Among the 175 patients, hospitalized patients were significantly older (mean age: 54.5 years, SD=11.5 vs. 34.3 years, SD=16.0) and had at least one comorbidity (100% vs. 40.8%) compared to non-hospitalized patients. Phylogenetic analyses revealed multiple local and global introductions of the virus into the state. Successful sequencing of 141 samples collected from the same 175 patients yielded 374 amino acid mutations comprising 3 clades and 22 subclades. Of these, 4 mutation clusters were unique to Missouri. Evolutionary pressure analysis revealed that the Envelope and ORF3a proteins of SARS-CoV-2 are undergoing positive selection.

Conclusion

This study integrates clinical, molecular, and epidemiological analyses to generate a more complete understanding of SARS-CoV-2. We show a significant increase in viral shedding and, thus, a potentially more efficient transmission spread. Through genetic analyses, we demonstrate multiple viral introductions into and across the state, numerous mutations once the virus has entered the state, and evolutionary pressure within the Envelope and ORF3a proteins. The clinical demographics and descriptive findings complement previously published studies, suggesting confidence that these data are generalizable to the global population. Limitations include little racial variation and relatively low number of hospitalizations in the 175 patients. Further studies combining epidemiological and genetic aspects can help guide future policymaking and response to viral mutations.

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NEVADA POSTER FINALIST - RESEARCH Justin S Bauzon

Using Macros in Microsoft Excel to Facilitate Chart Review Data Acquisition

Title

Using Macros in Microsoft Excel to Facilitate Chart Review Data Acquisition

Authors

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Introduction

Retrospective studies that rely on manual chart review may be delayed by lack of support from an informatics service or specific tools that can cleanly export clinical data from the electronic medical record. This places the burden of abstracting and organizing data on the investigator. Microsoft Excel “macros” are pre-programmed procedures that could potentially be useful for streamlining such a task.

Methods

Using an intrinsic electronic medical record function, certain vital signs and lab results from individual hospitalizations were exported into spreadsheets. Two macros were developed to clean these datasets (ex., remove blank cells and standardize formatting) and output them into a format conducive to statistical analysis. The speed of macro-applied data sorting was compared to manual transcription. In total, 1276 separate clinical data points (1059 vital signs and 217 laboratory tests) from 20 hospitalizations were sorted by both methods. Times required for each method were compared with Student’s t-test.

Results

Time spent on data extraction was significantly reduced when using macro-assisted sorting compared to the manual approach for both vital signs (46.5 seconds versus 12.3 minutes per hospitalization; 94% reduction, $P < 0.001$) and laboratory tests (13.7 seconds versus 2.6 minutes per hospitalization; 91% reduction, $P < 0.001$).

Conclusion

Macros offer a flexible and efficient tool cleaning and organizing large datasets, particularly when an institution's central data repository is inaccessible or lacks the exporting functions conducive to productive data extraction.

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NEW HAMPSHIRE POSTER FINALIST - RESEARCH Christina Tsai

Preliminary Data from Evaluating the Viability of a Discharge Clinic with Telemedicine in a Rural Academic General Internal Medicine Clinic

Title

Preliminary Data from Evaluating the Viability of a Discharge Clinic with Telemedicine in a Rural Academic General Internal Medicine Clinic

Authors

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Introduction

Medicare and Medicaid discharge data from Dartmouth-Hitchcock Medical Center (DHMC) in Lebanon, New Hampshire showed that from 2015 to 2017, the percentage of patients completing ambulatory clinic visits within 14 days of hospital discharge decreased approximately 45% and emergency department encounters within 30 days of discharge increased approximately 18%. Rates of primary care physician follow-ups within 14 days of discharge and readmission rates within 30 days remained stable. Data from 2019 demonstrated that 80% of scheduled hospital check visits at DHMC's General Internal Medicine Clinic were for patients discharged from the hospital medicine service, with a visit non-completion rate of 20%. With the COVID-19 pandemic ushering in reimbursement of telehealth visits, telemedicine can potentially be utilized in capturing those who desire increased scheduling flexibility or decreased travel time. We hypothesized that creating a discharge clinic could improve follow-up care at DHMC, and that our rural patient population may benefit from offering a telehealth option.

Methods

Patients discharged from DHMC's hospital medicine service in a two-month period were called to participate in a voluntary phone survey regarding their follow-up after discharge. Interest in and ability to participate in telemedicine visits were also assessed. Patients were excluded from the phone survey if they were under age 18, did not speak English, admitted to a rehab or skilled nursing facility, or discharged from a different primary service. Survey data was collected

in REDCap and analyzed through routine simple counts, Fisher exact test, and multivariate logistic regression.

Results

A total of 29 survey responses were collected (16 male, 13 female), with around half (48%) of survey participants older than age 65. Patients commuted a range of travel times to reach DHMC, with 38% (11/29) reporting less than 30 minutes, 21% (6/29) between 30 minutes to 1 hour, 34% (10/29) between 1-2 hours, and 7% (2/29) more than 2 hours. 27.5% (8/29) of patients surveyed did not complete a follow-up appointment within two weeks of discharge, with the most common reason being that they did not know one was needed. 40% (12/29) would prefer a telemedicine over in-person clinic visit, and there was no difference in preference based on patient demographics. 46% (12/26) did not have a preference between following up with their usual PCP compared to a DHMC provider. The majority of patients had access to cell service (86%) and Wifi or internet (86%) at home. All patients regularly used either a cell phone, smartphone, computer, or tablet with internet connectivity. 48% (14/29) used the internet on their own, and 17% (5/29) used the internet with assistance. Several had previously participated in video conferences or calls either on their own (34%) or with assistance (28%). 59% (17/29) had completed a previous telehealth visit by survey administration. No statistically significant correlations were found between variables.

Conclusion

Establishing a discharge clinic at DHMC could be viable and incorporating telehealth visits would be a valuable service for recently discharged patients in our region. More survey data needs to be collected for statistically significant analysis.

NEW JERSEY POSTER FINALIST - RESEARCH Anurag Modak

An Inverse Association Between Serum Estradiol and Leg Adiposity in Female U.S. Adults

Title

An Inverse Association Between Serum Estradiol and Leg Adiposity in Female U.S. Adults

Authors

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Introduction

Several studies have shown an inverse association between leg adiposity and cardiometabolic conditions (1–6); however, little is known about the underlying factors associated with increased leg adiposity. We sought to determine if serum sex hormone levels were independently associated with leg adiposity using the nationally representative 2013-2016 National Health and Nutrition Examination Survey (NHANES).

Methods

The cross-sectional study included 4,902 non-pregnant adults aged 20-59 who were not taking exogenous steroids. The data were first stratified by sex. Serum testosterone, serum estradiol, and testosterone/estradiol ratio (TER) were divided into sex-specific quartiles. The outcome variable was leg adiposity, which was measured via dual-energy X-ray absorptiometry scans and tabulated as percent leg fat of total leg mass (LFLP), percent leg fat of total body fat (LFTP), and lean leg mass to fatty leg mass ratio (LFR). Elevated leg adiposity was defined as LFLP≥27%, LFTP≥34%, or LFR≥2.59 for males and as LFLP≥43%, LFTP≥39%, or LFR≥1.25 for females. We estimated odds ratios using multivariable logistic regression, adjusting for covariates (age, race/ethnicity, serum triglycerides, serum HDL cholesterol, poverty-income ratio, BMI, waist circumference, impaired glucose tolerance, hypertension, liver enzymes, physical activity, and alcohol consumption) and accounting for the complex survey design.

Results

Among the 4,902 participants, 2,214 (54.1%) were female. Among females, there was a dose-dependent increase in LFR with increasing serum estradiol; the highest quartile (≥116 pg/mL) had 89% greater odds (aOR [95% CI]: 1.89 [1.34, 2.67]), the third quartile (51.1-116 pg/mL) had 71% greater odds (1.71 [1.20, 2.44]), and the second quartile (15.2-51.1 pg/mL) had 56% greater odds (1.56 [1.11, 2.19]) than the lowest quartile (<15.2 pg/mL). Among females, there was also a dose-dependent decrease in LFLP with increasing serum estradiol; the highest quartile had 46% lower odds (0.54 [0.39, 0.76]), the third quartile had 39% lower odds (0.61 [0.44, 0.87]), and the second quartile had 34% lower odds (0.66 [0.47, 0.92]) than the lowest quartile. Among females, the highest estradiol quartile had 36% lower odds (0.64 [0.42, 0.97]) of having elevated LFTP than the lowest quartile and the third testosterone quartile (21.4-29.5 ng/dL) had 42% greater odds (1.42 [1.02, 1.98]) of having elevated LFTP than the lowest quartile (<14.9 ng/dL). Among females, the highest TER quartile (≥1.35) had 79% greater odds (1.79 [1.18, 2.71]) of having elevated LFTP, 50% lower odds (0.50 [0.35, 0.71]) of having elevated LFR, and 93% greater odds (1.93 [1.36, 2.75]) of having elevated LFLP than the lowest quartile (<0.20). Among males, the highest TER quartile (≥23.5) had 39% lower odds (0.61 [0.39, 0.95]) and the third quartile (18.1-23.5) had 40% lower odds (0.60 [0.41, 0.88]) of having elevated LFLP than the lowest quartile (<13.8). Among males, the third TER quartile also had 66% greater odds (1.66 [1.13, 2.44]) of having elevated LFR than the lowest quartile.

Conclusion

Among females, serum estradiol was independently, positively associated with the lean leg mass to fatty leg mass ratio and independently, inversely associated with leg fat as percentage of total leg mass. Testosterone did not exhibit any independent, dose-dependent relationships with leg adiposity for either sex.

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NEW YORK POSTER FINALIST - RESEARCH Caitlyn Coady

Patient Perspectives on Televideo in Upstate New York

Title

Patient Perspectives on Televideo in Upstate New York

Authors

Caitlyn Coady, BFA, Anusha Agarwal, BS, James Desemone, MD, FACP, CPE

Introduction

Due to its widespread human-to-human transmission and associated mortality rates across the world, the SARS-CoV-2 pandemic has impacted many aspects of the healthcare system, including delivery of care. With physical distancing orders in place, Albany Medical Center integrated telemedicine options for the outpatients it serves. With the sudden shift in patient-care structure, it was important to rapidly assess the effectiveness of this new virtual care system from the perspective of the patient. Additionally, this presented a unique opportunity to assess televideo across all medical specialties, which has not yet been published in peer-reviewed literature. In so doing, interventions could be introduced rapidly to enhance the patient care experience. The aim of our study is to analyze the perception of care by patients who attended a televideo appointment with an outpatient clinician. We hypothesized that more than 50% of those patients would have a positive experience and would not be opposed to attending more televideo visits in the future.

Methods

We published a 13 question survey on the Qualtrics® platform that addressed the patient's perception of care after attending a televideo appointment with a clinician of the Albany Med Physician Group practice. We included patients >18 years of age and excluded patients seen by psychiatry and pediatrics. From July 7, 2020 to Nov 2, 2020, survey links were emailed to all eligible patients the day after their televideo appointment and data were analyzed by the authors.

Results

677 patients were emailed a link to the Qualtrics® survey. 116 responses were collected (completion rate: 17.13%). The demographic breakdown of those who responded was as follows: 76 females (65.5%), 38 males (32.76%); 71 patients were age 65 years or older (61.2%); 62 (53.44%) reported having a travel time of 30 minutes or greater and 16 (13.79%) reported

having a travel time greater than 2 hours. 107 patients (92.24%) reported that their primary medical concern was addressed, with 87 patients (75.0%) were “extremely satisfied” and 19 (16.38%) were “somewhat satisfied” with the telemedicine care they received. 55% of an initial 31 responses reported technical difficulties, which was identified as an audio glitch with the portal app. This was brought to the attention of faulty leadership and the audio malfunction was addressed. After this intervention, 28% of patients responding reported continued technical difficulties, which included issues with connecting, poor audio, and poor video quality. 83 patients (71.55%) were “extremely likely” to utilize telemedicine again.

Conclusion

Our data show the perception of care by the patients was high even though many experienced technical difficulties. The study revealed that over 50% of patients rated their experience as “extremely satisfied” which supports the continued use of televideo as an outpatient appointment option.

NEW YORK POSTER FINALIST - RESEARCH Perry Kerner

Factors Impacting Stress Levels in an Inner-City Population of CKD and Kidney Transplant Patients

Title

Factors Impacting Stress Levels in an Inner-City Population of CKD and Kidney Transplant Patients

Authors

Perry Kerner, Lawrence M. Langan, Michael A. Goldberg, Basim Ahmad, Alexander S. Imas, Lora Stoianova, Jannat Ara, Monica Saw-Aung, Mariana Markell, MD

Introduction

In light of the COVID-19 pandemic and its disproportionate impact on inner-city populations, as clinicians it is important to assess our patients' stress levels in order to improve mental health services.

Methods

The Perceived Stress Scale (PSS) instrument was administered to a random sample (N = 42) of inner-city chronic kidney disease (CKD) (13, 31%) and kidney transplant (KTx) (29, 69%) patients in summer 2020. Responses were recorded on a scale from 0-4 (never, almost never, sometimes, fairly often, very often). Total score was calculated by summing all subscores. Statistical analysis was performed on SPSS using t-test and Pearson r. Significance level was set at $p < / = 0.05$.

Results

CKD and KTx patients were combined for statistical analysis. Mean age was 59.0 ± 11.5 years. There were 20 (48%) men and 22 (52%) women with 28 (68.3%) black, 6 (14.6%) Hispanic, 3 (7.3%) white, 1 (2.4%) Asian, and 3 (7.3%) mixed/other. Mean number of household members including the patient was 2.9 ± 1.9, ranging from 1-12. 22 (52%) were born outside the US. 6 (14.3%) did not finish high school, 16 (38.1%) completed high school, 9 (21.4%) finished some college, 9 (21.4%) completed college, and 2 (4.8%) completed graduate school. KTx patients were younger than CKD patients ($p = 0.027$). There were no statistically significant differences between CKD and KTx patients with respect to gender, race, number of household members, birthplace (US vs. elsewhere), or education. There were no statistically significant differences in PSS subscores or total score between CKD and KTx patients. Age correlated inversely with

feeling “nervous and stressed” (r = -0.369, p = 0.016). Number of household members correlated directly with feeling “nervous and stressed” (r = 0.323, p = 0.037) and that “difficulties were piling up so high that you could not overcome them” (r = 0.312, p = 0.044) and inversely that “you were on top of things” (r = -0.315, p = 0.042). Patients born outside the US felt less “confident about your ability to handle your personal problems” (r = -0.367, p = 0.017) and less “able to control irritations in your life” (r = -0.330, p = 0.033). Education correlated inversely with feeling that “things were going your way” (r = -0.365, p = 0.017). Total PSS score correlated inversely with age (r = -0.371, p = 0.016) and directly with number of household members (r = 0.351, p = 0.023). There were no statistically significant differences in PSS subscores or total score with respect to gender or race.

Conclusion

In our population: 1) Individuals who were older were less stressed. 2) Individuals who lived in more crowded households were more stressed and overwhelmed in their day-to-day lives. 3) Individuals born outside the US felt less confident in their ability to control life stressors. 4) Individuals who were more educated were more pessimistic about their lives. 5) Given the increased psychosocial stress created by the pandemic, it is important to assess patients’ living situations and backgrounds in addressing their fears and concerns.

NEW YORK POSTER FINALIST - RESEARCH Cynthia Matsumura

Heightened perception of personal risk affects adherence to cancer screening within cancer caregivers of a primarily Hispanic inner-city community

Title

Heightened perception of personal risk affects adherence to cancer screening within cancer caregivers of a primarily Hispanic inner-city community

Authors

Cynthia Matsumura, Brieyona Reaves, Bruce Rapkin

Introduction

Providing support and care to family and friends affected by cancer has been associated with heightened awareness of risk and greater adherence to screening guidelines. However, in lower-income communities of color, poor cancer outcomes may lead caregivers to develop fatalistic beliefs about cancer. Increased stress associated with cancer caregiving may exacerbate personal health-risk behaviors, particularly if there is little expectation of meaningful help from the healthcare system. This study seeks to assess the impact of varying degrees of cancer caregiving on personal cancer preventive behavior and attitudes toward cancer.

Methods

Data were collected as part of an NCI supplement to the Albert Einstein Cancer Center to assess cancer screening and risk behavior in the inner-city population of Bronx, New York. A sample of 1430 patients (32% non-Hispanic Black, 21% non-Hispanic White, 43% Hispanic any race; age mean/SD= 50/15 years; 73% female) provided data on caregiving, cancer attitudes, and prevention and screening behavior. For analysis, we created a composite measure of adherence to prevention and screening guidelines based on the number of behaviors each person performed out of the total recommended for their age and sex.

Results

Four patterns of cancer caregiving were evident in this sample using K-means cluster analysis: no support (28%), emotional support only (18%), less intensive chores and personal tasks (18%), and more intensive tasks including help with housing and expenses (36%). More and Less Intensive groups (52 years) were older than Emotional Only (50 years) and No Support (46 years) (p**Conclusion**

In this diverse, inner-city sample, people who provided intensive support to cancer patients were most likely to adhere to age and gender-specific cancer and prevention screening recommendations. However, levels of adherence were suboptimal in all groups. Pessimism and attributing cancer to behavioral causes seemed to discourage screening in the No Support Group. Messaging that emphasizes hope and self-efficacy seem appropriate for this group. However, among 54% of people who had a direct role in caring for cancer patients, such messages may be ill-directed. Among some proportion of Hispanic and other caregivers, lack of adherence is associated with a heightened sense of personal cancer risk. Efforts to promote caregivers' health may need to address experiences that have contributed to an inordinately high sense of personal risk for cancer.

NEW YORK POSTER FINALIST - RESEARCH Michelle S Toker

Medical student outreach to patients with substance use disorders (SUD) during COVID-19

Title

Medical student outreach to patients with substance use disorders (SUD) during COVID-19

Authors

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Introduction

Patients with substance use disorders (SUD) experience health inequity as a result of structural factors such as low socioeconomic status, food insecurity, and housing instability (Galea and Vlahov, 2002). This patient population has also been disproportionately affected by the COVID-19 pandemic (Wang et al., 2020). In an effort to provide high value care, medical students from the Albert Einstein College of Medicine (AECOM) initiated a remote student volunteer helpline to assist overburdened clinical staff with addressing the non-clinical needs of their patients throughout the pandemic.

Methods

Student volunteers began by assembling a comprehensive resource guide that was distributed to providers at an urban health center that specializes in treating patients with opiate use disorder. Student volunteers then made flyers for distribution at this site, advertising the newly established helpline. Patients were recommended or referred by their clinical psychologists or counselors for various non-clinical services. These included applying for cell phones through the federal Lifeline Assistance program, applying for cooling assistance through the NYS Home Energy Assistance Program, locating food pantries and delivery services close to their location, and providing tech support for the newly established telehealth platform, Montefiore FIRST. When patients attended the clinic to receive their methadone prescription, they could call the student helpline from the clinic's phones. If patients already had a phone, students could reach out to them via the HIPAA-compliant Doximity dialer.

Results

The helpline operated for 12 weeks, during clinic hours (7 AM-3:30 PM), and spanned all 4 phases of NYC's coronavirus re-opening process. By July 2020, 11 medical student volunteers were recruited from all class years and assisted 38 patients who were either referred to, or contacted, the student helpline. Volunteers contributed over 500 cumulative hours. Phone calls with patients varied in length from a few minutes to over an hour, and the duration of contact with patients ranged from a single day to 6 weeks, during which we conducted follow-ups and confirmed receipt of services. Twenty-one patients had their original requests resolved. Of the remaining patients, 15 had ongoing requests, and 2 were not clinic patients and therefore ineligible for assistance. Patients with ongoing requests were transitioned to assistance from the clinic's certified recovery peer advocate.

Conclusion

This initiative provided medical students with a patient-focused approach to addiction medicine, as well as a more direct understanding of the numerous social challenges faced by patients with SUD, from limited technology literacy to difficulty navigating government assistance programs. We received positive feedback from patients that felt supported by the student volunteers and better connected during this period of growing isolation. Given this initial success, SUD clinics and the psychiatry clerkship at AECOM are currently working to continue and expand the program to involve more students and impact a broader population of patients. The resource guides created at the start of the program continue to be distributed by the clinic staff and are currently being used by the Einstein Community Health Outreach Free Clinic in support of their patients.

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NEW YORK POSTER FINALIST - RESEARCH Wen Ting Yang

Attitudes Toward ED Visits in Inner-city Patients During the COVID-19 Pandemic

Title

Attitudes Toward ED Visits in Inner-city Patients During the COVID-19 Pandemic

Authors

Wen Ting Yang, Basim Ahmad, Anna Lin, Michael A. Goldberg, Jannat Ara, Ryan M. Harrington, Gabrielle Estevez-Inoa, Mariana Markell, MD

Introduction

Concerns over COVID-19 may underlie reluctance to seek emergency care in the ED, which could have detrimental health consequences, especially in high-risk patients. We studied attitudes toward COVID-19 and ED visits in an inner-city patient population.

Methods

A telephone survey was conducted in a random sample of family medicine (36) and chronic kidney disease (17) patients. Patients were asked questions regarding attitudes toward COVID-19 and visiting the ED. The two groups were analyzed together as there were no differences between them. Analyses were performed using chi-square and t-test. P-value was set at p =0.05.

Results

Mean age was 64.51 ±10.62 years. There were 19 (36%) males and 34 (64%) females with 42 (86%) Black, 5 (10%) Hispanic, 2 (4%) Other. 13 (27%) did not complete high school. Most patients (78%) surveyed did not seek any emergency care during the pandemic. 5 (46%) sought emergency care in the ED during the pandemic. 29 (67%) reported they would go to the ED in the event of a medical emergency. 9 (21%) reported they would not go to the ED, with 11 (26%) feeling unsafe going to the ED. Patients who felt unsafe going to the ED were more likely to feel stressed around others (89% vs 40%, p = 0.04) and avoid others because they did not want to get sick (4.78 ±0.44 vs 3.73±1.27, p = 0.024). Patients who felt unsafe were also more likely to fear COVID-19 (4.82 ±0.41 vs 4.24±1.14, p = 0.045) and going to public areas (91% vs 53%, p = 0.042). They were less likely to go to the ED for a medical emergency (21% vs 75%, p = 0.01). Compared to those who felt safe going to the ED, patients who felt unsafe were more likely to respond “no” to going to the ED for extreme belly pain (55% vs 5%, p = 0.002). 9 (24%) patients expressed reluctance going to the ED for persistent fever. There were no statistically significant

differences in attitudes toward ED visits with respect to gender, age, and birthplace (US vs elsewhere).

Conclusion

In our population: 1. Most would seek emergency care in the ED and felt safe doing so. 2. However, a third expressed concerns going to the ED. 3. Patients who felt unsafe going to the ED were less likely to go to the ED for severe abdominal pain and persistent fever. 4. The unsafe group reported increased concern over COVID-19, stress being around others, and fear of public places. 5. Education on actual vs perceived risk and importance of ED visits is critical to ensure patients receive appropriate care for conditions requiring medical intervention as avoidance could be deleterious.

NORTH CAROLINA POSTER FINALIST - RESEARCH Shaleen Thakur

Food Insecurity is Associated with Impaired Lung Function

Title

Food Insecurity is Associated with Impaired Lung Function

Authors

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Introduction

Food insecurity (FI), the lack of consistent access to enough food for an active and healthy life, is a major public health problem affecting over 10.5% of the U.S. population and may be an important social determinant of health for patients with lung disease. Previous studies have demonstrated that FI is associated with smoking, as well as numerous negative health outcomes including hypertension, diabetes, and cardiovascular disease. However, little is known about the effect of FI on pulmonary function. Thus, the objectives of this study were to: (1) determine the prevalence of FI in patients referred for pulmonary function tests (PFTs) and, (2) determine if patients with FI were more likely to have worse pulmonary function than food secure patients.

Methods

We implemented systematic FI screening of all patients presenting to the PFT lab at Wake Forest Baptist Health using a validated 2-item FI questionnaire: (1) Within the past 12 months, the food we bought just didn't last and we didn't have the money to get more. (2) Within the past 12 months, we worried whether our food would run out before we got money to buy more. A response of "sometimes" or "often" to either question was considered a positive screen, and all patients (= 18 years of age) presenting for PFTs were eligible to be screened. We conducted a cross-sectional study of all patients who were screened for FI between 3/1/2018-

2/2/20. Our primary exposure was FI (food insecure versus food secure), and our primary outcome was percent predicted forced expiratory volume in one second (FEV1%). We conducted bivariate analysis evaluating the association between FI and patient covariates, including age, gender, race/ethnicity (white, African American, Hispanic or other), smoking status (yes or no), insurance type, Charlson Comorbidity Index (CCI), and body-mass index (BMI). We also evaluated the association between FI and FEV1% using multivariable generalized linear models (GLM), controlling for all covariates.

Results

Of the 5346 patients included, 1091 (20.4%) screened positive for FI, higher than the North Carolina statewide prevalence of 14.4%. Participants who were food insecure were significantly more likely to be younger, African American, a current smoker, receive Medicaid, and have a higher BMI (all p

Conclusion

In this study, we found that FI is highly prevalent in patients referred for PFTs at our academic health center, and patients with FI had a significantly lower FEV1% than patients who were food secure. Previous studies have demonstrated the importance and possible implications of screening for FI across various patient populations. It has been hypothesized that FI may be an important factor in lung disease given its association with smoking, COPD, and medication underuse. Future studies will need to evaluate if addressing FI in clinical care settings can improve lung function.

OHIO POSTER FINALIST - RESEARCH Karam Atli

The Impact of Surgical Chronology on Outcomes of Patients Receiving Lumbar Spine and Lower Extremity Joint Surgeries

Title

The Impact of Surgical Chronology on Outcomes of Patients Receiving Lumbar Spine and Lower Extremity Joint Surgeries

Authors

Karam Atli, MS; Gabriel Smith, MD; Konrad Knusel, MS; Edward Benzel, MD; Ajit Krishnaney, MD; Michael Steinmetz, MD; Thomas Mroz, MD

Introduction

The aging population and obesity epidemic indicate that increasingly more patients with lumbar spine pathology will likely also develop lower extremity joint (LEJ) disease (hip and/or knee). These patients may have co-existing lower back and extremity pain, the major source of which (spine vs. LEJ) is difficult to determine. There remains a lack of outcomes data of patients who receive surgeries for both an LEJ and the lumbar spine within a short period based on chronology of surgery type. This is the first report that evaluates the differences in surgical outcomes of patients receiving lumbar surgery following LEJ surgery compared to receiving lumbar surgery before LEJ surgery.

Methods

Retrospective chart review was performed of patients undergoing lumbar surgery between 2008-2015 and receiving hip/knee surgery within three years prior/ following lumbar surgery at a single institution. Pre- and post-operative outcome measures were assessed using the EuroQol five dimensions questionnaire (EQ5D) and Pain Disability Questionnaire (PDQ).

Results

670 patients were included. Patients receiving lumbar surgery first were 4.75 times more likely to reach the minimal important difference in PDQ. Patients receiving LEJ surgery first had a higher mean Charlson Comorbidity Index. Male patients were 37% less likely to be readmitted within 90 days of either procedure.

Conclusion

Postoperatively, patients who received lumbar surgery before LEJ surgery had greater improvement than patients who received LEJ surgery before lumbar surgery. These findings suggest that in patients with a co-existing need for lumbar and LEJ surgery, greater consideration should be given to providing lumbar surgery before LEJ surgery. The findings of this study are applicable to multiple disciplines including primary care, orthopedics, and neurosurgery, and warrants further large-scale prospective investigation to determine the cause and generalizability of these surgical outcomes results.

OHIO POSTER FINALIST - RESEARCH Christine M Doherty

Social Behaviors Associated with a Positive COVID-19 Test Result.

Title

Social Behaviors Associated with a Positive COVID-19 Test Result.

Authors

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Introduction

SARS-CoV-2 has infected >53 million individuals worldwide, with over 1 million deaths as of November 15, 2020 [1]. SARS-CoV-2 is highly transmissible with an estimated reproductive number of 2, approximately double that of influenza [2]. To mitigate the spread of COVID-19, the disease caused by SARS-CoV-2, there has been widespread promotion of public health measures. These measures, developed from experiences with other coronavirus outbreaks such as SARS, include isolation, quarantine, social distancing, and community containment. Population-based studies provide evidence that these measures have slowed the spread of COVID-19 [3,4]. We wanted to explore the impact of specific recommendations, such as working/studying from home, avoiding visiting other people's homes and disinfecting groceries/packages on the spread of the novel coronavirus. It is important to identify which public health recommendations are most effective to support adherence and mitigate the psychosocial and economic impacts of unnecessary recommendations. In this case-control study, we describe patterns of COVID-19 prevention behavior among individuals in Ohio and Florida and differences between patients testing positive for COVID-19 versus uninfected patients.

Methods

We identified COVID-19 positive cases from the Cleveland Clinic COVID-19 data registry and age and gender-matched controls from the Electronic Health Record (EHR) such that responses had approximately a 2:1 ratio. We sent all patients a 14-question survey regarding their social distancing behaviors via the EHR. We developed the survey by reviewing surveys of past epidemics [5,6] and the PhenX toolkit[7]. The survey was pilot-tested for clarity. We recruited cases on the day of or the day following their first positive COVID-19 PCR test result, and

controls weekly. We contacted cases to administer the survey by phone if they did not complete the mailed survey within two days. Controls were contacted electronically through our patient portal. We excluded patients if they were non-English speaking, had dementia, resided in a skilled nursing facility, were currently hospitalized, or were not active on the EHR patient portal. Data was collected from May-June 2020. Survey responses for cases and controls were compared using Pearson chi-square or Fisher's Exact tests as appropriate.

Results

A total of 339 participants completed the survey (113 cases, 226 controls); 45 (40%) cases had known contact with COVID-19. Social behaviors were analyzed for participants with no known close contact. Cases were more likely to reside with someone who had URI symptoms within the past week (22% vs. 3%, p

Conclusion

Sixty percent of cases had no known contact with COVID-19, indicating ongoing community transmission. The elevated proportion of cases who work outside the home provides further evidence for the recommendation for remote telework when possible and continued social distancing.

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OHIO POSTER FINALIST - RESEARCH Justin Jiang

Survival Outcomes in Allogeneic Stem Cell Transplantation: An Institutional Experience

Title

Survival Outcomes in Allogeneic Stem Cell Transplantation: An Institutional Experience

Authors

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Introduction

Allogeneic hematopoietic stem cell transplantation (allo-SCT) is a potentially curative treatment for many hematological disorders that is often complicated by relapse of the underlying disease, graft-vs-host disease (GVHD), and infectious complications. Hence, we conducted a retrospective analysis on allo-SCT at The Ohio State University from 1984-2018 to better understand how survival has changed longitudinally in accordance with therapeutic advancements made to mitigate these complications.

Methods

We analyzed data from 1943 consecutive patients who received an allo-SCT from 1984-2018. Patients were divided into groups (gps) based on the year (yr) of transplant: gp1: 1984-1988, gp 2: 1989-1993, gp 3: 1994-1998, gp 4: 1999-2003, gp 5: 2004-2008, gp 6: 2009-2013, and gp 7: 2014-2018. Primary endpoints were progression free survival (PFS), overall survival (OS), and GVHD-free relapse-free survival (GRFS), which were calculated using Kaplan-Meier curves and compared using log-rank test. The secondary endpoints were the cumulative incidences of grade II-IV and grade III-IV acute GVHD (aGVHD) and non-relapse mortality (NRM), which were estimated and compared using Gray's test accounting for competing risks.

Results

Median age at transplant was 50.0 yrs (range: 18-76) and 59.6% of the patients were male. Myeloablative conditioning was used for 55% of patients. From 1999-2018, there was statistically significant improvements in PFS, OS, and GRFS (p

Conclusion

Our data shows improved OS, PFS, and GRFS post allo-SCT over the decades, which may be attributed to advances in supportive care and GVHD/relapse mitigation therapy. The decline in NRM is also likely due to improved supportive measures such as infectious disease monitoring and prophylaxis. Nonetheless, continued efforts should be focused on reducing post-transplant mortality.

OHIO POSTER FINALIST - RESEARCH Katherine Julian

Out-of-Pocket Costs of Insulin and Diabetes-Related Supplies among Privately Insured Patients with Type 1 Diabetes

Title

Out-of-Pocket Costs of Insulin and Diabetes-Related Supplies among Privately Insured Patients with Type 1 Diabetes

Authors

Katherine Julian, BS Djibril Ba, MPH Guodong Liu, PhD Douglas L. Leslie, PhD Cynthia H. Chuang, MD, MSc

Introduction

While the average list price of insulin nearly tripled between 2002 and 2013, it is unknown to what degree the financial burden of diabetes care has been transferred to patients. Using claims data from 2005 to 2017, we quantified the trends in annual out-of-pocket costs for both insulin and diabetes-related supplies for privately insured US patients with type 1 diabetes.

Methods

This retrospective study was performed using IBM Watson Health MarketScan national commercial claims data from 2005 to 2017. For each year from 2005-2017, we identified patients aged 0-64 years with a type 1 diabetes diagnosis code (ICD-9-CM and ICD-10-CM), at least 1 prescription drug claim for insulin, and continuous enrollment during that year. Diabetes-related supplies were identified by prescription drug and outpatient claims using HCPCS and CPT codes following methodology described by Chua et al. (2020). Supplies included glucose meter test strips, syringes, needles, lancets, and glucose blood tests. Annual out-of-pocket costs were computed by combining deductible, copayment, and coinsurance amounts for all insulin formulations and supplies. All costs were adjusted for inflation using the Consumer Price Index and expressed in 2017 dollars. Because the data collected was de-identified, our institutional review board exempted this study from review.

Results

The study population included 570,111 unique patients with a mean (SD) age of 44.0 (15.8). The mean (SD) annual out-of-pocket cost per patient for insulin was $270 ($248) in 2005 and $384 ($494) in 2017, representing a 42% increase. The mean annual out-of-pocket cost for diabetes-related supplies also rose from $214 ($445) in 2005 to $326 ($1178) in 2017, a 52% increase

over time. Notably, the average annual out-of-pocket cost for insulin plus diabetes-related supplies combined increased by 54% over the thirteen-year period from $424 ($551) in 2005 to $651 ($1256) in 2017.

Conclusion

Our results demonstrate that among privately insured patients, the combined out-of-pocket costs for insulin and diabetes-related supplies increased by 54% between 2005-2017, even after adjusting for inflation. Patients with type 1 diabetes require regular insulin administration and monitoring to prevent dangerous complications such as diabetic ketoacidosis and long-term complications related to chronic poor glycemic control. As the costs of insulin and associated supplies have skyrocketed over the years, the ability of patients to prevent these complications could be compromised. The barriers to insulin adherence are augmented today due to the COVID-19 pandemic, where patients and their families may be struggling with financial instability, loss of employment and insurance, and food insecurity. Insulin is just one example of many medications that are becoming increasingly unaffordable for patients. As we better understand the cost burden this puts on patients, we need health policy and legislative solutions to address both medication coverage and capping the rising costs of insulin and diabetes-related supplies. The rate at which the costs of insulin and diabetes-related supplies are increasing is not sustainable for patients in the years to come.

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OHIO POSTER FINALIST - RESEARCH Alexandria Lenyo

Impact of immunocompromising conditions on severity of COVID-19 presentation and outcomes

Title

Impact of immunocompromising conditions on severity of COVID-19 presentation and outcomes

Authors

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Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the agent of coronavirus disease 2019 (COVID-19), has resulted in a worldwide pandemic. One of the initial hypotheses linked poor outcomes to a dysregulated hyperinflammatory response. As a result, immunosuppressive medications have been proposed for treatment of severe cases of COVID-19. In patients with other respiratory viruses, such as influenza, immunosuppression has been shown to be a major risk factor for worse outcomes. We sought to evaluate the impact of immunocompromising conditions in patients admitted for COVID-19-related pneumonia.

Methods

We constructed a retrospective observational study including patients admitted with COVID-19 pneumonia at any of the BJC Healthcare Hospitals between March 15 and May 13. Inclusion criteria were duration of admission of more than 24 hours and positive nasopharyngeal RT-PCR for SARS-CoV-2. Data collection and follow-up were completed on August 27. Collected data included demographics (age, race, gender), comorbidities (Elixhauser comorbidity score, nursing home residence, cardiovascular, renal, and pulmonary conditions, diabetes, obesity, substance abuse) and markers of severity of presentation (presence of shock, need for mechanical ventilation). Immunocompromising conditions were grouped in: hematological malignancy or bone marrow transplantation, solid organ transplantation, solid cancer on chemotherapy, use of TNF-a inhibitors, and chronic use of glucocorticoids. Primary outcome was all-cause mortality, and secondary outcomes were the need for ICU stay, length of ICU stay, the need for mechanical ventilation (MV), and MV-free days.

Results

627 patients met the inclusion criteria and 80 (14.6%) were immunocompromised at admission. Immunocompromised patients were more likely to be non-African American and with lower BMI. Immunocompromised patients were less likely to develop shock (21.3% vs 28.7%, p=0.164), require ICU admission (33.8% vs 38.8%, p=0.389), require MV (22.5% vs 28.5%, p=0.275), and had lower mortality rates overall compared to non-immunocompromised patients (20% vs 26.1%, p=0.238). Age, admission from nursing homes, non-white race and need for more than 6 L of oxygen and mechanical ventilation were significant predictors for mortality in multivariable logistic regression (MLR) analyses. Immunocompromised status did not impact admission to the ICU and all-cause mortality.

Conclusion

Immunocompromised status did not seem to impact mortality and need for ICU admission for COVID-19 patients in our single center cohort. Future larger studies and analyses including treatment data will further characterize the trajectory of immunocompromised patients admitted for COVID-19 related pneumonia.

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OHIO POSTER FINALIST - RESEARCH Danny Lynch

Written Prescription for Over-the-Counter Nonopioid Pain Medications Does Not Increase the Likelihood of Use after Ambulatory Hand and Upper Extremity Surgery

Title

Written Prescription for Over-the-Counter Nonopioid Pain Medications Does Not Increase the Likelihood of Use after Ambulatory Hand and Upper Extremity Surgery

Authors

Daniel Lynch, BS Lin James, MD Kanu Goyal, MD

Introduction

Increases in the emphasis on pain control and prescription of opioids have contributed to the start of the current opioid epidemic. Post-operative multimodal pain regimens that include non-opioid pain medications have been developed and encouraged. Currently, it is unclear whether providing written prescriptions for non-opioid pain medication has any effect on postoperative pain medication usage and pain control. This study looked to determine how written prescriptions may affect post-operative consumption of opioid and non-opioid medication and self-rated pain control for both soft tissue and bone procedure patients.

Methods

Patients undergoing hand and upper-extremity surgery (n = 244) were recruited after implementation of a post-operative pain control program encouraging non-opioids before opioids. Patients were grouped based on procedure type: bone (n=66) or soft tissue (n=178). Patients reported postoperative medication consumption and pain control scores. Two-tailed t-tests assuming unequal variance were performed to look for differences in postoperative pain control and medication consumption between those who were and were not given written prescriptions for non-opioids.

Results

Receiving a written prescription for postoperative non-opioids did not have a significant effect on postoperative pain control in either procedure group. However, there was a trend indicating that patients who underwent soft tissue or bone procedures that were prescribed non-opioids reported better overall postoperative pain control than those patients who were not prescribed non-opioids. Regardless of the receipt of a written prescription for postoperative non-opioids, patients who underwent soft tissue procedures reported better pain control than those who

underwent bone procedures. Receiving a written prescription for postoperative non-opioids did not have a significant effect on patients' daily consumption of non-opioids in either procedure group. Regardless of receiving a written prescription, patients in either procedure group on average consumed more daily non-opioids than opioids. Patients who underwent soft tissue procedures, regardless of the receipt of a written prescription for postoperative non-opioids, consumed significantly more daily non-opioids than daily opioids. There was no significant difference between daily opioids and non-opioids consumed for bone procedure patients. Receiving a written prescription for postoperative non-opioids did not have a significant effect on patients' daily consumption of opioids in either procedure group. Regardless of receiving a written prescription, patients in the soft tissue procedure group on average consumed fewer daily opioids than those who underwent bone procedures. For both procedure groups the receipt of a written prescription for postoperative non-opioids did not have a significant effect on the percentage of originally prescribed opioids not consumed after surgery (Table 6). In general, regardless of the receipt of a written prescription for opioids, patients who underwent soft tissue procedures reported not consuming a larger percentage of their respective amount of originally prescribed opioid pills compared to the patients who underwent bone procedures.

Conclusion

Receiving written prescriptions for non-opioids may not have a significant effect on postoperative pain control or medication consumption. Patients undergoing soft tissue hand and upper extremity procedures may be more likely to consume more daily non-opioids than opioids postoperatively compared to bone procedure patients regardless of whether they receive a written prescription for non-opioids.

OHIO POSTER FINALIST - RESEARCH Shruthi Sethuraman

Prevalence of metabolic syndrome in low-risk patients developing oral cavity cancer

Title

Prevalence of metabolic syndrome in low-risk patients developing oral cavity cancer

Authors

Shruthi Sethuraman BS, Nolan Seim MD

Introduction

Oral cavity cancer (OCC) is an unforgiving and serious malignancy that ranks within the top ten most common cancers in the world. Oral cavity cancer is cancer associated with the lips, tongue, floor of mouth, hard palate, gums, buccal mucosa, and retromolar trigone. While there are certain known risk factors for OCC such as tobacco and alcohol, this project hopes to elucidate the clinical, environmental, and genetic factors surrounding the 15-20% of OCC patients without the typical risk factors to this deadly malignancy. Previous work has shown that OCC incidence is higher in men compared to women, and that white men are disproportionately affected compared to all other races. In the last decade there has been an increase in the number of young patients diagnosed with OCC, specifically tongue cancer among young, white, female patients.

Methods

We worked to analyze this low-risk patient population treated at the James Comprehensive Cancer Center through clinical chart review from the past 7 years while characterizing each patient's past medical, social, and family history as well as by comparing clinical outcomes to identify commonalities among these low-risk patients. We then performed statistical analysis to determine if these patterns are significant from the typical OCC population

Results

The results from this study elucidated several key features between our two cohorts, non-smokers and non-drinkers or non-smokers and

Conclusion

By characterizing our low-patient population as having an increased prevalence of metabolic syndrome, we believe that we have identified a significant risk factor that predisposes a large proportion of our patients, approximately 22%, to oral cavity cancer. While the causative link between non-smokers and non-drinkers developing cancer is still unknown, this data clearly demonstrated key differences that can not only be explored in greater detail in future studies but can also be used to screen low-risk patients.

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OHIO POSTER FINALIST - RESEARCH Eashwar Somasundaram

Lung Cancer Survival Is Associated with Persistent Homology of Tumor Imaging

Title

Lung Cancer Survival Is Associated with Persistent Homology of Tumor Imaging

Authors

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Introduction

Radiomics has been useful in informing clinical oncology decisions from image analysis alone. This field may benefit by incorporating persistent homology, a popular new algorithm that analyzes whole data structure. We hypothesized that persistent homology could be applied to lung tumor scans and predict clinical variables.

Methods

All computed tomography lung scans (n = 565) were obtained from the NSCLC-Radiomics and NSCLC-Radiogenomics datasets in The Cancer Imaging Archive. Segmentation data was used to create a cubical region centered on the primary tumor in each scan. For each scan, a cubical complex filtration based on Hounsfield units was generated. We created a feature curve that plotted the number of zero dimensional topological features against each Hounsfield unit. The curve's first moment of distribution was utilized as a summary statistic to predict survival in a Cox proportional hazards model. The first moment of distribution is equivalent to the area under the curve of our topological feature curves (AUC). Kruskal-Wallis H Test and a post-hoc Dunn's test with Bonferroni correction were used to test AUC differences among survival quartiles.

Results

After controlling for tumor image size, age, and stage, AUC, was associated with poorer survival (HR = 1.118; 95% CI = 1.026-1.218; p = 0.01). AUC was significantly higher for patients in the lowest survival quartile compared to the highest survival quartile ($p < 0.001$).

Conclusion

We have shown that persistent homology can generate useful clinical correlates from tumor CT scans. Our zero-dimensional topological feature curve statistic predicts survival in lung cancer patients. This statistic may be used in tandem with standard radiomics variables to better inform clinical oncology decisions. The next step is to identify the best set of imaging variables such as our topological feature curve to create predictive models that assist clinical judgement.

ONTARIO POSTER FINALIST - RESEARCH Mokshal Porwal

Alopecia in Multiple Sclerosis Patients Treated with Disease Modifying Therapies

Title

Alopecia in Multiple Sclerosis Patients Treated with Disease Modifying Therapies

Authors

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Introduction

Multiple sclerosis (MS) is a neurodegenerative disease of the central nervous system. Disease modifying therapies (DMTs) are classes of medications aiming to reduce relapse rate, MRI activity, and slowing disease progression. DMTs have variable adverse effects that are discussed with MS patients before treatment initiation.

Alopecia is loss of hair from areas of the body where it normally grows and can cause deep personal impacts.1 Hair loss is a possible side effect that is classically linked to teriflunomide and interferons.2,3,4 We received anecdotal reports of hair thinning from some MS patients treated with other DMTs. Thus, we aimed to examine reports of alopecia associated with use of various DMTs utilizing the FDA Adverse Event Reporting System (FAERS). The goal of this study was to analyze the frequency and proportions of reported alopecia per medication per year. Furthermore, we aimed to stratify the reports based on age, biological sex, and report source.

Methods

We queried the FDA Adverse Event Reporting System (FAERS), a self-reported medication adverse event database that includes post marketing adverse reports.5 We studied the reaction term “Alopecia”, classified under “Skin and Subcutaneous Tissue Disorders” for ocrelizumab, interferon beta 1a, interferon beta 1b, glatiramer acetate, dimethyl fumarate, fingolimod, teriflunomide, alemtuzumab, natalizumab, cladribine, and rituximab. We excluded reports where the reason for use did not include “Multiple Sclerosis”. Additionally, we excluded siponimod, and ozanimod due to minimal reports (3 and 0 respectively). We collected yearly reported alopecia cases for each drug between Jan 1, 2009 and Dec 31, 2019 (determined by “Latest FDA Received Date”) and sorted the cases based on age groups, sex, and report source.

Results

We identified 7978 alopecia reports among 43,655 reports in skin and subcutaneous tissue disorders (18.3%). 3255 (40.8%) with teriflunomide, 1641 (20.6%) with dimethyl fumarate, 955 (12.0%) with natalizumab, 776 (9.7%) with fingolimod, 635 (8.0%) with interferon beta 1a, 332 (4.2%) with glatiramer acetate, 142 (1.8%) with ocrelizumab, 126 (1.6%) with interferon beta 1b, 86 (1.1%) with alemtuzumab, 17 (0.2%) with cladribine, and 10 with rituximab (0.1%). Reports were made mostly by patients for all DMTs (78.1%) and highest in fifth and sixth decades of life except alemtuzumab, which had a higher proportion at younger ages. Proportion of female reports (of combined male and female) were 0.9044 for teriflunomide, 0.8860 for dimethyl fumarate, 0.9215 for natalizumab, 0.9278 for fingolimod, 0.9213 for interferon beta 1a, 0.8735 for glatiramer acetate, 0.9437 for ocrelizumab, 0.9524 for interferon beta 1b, 0.8837 for alemtuzumab, 0.6471 for cladribine, and 0.9000 for rituximab.

Conclusion

We identified frequent reports of alopecia between January 1, 2009 to December 31, 2019 for teriflunomide, dimethyl fumarate, natalizumab, fingolimod, interferon beta 1a, glatiramer acetate, ocrelizumab, interferon beta 1b, alemtuzumab, cladribine, and rituximab. All medications displayed more reports in females. Source of reporting varied among DMTs, but was largely driven by patients for most DMTs, except for glatiramer acetate, alemtuzumab, and cladribine where approximately half of the reports were made by healthcare providers. Possible alopecia, even if transient, should be part of regular patient education when starting DMTs.

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OREGON POSTER FINALIST - RESEARCH Teva D Brender

Prevalence and Characteristics of Advocacy Curricula in U.S. Medical Schools

Title

Prevalence and Characteristics of Advocacy Curricula in U.S. Medical Schools

Authors

Teva Brender, BS, Wesley Plinke, MPH and Jane M. Zhu, MD, MPP, MSHP4

Introduction

Recent national events, including the COVID-19 pandemic and protests on racial inequities, have drawn attention to the role of physicians in advocating for improved social, economic, and political factors that affect health. Medical training may be an opportune time to shape future physicians' understanding of their professional responsibilities, and to teach the skills necessary to fulfill these obligations. Understanding the extent to which physician advocacy is being taught in medical schools, and the nature of this instruction, is needed in order to help define expectations of advocacy training in medical education.

Methods

Using the Association of American Medical College's (AAMC) member school directory, we compiled a list of 154 allopathic medical schools in the U.S. in 2019-2020. We used multiple search strategies to identify online course catalogues and advocacy-related curricula using variations of the terms "advocacy", "policy", "equity", and "social determinants of health." We used an iterative process to generate a preliminary coding schema and to code all course descriptions, conducting content analysis to describe the structure of courses and topics covered.

Results

Of 134 medical schools with any online course catalogue available, 76.9% (n = 103) offered at least one advocacy course. Of the 122 schools that published their required course descriptions, slightly more than half had a required course that covered elements of advocacy (n = 64). Of the 112 schools that published their elective course descriptions, two-thirds (n = 75) offered elective courses on advocacy. Required courses were typically survey courses focused on general content in health policy, population health, or public health/epidemiology, whereas elective courses were more likely to focus specifically on advocacy skills-building (43.3% vs. 5.3%) and to feature field experiences in the community (48.3% vs. 20.2%). Of the advocacy-

specific courses, 93 (26.4%) concentrated on a specific population, such as children or persons of low socioeconomic status. Relatively few courses (n = 8) focused on racial/ethnic minorities and racial inequities.

Conclusion

Our findings suggest that while most U.S. medical schools offer at least one advocacy course, the majority are elective rather than required and there is significant variation in the structure and content of advocacy-related courses. Our analysis suggests heterogeneity in the availability and instruction of advocacy curriculum, but also offers several curricular models for educators looking to further integrate advocacy coursework into medical school curriculum. Given the greater urgency of calls to address social, economic, and political factors affecting health and health equity, this study provides an important and timely overview of the prevalence and content of advocacy curricula at U.S. medical schools from which to build upon.

OREGON POSTER FINALIST - RESEARCH Jenna Davison

Inequities in frontline and non-frontline employment status by race and ethnicity during COVID-19

Title

Inequities in frontline and non-frontline employment status by race and ethnicity during COVID-19

Authors

Jenna Davison BS, Jordan Gemelas BS, Case Keltner MPH, Samantha Ing MD

Introduction

Research has confirmed that COVID-19 disproportionately affects people of Color in the US, and that marginalized populations are more likely to have been employed in higher-risk, frontline sectors prior to the pandemic [1]. Access to equal pay, paid sick leave, and unemployment benefits are just a few aspects of disparities people of Color experience in the employment sector [2-6]. However, it remains unclear if and how employment disparities by sector and race or ethnicity have changed in the context of the recent economic downturn. The objective of this study was to determine whether Black or African American, Asian American, and Hispanic or Latinx workers have experienced disparate levels of employment retention in frontline versus non-frontline occupations compared to White, non-Hispanic or non-Latinx counterparts during COVID-19.

Methods

In this retrospective cohort study, quarterly data from the US Bureau of Labor Statistics (BLS) sample of 60,000 households was analyzed. Crude and adjusted odds ratios with Wald 99.9% confidence intervals were produced to test for associations between race and ethnicity (for workers identifying as Black or African American, Asian American, or Hispanic or Latinx) and change in number employed from Q1 (January – March 2020) to Q2 (April – June, 2020).

Results

Compared to White counterparts, Black or African American identity was associated with an overall 26.5% greater odds of job loss in Q2 2020. Asian American identity was associated with an overall 39.2% greater odds of job loss, and Hispanic or Latinx identity was associated with an overall 46.8% greater odds of job loss. When stratified by sector, Hispanic or Latinx frontline (OR=1.520, 99.9% CI{1.518 - 1.523}), Asian American frontline (OR=1.875, 99.9% CI{1.887-

1.882}), and Black or African American non-frontline (OR=1.736, 99.9% CI{1.731 - 1.741}) workers had increased odds of job loss. Workers from Asian American or Hispanic or Latinx identities were more likely to keep jobs that were non-frontline. In contrast, workers from Black or African American identity were more likely to keep jobs that were frontline (OR=0.935, 99.9% CI{0.932 - 0.938}).

Conclusion

Populations in marginalized groups are subject to increased likelihood of job loss during COVID-19 as a product of structural racism. Because employment is both an important social determinant of health, and, for frontline workers, a potential risk factor for exposure to SARS-CoV-2, these trends may provide a partial mechanistic understanding of the striking health disparities previously identified (i.e., marginalized communities at increased risk for infection, severe illness, and death). Policies targeting employment could reduce the health impacts of COVID-19 on people of Color. These findings suggest that structural racism is a contributor to the appalling disparities endured by communities of Color. To protect the health and safety of oppressed populations, policymakers must take immediate action to implement greater worker protections for marginalized groups. Policies directed at improving access to health insurance, income support, improving access to PPE, hazard pay, and sustained health insurance for frontline workers, could reduce the health impact of COVID-19 on marginalized populations. Future studies should examine the relative benefits of each of these interventions.

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PENNSYLVANIA POSTER FINALIST - RESEARCH Madeleine Norris

"The Vagina Monologues" Teaches Doctors Empathy and Communication

Title

"The Vagina Monologues" Teaches Doctors Empathy and Communication

Authors

Madeleine Norris, Salvatore Mangione, MD

Introduction

Many undergraduate programs perform “The Vagina Monologues”, yet, only a few medical schools do so, even though the play focuses on a component of human anatomy. At Sidney Kimmel Medical College of Thomas Jefferson University (SKMC), students have staged the play for more than a decade. Weekly rehearsals have also allowed participants to discuss monologue topics such as sexual assault, childbirth, and the transgender experience, thus helping them better understand these difficult issues. Empathy is a fundamental component of ‘professionalism’, but has been shown to decline during medical training together with students’ well-being1. Since medical education requires innovative ways to rekindle empathy and resilience, we looked at whether participation in the ‘Vagina Monologues’ might foster them both.

Methods

We surveyed female physicians who had acted in “The Vagina Monologues” while students at SKMC. Through an alumni network, we reached twenty-four women, and eighteen completed our survey. Respondents ranged from PGY-1 residents to attending physicians. The anonymous survey comprised of five open-ended and twelve Likert scale questions assessing competencies that might have been improved by participation in the play. Respondents rated agreement with our questions on a 1-5 scale, with 5 indicating “Strongly Agree” and 1 “Strongly Disagree”. Two confounding questions were included to assess the validity of responses.

Results

Of the personal qualities measured in our survey, respondents most strongly agreed that participation in the play made them comfortable discussing sexual health with patients of all genders (mean 4.6) while disagreeing that participation adversely impacted their academic

performance (mean 1.3). Greater empathy, conscientiousness towards peers, and open-mindedness all scored means of 4.5. The most common themes in the short answer section were increased comfort in discussing 'taboo' topics, the importance of community, and a greater appreciation of diversity. One respondent said: "It taught me how to think and talk about difficult issues… with colleagues, which directly translated to my ability to confidently talk about difficult issues with patients." Responders consistently noted that the play forged meaningful relationships among participants and offered a safe reflection space. As one put it, "I feel more comfortable opening up to my peers, especially about my perceived faults." Another commonly reported benefit was enhanced confidence and better public speaking skills. One participant said that "' The Vagina Monologues' gave me the confidence to speak up for myself."

Conclusion

Our survey suggests that "The Vagina Monologues" can foster communication skills and empathy during medical school, while at the same time supporting students' well-being. The emphasis on community among respondents further indicates that participation in the play nurtures peer support. This is important since it might help improve wellness in a population at high risk for depression and isolation2. Of course, not all students might want to perform in the play, yet benefits might still be gained by attending the event and thus being exposed to uncomfortable issues. While we did not study this latter aspect of the play, it might be an important subject for future research.

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PENNSYLVANIA POSTER FINALIST - RESEARCH Mary B White

Student Health Professional Patient Initiative: Solutions to Patient Outreach, Screening, and Continuity in the COVID-19 Pandemic

Title

Student Health Professional Patient Initiative: Solutions to Patient Outreach, Screening, and Continuity in the COVID-19 Pandemic

Authors

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Introduction

The COVID-19 pandemic has significantly affected ambulatory care. In April 2020, it is estimated that primary care office visits decreased by 50%. In the city of Philadelphia, ambulatory practices at Thomas Jefferson University Hospital (TJUH) needed to adapt their workflow to protect patients and staff from exposure to the virus, while abiding by social distancing guidelines. It was essential for TJUH to maintain both continuity of and access to care during the pandemic. This quality improvement initiative demonstrates how health professional students (HPS) can help alleviate the new burdens placed on ambulatory offices and ensure that patients remain connected to their providers during the COVID-19 pandemic.

Methods

In March, the Jefferson Internal Medicine Associates (JIMA) began the initiative, and the Women's Primary and Specialty Care (WPSC) office joined in June. HPS contacted patients via phone prior to their scheduled appointments. Patients were able to cancel, reschedule, convert appointments to telehealth through phone or video, or keep their in-person appointments. Patients who elected to convert to telehealth services were educated by the HPS on set-up and utilization of the telehealth platform. If patients kept their in-person appointment, patients were screened for COVID-19 symptoms and possible exposures. Three months into the initiative, the volume of in-person visits increased; the focus shifted to pre-appointment COVID-19 screening. If patients screened positive, they were referred to an in-house nurse or physician for further triage. Novel documents were created for the HPS scripts, patient documentation, and telehealth education resources. Student volunteers were recruited through a volunteer website created by HPS. Each office designated a HPS coordinator to manage volunteer

schedules and communicate with office contacts, streamlining communication between volunteers and office staff.

Results

Over 200 HPS participated in the initiative. Between March 19th and May 15th, JIMA HPS made 2,734 patient calls with a large portion of patients canceling, rescheduling, or unable to be reached. After WPSC joined the initiative and the focus of patient calls shifted to pre-appointment COVID-19 screening, JIMA and WPSC collectively made 3,990 patient calls between May 16th to July 23rd. 2,951 (74%) patients were reached; of those, with some fitting into multiple categories, 1,792 screened negative for in-person visits, 818 were telehealth, 304 rescheduled or canceled, and 173 screened positive for a potential COVID-19 symptom or exposure and were referred to a physician or nurse for further evaluation. There have been no COVID-19 cases to date at JIMA or WPSC from patient to staff exposure.

Conclusion

Volunteer HPS initiatives can be a valuable solution for ambulatory offices during the COVID-19 pandemic to maintain a high volume of patient outreach and ensure the safety of patients and staff. In the beginning of the pandemic, patients preferred to cancel or reschedule appointments. When case burden decreased and telehealth became more established, patients preferred in-person or telehealth appointments. Although most patients achieved their desired appointment outcome, the COVID-19 pandemic continues to evolve and place new strains on healthcare. Solutions for patient outreach that do not place additional burden on office staff should continue to be investigated.

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RHODE ISLAND POSTER FINALIST - RESEARCH Navya Baranwal

Racial and Ethnic Disparities in Preemptive Kidney Transplantation Among US Adults with Incident Kidney Failure, 2006 to 2019

Title

Racial and Ethnic Disparities in Preemptive Kidney Transplantation Among US Adults with Incident Kidney Failure, 2006 to 2019

Authors

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Introduction

Kidney failure, also known as end-stage kidney disease (ESKD), afflicts over 700,000 people in the United States.1 Preemptive kidney transplantation (PKT) is the preferred treatment for kidney failure as it is associated with improved graft function, fewer medical complications, improved quality of life and survival, and less exposure to dialysis-associated adverse outcomes.2-4 Among kidney transplant recipients, Black and Hispanic people are less likely to receive PKT than white people, but less is known about disparities in PKT among the entire incident kidney failure population.5,6 This is a critical gap in knowledge given the Advancing American Kidney Health goal of having 80% of all new ESKD patients receiving transplant or home dialysis by 2025.7 This study assessed racial/ethnic disparities in initial treatment with PKT vs. dialysis among all incident kidney failure patients aged 19-74 from 2006 to 2019.

Methods

Treatment modality for incident kidney failure patients was identified using the CMS Medical Evidence Report Form. Linear regression models estimated PKT rates for non-Hispanic white,

non-Hispanic Black, Hispanic and Asian patients, adjusting for clinical, geographic, socioeconomic, and access factors.

Results

Among 1,207,576 incident kidney failure adult patients, the age-sex adjusted rate of PKT declined from 2.9% in 2006 to 2.4% in 2019 (adjusted change: -0.5% [95% CI: -0.7 to -0.3%]). From 2006 to 2019, age-sex adjusted PKT rates changed from 5.0% to 3.8% for non-Hispanic white patients (-1.1% [95% CI: -1.3 to -0.8%]), 0.5% to 0.7% for non-Hispanic Black patients (+0.05% [95% CI: -0.1 to 0.2]), 1.3% to 1.2% for Hispanic patients (-0.1% [95% CI: -0.4 to 0.2%]), and 2.3% to 2.7% for Asian patients (+0.4% [95% CI: -0.4 to 1.2%]). There exists a 3.86 (95% CI: 3.79 – 3.92), 3.16 (95% CI: 3.08 – 3.24), and 1.62 (95% CI: 1.46 – 1.78) percentage point difference between the PKT rate of non-Hispanic white patients and non-Hispanic Black patients, Hispanic patients, and Asian patients respectively from 2006-2019. These differences persisted after adjusting for clinical, geographic, SES, and pre-ESKD nephrology care. Racial/ethnic disparities in PKT receipt declined over the study period, but attenuation in disparity was due to a decrease in PKT rates for non-Hispanic whites rather than a meaningful increase in PKT rates for any of the racial and ethnic minority groups.

Conclusion

Among incident kidney failure adult patients, racial/ethnic disparities in receipt of PKT are substantial, persistent, and not explained by differences in observed clinical factors and socioeconomic status. Efforts to increase preemptive transplantation must address disparities in access to this preferred treatment for kidney failure, which is especially important following the COVID-19 pandemic, which has disproportionately impacted racial and ethnic minority groups. Given that racial minority populations, including Black and Hispanic persons, are less likely to receive a PKT at kidney failure incidence despite having a higher burden of kidney failure, it is important to take these disparities into consideration when developing future policies and initiatives.

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SUDAN - POSTER FINALIST - RESEARCH Hussein J Ahmed, BCh MBBS

Incidence of Acute Pulmonary Embolism among Patients Hospitalized with COVID-19: A Systematic Review and Meta-analysis

Title

Incidence of Acute Pulmonary Embolism among Patients Hospitalized with COVID-19: A Systematic Review and Meta-analysis

Authors

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Introduction

Coronavirus disease 2019 (COVID-19) is a global pandemic which is associated with venous thromboembolism (VTE) and pulmonary embolism (PE). This study aimed to estimate the pooled incidence of PE among patients hospitalized with COVID-19 within the published literature.

Methods

This systematic review and meta-analysis was performed according to PRISMA guidelines. An electronic search using MEDLINE /PubMed, ScienceDirect, Cochrane, and OpenGray databases, conducted through May, 19th, 2020. Search terms included "COVID 19", "SARS-CoV-2", "coronavirus disease 2019", "2019-nCoV", "Wuhan coronavirus", "Pulmonary embolism", "pulmonary thromboembolism", "Pulmonary embol*", "pulmonary thrombo*" and "PE". Eligible studies included sufficient data to calculate the incidence of PE diagnosed during hospitalization in patients with COVID-19. Case reports were excluded. Quality was assessed using the Newcastle-Ottawa scale (observational cohort and case-control), AXIS tool (cross-sectional), and quality assessment tool (case series). Demographics and PE incidence data were extracted from the included studies and analyzed with R language. The pooled incidence of PE in patients hospitalized with COVID-19 was calculated.

Results

The database search identified 128 records. Ten observational studies were eligible and were included in the meta-analysis. With a total of 1722 patients (mean age= 63.36). The pooled PE incidence in patients hospitalized with COVID-19 was 17% (95% CI: 0.1-0.26). There was a high degree of study heterogeneity ($I2 = 94\%$, $p < 0.01$).

Conclusion

The pooled PE incidence in patients hospitalized with COVID-19 is 17%. This increased incidence is greater than that previously reported in the general population of non-COVID-19. Attention and further investigation of this risk is warranted.

TENNESSEE POSTER FINALIST - RESEARCH Brian M Cartwright

3,5 dihydroxy-7-methoxyflavone is synergistically cytotoxic with 5-Fluorouracil (5-Fu) in cell models of colorectal and pancreatic carcinoma while also protecting against 5-Fu off-target toxicity

Title

3,5 dihydroxy-7-methoxyflavone is synergistically cytotoxic with 5-Fluorouracil (5-Fu) in cell models of colorectal and pancreatic carcinoma while also protecting against 5-Fu off-target toxicity

Authors

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Introduction

Surgically unresectable colorectal and pancreatic carcinomas have a high rate of mortality as current treatment options are limited. One common chemotherapeutic used to treat these cancers is 5-fluorouracil (5-Fu); however, treatment typically only serves to slow the progression of the disease and comes with many side effects due to 5-Fu's intrinsic toxicity. Thus, strategies to decrease the amount of 5-Fu used in treatment as well as reduce its off-target toxicity are paramount not only to better treatment of colorectal and pancreatic carcinomas, but also to improve patient quality of life.

Methods

Using colorectal (HCT116) and pancreatic carcinoma (MiaPaca-2) cell lines, we investigated the efficacy of 5-Fu dose reduction when combined with 3,5 dihydroxy-7-methoxyflavone (Flavone B), a flavone previously found in our lab to be cytotoxic to these cancer lines (Ref 1). Additionally, differentiated or non-cycling cell models mimicking various normal tissue types were used to model the potential protective effect of Flavone B against 5-Fu induced off-target toxicity in the brain (SH-SY5Y), heart (H9C2), kidney (MDCK), and GI epithelium (CCD841 Con). Cell viability was assayed by MTT and the presence of apoptotic markers (c-PARP1, c-Casp3)

was determined by western blot analysis. DNA fragmentation assays for apoptosis were also performed.

Results

ComboSyn analysis of MTT data revealed that cotreatment with Flavone B and 5-Fu was synergistic and as efficacious as a dose of 5-Fu four-fold higher in both HCT116 and MiaPaca-2 carcinoma cell lines. These results were confirmed by western analysis of apoptotic proteins and by DNA fragmentation analysis. MTT and western data for off-target toxicity models showed an opposite profile in which less loss of viability, less induction of apoptosis, and less DNA fragmentation were seen.

Conclusion

Our studies show that Flavone B efficiently allows for 5-Fu dose reduction and has dual actions in vitro: 1) It works synergistically with 5-Fu to kill rapidly dividing cancer cells and 2) protects non-dividing and slower dividing cells from the toxicity of 5-Fu. While in vivo tests need to be performed, these results show promise for being able to not only better treat colorectal and pancreatic carcinomas, but also improve patient quality of life by reducing the off-target toxicity of 5-Fu.

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TEXAS POSTER FINALIST - RESEARCH Rohan Anand

Definitive Closure of a Ballistic Shotgun Injury with Extensive Soft Tissue Loss to the Right Thigh using ABRA Adhesive Dynamic Tissue System (DTS) and Porcine Urinary Bladder Matrix (PUBM)

Title

Definitive Closure of a Ballistic Shotgun Injury with Extensive Soft Tissue Loss to the Right Thigh using ABRA Adhesive Dynamic Tissue System (DTS) and Porcine Urinary Bladder Matrix (PUBM)

Authors

Rohan Anand, Jasmin Rahesh, Virginia Tran MD, Yana Puckett MD, Robyn Richmond MD FACS, Catherine Ronaghan MD FACS

Introduction

Buckshot ballistic injuries have unique wounding characteristics, resulting in especially formidable and destructive wounds at close range. The pellets cause an anatomic defect with necrotic tissue and heavy bacterial contamination. The ABRA adhesive Dynamic Tissue System (DTS) closure device provides noninvasive closure of retracted skin defects. Porcine urinary bladder matrix (PUBM) is an acellular matrix product derived from the inner lining of the porcine urinary bladder that imparts constructive remodeling and possible antimicrobial properties.

Methods

We present a case of a 37-year old male who sustained a close-range shotgun wound to the right lateral thigh. Definitive wound closure was achieved using a combination of dynamic tension and a biologic xenograft. Data and information were collected via chart review of EMR at University Medical Center from the initial ER visit, intrahospital course, and post-operative care.

Results

A 37-year old male with no past medical history sustained a close-range shotgun wound to the right lateral thigh. There was extensive soft tissue loss, but no bony, major vascular, or neurologic injuries. The patient was immediately taken to the OR for extensive debridement of nonviable skin, fascia, and muscle. A negative pressure wound therapy (NPWT) device was applied. Postoperatively despite narcotics, the patient was in worse pain than at the initial time

of presentation, likely due to the NPWT. Thus he was returned to the OR on post injury day (PID) 2 for removal of the NPWT, additional debridement of soft tissue, and installation of the ABRA adhesive DTS closure device (6 elastomers). After installation, the width decreased from 8 to 2 cm, and the muscle extrusion decreased from 2 cm above the skin to 1 cm below the skin. The 21 cm length and 9 cm blast injury cavity depth remained unchanged. On PID 6, examination of the wound in the OR revealed a maximum width of 1 cm, and it was deemed feasible to proceed with definitive wound closure. Micromatrix 500 mg was implanted into the blast cavity, along with a portion of the Cytal wound matrix sheet. The remainder of the wound matrix sheet was implanted throughout the bidirectional vertical mattress dermal closure. The patient was discharged home on PID 7.

Conclusion

Close range ballistic buckshot injuries cause extensive local tissue destruction. In addition to the pellets, wadding, gunpowder, and foreign bodies such as wood or cloth can be blasted into the wound. The ABRA adhesive DTS closure device utilizes elastomers to create dynamic tension across the soft tissue defect, resulting in decreased wound volume dimensions. The PUBM extracellular matrix is a substrate that serves as the site for cell attachment, migration, proliferation, and differentiation, allowing for deposition of host site-appropriate tissue. This case highlights a particularly extensive ballistic buckshot soft tissue injury. Due to the patient's intolerance of the NPWT, the combination of the ABRA adhesive DTS closure device and PUBM allowed for definitive closure of this complex wound in four days, minimizing patient morbidity. Further research into impact on length of stay, overall cost savings, and long-term patient outcomes are warranted.

TEXAS POSTER FINALIST - RESEARCH Nelson D Gonzalez

A 3- and 6- Month Follow-Up to a Student-Led Approach to Patient Safety in Pre-Clinical Curriculum

Title

A 3- and 6- Month Follow-Up to a Student-Led Approach to Patient Safety in Pre-Clinical Curriculum

Authors

Nelson Gonzalez, MPH, Sahar Panjwani, Daniel Nwosuocha, Lauren Bayliss, Ayleen Godreau, MD, MPH

Introduction

Preventable medical errors are currently the third leading cause of death in the United States following heart disease and cancer (1). In light of this, integration of formal patient safety education into undergraduate medical education has been encouraged by the World Health Organization in order to address issues of quality of care (2). Early exposure of medical students to patient safety knowledge may lead to them delivering safer care in their clerkship and residency years. This study aimed to assess the change in patient safety knowledge, attitudes, and beliefs in students after early exposure and education to patient safety during pre-clinical years.

Methods

A patient safety training was conducted for interested first and second-year medical students and responses were assessed through a pre-test, immediate post-test, 3-month post-test, and 6-month post-test. The survey assessed student knowledge on aspects of patient safety, identifying the correct course of action in different scenarios concerning patient safety, and Likert scale questions assessing if the training influenced students' desire to learn about patient safety. Students were also able to discuss real case scenarios and learn about clinical best practices in an interactive segment with physicians. RStudio was used to perform summary statistics and chi-square tests to compare the pre- and post- tests.

Results

Of the original 23 first- and second-year medical students, 12 and 7 students completed the 3-month and 6-month post-tests, respectively. Data showed improvement in students considering themselves to be well-versed in different aspects of patient safety in the 3-month

post-test (33.3%; p-value=1.00) compared to the pre-test training (11.8%) but declined in the 6-month post-test (14.3%; p-value=1.00). The percent of students that agreed they plan to incorporate patient safety techniques into their future practice was 83% in the 3-month post-test (pre-test: 94.1%; p-value=1.00) and 100% in the 6-month post-test (p-value=1.00). Compared to the pre-test (94.1%), there was no change in responses to the statement that patient safety can have a large impact on patient health outcomes (91.7% for 3-month post-test; p-value=1.00 and 100% for 6-month post-test; p-value=1.00).

Conclusion

The improvement in students who considered themselves to be knowledgeable about patient safety 3 months after the training is promising, despite the results of the 6-month post-test, as it highlights the need for long-term training. The lack of statistically significant findings can most likely be attributed to small sample size. The high percentage agreement to incorporate patient safety techniques and in understanding that patient safety can have an impact on patient health outcomes is encouraging. This indicates the long-term influence that patient safety training can have in preclinical years and potentially in clerkship years.

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TEXAS POSTER FINALIST - RESEARCH Katherine G Holder

The Effect of COVID-19 on Immunity, Inflammation, and Mitochondrial Function

Title

The Effect of COVID-19 on Immunity, Inflammation, and Mitochondrial Function

Authors

Katherine Holder, Bernardo Galvan, Hemachandra Reddy Ph.D., FAAAS and FANA

Introduction

In the last months of 2019, a novel coronavirus now known as COVID-19 spread from Wuhan, China and engulfed the globe causing illness, economic collapse, and almost 1.5 million deaths to date. Data from the global outbreak supports that COVID does not affect all patient populations equally, causing asymptomatic infection in some and leading to critical illness with respiratory failure, shock, and multiple organ dysfunction in others1. This study examines the impact of COVID-19 on immunity and mitochondrial function and provides a possible mechanism for disease severity in the immunocompromised.

Methods

Strict procedures were followed to ensure a comprehensive, high-quality literature review was performed over all available data. First, a comprehensive search of peer reviewed papers was performed based on broad key terms including: COVID-19, ACE-2, coronavirus, mitochondria, inflammation. Second, the references for each article were inspected and reviewed for integrity and usefulness to this investigation. In total, the search uncovered 42 articles relevant to this study all published between 2012 and 2020.

Results

COVID-19 mortality rates increase with patient age and chronic diseases, making the sick and elderly most susceptible to severe infection2. Chronic inflammation is prevalent in patients with age-related diseases, contributing to the relationship between severe COVID-19 infection and comorbidities2,3. Aging itself is associated with chronic, baseline inflammation, sometimes called inflamm-ageing4. Elevated baseline inflammation may aggravate or cause intrinsic defects in T cells and B cells via mitochondrial disinhibition, decreasing the body's ability to respond to infection4.

At the cellular level, COVID-19 can invade and critically inhibit mitochondria via the ACE-2 receptor, contributing to disease progression and severity5,6. Mitochondria perform crucial functions in regulating innate and adaptive immune response, development, and differentiation7. Mitochondrion alter cellular respiration to effectively adapt macrophage response between proinflammatory and anti-inflammatory phenotypes7. Since mitochondria are the chief cellular regulators of oxidative homeostasis, increased inflammation may lead to platelet damage and apoptosis as a result of mitochondrial dysfunction6.

In healthy patients, mitochondrial turnover through mitophagy, an auto-phagocytic process, is critical for maintaining proper cellular functions5. Mitochondria are constanly undergoing fusion and fission in a process of dynamic equilibrium6,8. Fusion and fission, which involve mitochondria merging and dividing respectively, maintains mitochondrial number, morphology, and function30. In healthy patients, fusion and fission occur at similar rates9. In COVID-19 patients, new and compelling evidence suggests that mitochondrial fission is inhibited while fusion is promoted, causing mitochondrial elongation and providing a receptive intracellular environment for viral replication9. COVID induced disruption of mitochondrion dynamic equilibrium effectively inhibits mitochondrial autophagy9. This increases oxidative stress, promotes mitochondrial dysfunction and can impair the body's immune response to COVID-196.

Conclusion

This study offers a possible mechanism for the increased severity of COVID-19 infections in patients with pre-existing age-related diseases and inflammation. The novel coronavirus may disrupt the dynamic equilibrium of mitochondria, subsequently impairing immune response. In patients where existing inflammation diminishes mitochondrial and immune function, COVID-19 infection proves to be exceptionally detrimental. This information may be useful in developing targeted therapies for COVID-19.

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TEXAS POSTER FINALIST - RESEARCH Hyun Jung

The Effects of an Interactive Nutrition and Cooking Skills Intervention at a Federally-qualified Health Center in Central Texas

Title

The Effects of an Interactive Nutrition and Cooking Skills Intervention at a Federally-qualified Health Center in an Urban Low-income Minorities Neighborhood

Title

The Effects of an Interactive Nutrition and Cooking Skills Intervention at a Federally-qualified Health Center in Central Texas

Authors

Hyun Jung, Steven H. Kelder, Freya Spielberg

Authors

Hyun Jung, Steven H. Kelder, Freya Spielberg.

Introduction

Suboptimal diet is a modifiable risk factor that affects both short and long term health. About a half of U.S. adults have one or more preventable chronic diseases related to poor-quality dietary patterns or physical inactivity, both of which disproportionately affect low-income and underserved communities. Previous interactive cooking skills interventions have shown positive effects on food literacy, confidence on cooking, fruit and vegetable consumption. While such interventions have been implemented in low-income settings, the implementations and evaluation of these interventions on both low-income and predominantly ethnic minorities neighborhoods are yet to be explored.

Introduction

Suboptimal diet is a modifiable risk factor that affects both short and long term health. About a half of U.S. adults have one or more preventable chronic diseases related to poor-quality dietary patterns or physical inactivity, both of which disproportionately affect low-income and underserved communities. Previous interactive cooking skills interventions have shown positive effects on food literacy, confidence on cooking, fruit and vegetable consumption. While such interventions have been implemented in low-income settings, the implementations and

evaluation of these interventions on both low-income and predominantly ethnic minorities neighborhoods are yet to be explored.

Methods

A 6-week interactive nutrition and cooking skills education was offered free-of-charge to patients and non-patients at a federally-qualified community clinic between 2017 and 2019. The curriculum was developed and instructed by registered dietitians and consisted of general nutrition lessons followed by hands-on cooking applying the concepts of balanced nutrition and healthier cooking methods. All participants completed surveys on the first and last session reporting their demographic data, nutritional knowledge and self-efficacy, and course experience. Health outcomes including BMI, blood pressure, hemoglobin A1C, blood glucose, total cholesterol, LDL cholesterol, and HDL cholesterol were retrospectively extracted from the electronic health records. The change in participants' reported nutritional knowledge and self-efficacy after the intervention was analyzed using chi-square and qualitative analyses. The change in health data was analyzed using paired t-test analyses.

Results

Between 2017 and 2019, 469 participants enrolled in the intervention; 301 (64.2%) participants completed 5 out of 6 sessions and were considered for further analyses. Most respondents were Hispanic White (63.3%), female (87.2%), mean age of 51, first time taking a nutrition course (87.6%), and had 1 or more underlying chronic condition (78.8%). The participants reported statistically significant improvement in their abilities to identify healthy ingredients and understand nutrition labels, and in their self-efficacy to modify recipes to cook foods healthier and make better choices when dining out (p

Conclusion

The interactive model of nutritional cooking education programs had positive impacts on improving knowledge and self-efficacy of participants to achieve healthier dietary and cooking behaviors among the residents of a predominantly Hispanic, low-income neighborhood. Further research is needed to measure the impact of such interventions on the short- and long-term health outcomes.

TEXAS POSTER FINALIST - RESEARCH Jasmin Rahesh

Neurosurgical Thoracolumbar Wound Complicated by CSF Fistula Open for 29 Days, Achieved Definitive Sutureless Closure Within 12 Days After Implantation of Porcine Urinary Bladder Matrix

Title

Neurosurgical Thoracolumbar Wound Complicated by CSF Fistula Open for 29 Days, Achieved Definitive Sutureless Closure Within 12 Days After Implantation of Porcine Urinary Bladder Matrix

Authors

Jasmin Rahesh MS MBA, Rohan Anand MBA, Yana Puckett MD, Robyn Richmond MD, FACS, Catherine Ronaghan MD, FACS

Introduction

Porcine urinary bladder matrix (PUBM) is a xenograft used for surgical reinforcement and management of soft tissue wounds at high risk of poor wound healing. PUBM is an acellular matrix product derived from the inner lining of porcine urinary bladder that imparts constructive remodeling and possible anti-microbial properties. We present a challenging case of a thoracolumbar wound secondary to laminectomy complicated by a cerebral spinal fluid (CSF) fistula managed successfully with PUBM.

Methods

We present a case of a 23-year-old white female with achondroplasia who initially underwent laminectomy for a World Health Organization (WHO) grade I ependymoma extending from thoracic vertebrae 10 to sacral segment 1. After initial laminectomy the patient was returned to the operating room by neurosurgery 19 days after the index operation for a wound infection and cerebrospinal fluid fistula. The patient was taken to the operating room for wound debridement and implantation of PUBM 3 days after surgical wound care consultation (29 days after initial wound issues were documented). Examination of the wound revealed areas of fat necrosis, fibrinous exudate, and dermal dehiscence. The resulting common defect measured 22 cm in length with maximum width of 4 cm, a depth of 2 cm cephalad, which progressed to a maximum depth of 6.5 cm near the caudad portion of the wound. There was clear fluid emanating from the sacral area. The porcine urinary bladder matrix was implanted first with 500 mg of MicroMatrix, followed by a three-layer Cytal 10 x 15 cm wound sheet. No sutures

were used in the dermal closure, the skin edges were apposed with strips of vac drape tape only.

Results

This case highlights definitive closure of a chronic 29-day old wound with a CSF fistula within 12 days of PUBM implantation and sutureless skin edge apposition. Presence of a CSF fistula increases the risk of meningitis, excludes the use of negative pressure wound therapy, often requires prolonged antibiotic therapy and hospitalization. Early intervention with this technique in future cases could potentially decrease length of stay and greatly reduce healthcare costs.

Conclusion

This case highlights the efficacy of PUBM with an active CSF fistula in a large chronic thoracolumbar surgical wound. This material accelerated wound healing and facilitated discharge 3 days after implantation.

TEXAS POSTER FINALIST - RESEARCH Ryan Wealther

Fostering Clinicians' Comfort in Leading Goals of Care Conversations: An Evaluation of the Veterans Affairs' Life-Sustaining Treatment Decisions Initiative

Title

Fostering Clinicians' Comfort in Leading Goals of Care Conversations: An Evaluation of the Veterans Affairs' Life-Sustaining Treatment Decisions Initiative

Authors

Ryan Wealther, BS; Jenna C Fraser, MD; Kelly Ferraro, MD; Jennifer Healy, DO

Introduction

About half of physicians regularly seeing patients aged 65 and older feel unprepared to facilitate advanced care planning with their patients, which underscores the need to identify interventions designed to increase comfort and knowledge with end-of-life care. The Veterans Affairs' (VA) Life-Sustaining Treatment Decisions Initiative (LSTDI) aims to ensure that the values, goals, and life-sustaining treatment decisions of veterans with serious illnesses are honored. LSTDI includes mandatory goals of care conversations (GOCC) training for clinicians. The goals of this study were to evaluate the effectiveness of LSTDI at the South Texas Veterans Health Care System (STVHCS) and determine if comfort with GOCC correlates with performance.

Methods

Clinicians attended a 1.5-hour interactive GOCC training highlighting communication techniques and the REMAP framework for GOCC. Clinicians were given an 11 item survey assessing comfort with various dimensions of GOCC prior to and after the training. The McNemar exact conditional test was used to assess if the training changed the proportion of clinicians who agreed to each item (a=0.05). Several months later, trainees participated in a GOCC Observed Skills Clinical Evaluation (OSCE). Spearman’s rank correlation coefficient was calculated to determine if there was a correlation between comfort with GOCC and OSCE performance (a=0.05).

Results

28 participants completed both the pre- and post-surveys, and 14 participated in the OSCE. Each item on the post-survey indicated increased comfort with GOCC; 6 out of 11 items indicated significantly increased comfort with GOCC. The Spearman’s rank correlation

coefficient between level of agreement with post-survey item “I feel comfortable discussing GOC with my patients” and total OSCE score was rs=0.63 (N=14; p=0.017), which indicates a strong, positive monotonic correlation.

Conclusion

The VA’s LSTDI increased comfort with various dimensions of GOCC at STVHCS. In addition, comfort with GOCC positively correlated with OSCE performance. The post-survey may serve as a useful predictor of GOCC performance. Implications for further research include replicating the intervention on a larger scale and evaluating effectiveness in other settings.

TEXAS POSTER FINALIST - RESEARCH Jeffrey Xia

Second-line tyrosine kinase inhibitors (TKIs) versus immunotherapy (IO) for advanced hepatocellular carcinoma (HCC): Real-world efficacy and safety analysis in patients with varying liver dysfunction

Title

Second-line tyrosine kinase inhibitors (TKIs) versus immunotherapy (IO) for advanced hepatocellular carcinoma (HCC): Real-world efficacy and safety analysis in patients with varying liver dysfunction

Authors

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Introduction

Within the last four years, the FDA has approved five medications as second-line therapies for advanced HCC. At our cancer center, the majority of our patients are Hispanic with varying liver dysfunction, and this real world population is not fully represented in registration trials of TKIs and IOs. Therefore, we analyzed survival and toxicities among second-line therapies for HCC at our Hispanic-majority NCI-designated cancer center.

Methods

Retrospective analysis of patients with advanced HCC diagnosed at Mays Cancer Center from January 2015 to March 2019 who received second-line therapies, including IO (i.e. nivolumab), TKIs (i.e. cabozantinib, regorafenib), or hospice/best supportive care (BSC). Progression-free survival (PFS) was determined using Kaplan-Meier method, and hazard ratios estimated with Cox proportional hazards model. Adverse events (AEs) according to Common Terminology Criteria for AEs v5.0 (CTCAE v5.0) were analyzed with Fisher's exact test.

Results

Of the patients receiving first-line therapy, the median age was 60 years (n=65), and patients were 75% (n=49) Hispanic. 58 (89%) patients went onto receive second-line therapy. Child-Pugh (CP) scores as percentage of the cohort were as follows: A 17%, B 55%, C 28%. Median PFS was 3.1 months with TKI (n=6), 3.3 months with IO (n=27), and 1.3 months with BSC (n=25). There

was improved survival with IO when compared to BSC (HR 3.26, 95% CI 1.58 to 6.72, p=0.00136). There was no significant difference when comparing IO to TKI (HR=0.94; 95% CI: 0.31-2.86; p=0.92), but a trend to improved PFS with TKI when compared to BSC (HR=3.08; 95% CI:0.96-9.84; p=0.06). For adverse events, the TKI group had significantly more rash (p=0.01) and hand-foot syndrome (HFS) (p

Conclusion

In our Hispanic-majority cohort, patients with varying liver dysfunction, including CP B & C cirrhosis, were more likely to receive IO or BSC. Both second-line treatment groups (IO or TKI) had increased mPFS compared to BSC. Both IO and TKI groups were tolerable compared to BSC, with expected toxicity per class of drug. More prospective studies comparing second-line agents should be done in patients with varying liver dysfunction to understand survival, tolerability, and quality of life.

VERMONT POSTER FINALIST - RESEARCH Alexa K Pius

Medical Student COVID-19 Action Network (MSCAN) enables collaborative student response to the COVID-19 pandemic

Title

Medical Student COVID-19 Action Network (MSCAN) enables collaborative student response to the COVID-19 pandemic

Authors

Alexa K Pius, BS; Vinh H Le, BS; Samuel J Aldous, BS; Cyrus N Thomas-Walker, MS; Ashta Narain, BS, Charles D MacLean, MD

Introduction

The COVID-19 pandemic widely disrupted medical education, prompting medical schools across the United States to adjust their curricula in both clinical and preclinical settings. In the wake of the suspension of clinical activities, medical students nationwide began organizing service projects addressing community needs, such as childcare for healthcare workers on the front lines and the collection of personal protective equipment (PPE) for hospitals and clinics. The goal of this project was to catalogue the quantity and types of volunteer organizations created by medical students in response to COVID-19.

Methods

A group of 21 students at the Larner College of Medicine founded the Medical Student COVID-19 Action Network (MSCAN) to share initiatives, increase collaboration across schools, and catalogue activities. We surveyed U.S. allopathic and osteopathic medical schools, requesting a complete listing and description of student COVID-19 response activities. Follow-up was sent at 10 days to non-respondents, with further follow-up via personal contacts as needed to maximize data completeness. All data were collected from March 25 to June 12, 2020. A database, website, and digital interactive map were generated, and are updated daily.

Results

The MSCAN project received survey responses from 101 allopathic (71% response rate) and 11 osteopathic (37%) medical schools across 42 states, Washington D.C., and Puerto Rico. A total of 545 service activities were documented. “Resource Production and Acquisition” was the most common activity, representing 18% of all activities. This category included PPE drives and other activities, such as a Salvation Army drive at Mercer University and 3D printing of masks

and face shields at Vanderbilt University. The next most common category, “Food Services”, represented 8% of all activities. Other activities performed by medical students were very diverse, including a letter writing campaign to foster connection with vulnerable populations (“Writing”), free online tutoring (“Academic Tutoring”), and providing a podcast to update the local community on COVID-19 information (“Arts, Media, and Entertainment”). The website has posted 31 videos and had over 9,000 views as of August 16, 2020.

Conclusion

The MSCAN project was successful in surveying, documenting, and cataloguing the contributions of U.S. medical students during the COVID-19 pandemic. It is our hope that MSCAN will serve as a resource for health professions students across the nation and enable a collectively stronger response to current and future healthcare crises.

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https://publichealthcoalition.org/

VIRGINIA POSTER FINALIST - RESEARCH Matthew Cabrera

Outcomes of Patients with COVID-19 ARDS Treated with Prone Positioning, Infusion of Neuromuscular Blocking Agents, and Administration of Inhaled Vasodilators

Title

Outcomes of Patients with COVID-19 ARDS Treated with Prone Positioning, Infusion of Neuromuscular Blocking Agents, and Administration of Inhaled Vasodilators

Authors

Matthew Cabrera(1), Sarika Bharil(1), Sameer Desale(2), Meghan Chin(1), Zaki Ahmed(1), Paul Clark, D.O.(3), Seife Yohannes, M.D.(3) 1. Georgetown University School of Medicine 2. Medstar Health Research Institute 3. Department of Critical Care, Medstar Washington Hospital Center

Introduction

A major cause of mortality in Coronavirus disease 2019 (COVID19) is Acute Respiratory Distress Syndrome (ARDS). Currently, moderate to severe ARDS induced by COVID19 (COVID ARDS) is treated by traditional ARDS protocols that recommend 12-16 hours of proning (Pr), Neuromuscular Blocking Agents (NMBA), and a trial of inhaled Epoprostenol (iEPO) if oxygenation does not improve. However, debate on whether COVID ARDS is an atypical form of ARDS persists and evidence about the benefits of iEPO/NMBA is sparse. In our multi-center retrospective review, we evaluated iEPO/NMBA's impact on outcomes and lung mechanics in proned intubated COVID ARDS patients.

Methods

Charts of 163 consecutive patients admitted to the intensive care unit (ICU) at Medstar Washington Hospital Center and Georgetown University Hospital between 03/01/2020 and 06/30/2020 were retrospectively reviewed. Inclusion criteria consisted of intubated patients on a ventilator diagnosed with COVID ARDS. Primary outcomes included mortality, hospital length of stay (LOS), intensive care unit length of stay (ICU LOS), use of extracorporeal membrane oxygenation (ECMO), and discharge status. Secondary outcomes included changes in P/F ratio, plateau pressure (Pplat), lung compliance, driving pressure, and O2 index. Primary outcomes and therapies administered were manually recorded by medical students. Subject's arterial blood gas and ventilator parameters were electronically extracted pre-intervention and at 24 hour intervals. For primary outcomes categorical data and continuous variables were statistically analyzed using Fisher's exact test and the non-parametric Kruskal Wallis test,

respectively. A mixed effect model was used to compare secondary outcomes at different time points and between groups.

Results

For our primary outcomes, 84 subjects were assigned to Pr (N=20), Pr/iEPO (N=30), or Pr/iEPO/NMBA (N=34) based on administration of a therapy at any point in their ICU course. NMBA was defined as continuous infusion only. 79 subjects were excluded because they lacked proning documentation or were ventilated for

Conclusion

No significant benefits in patient outcomes or consistent improvements in physiologic parameters were found with the administration of iEPO. Continuous infusion of NMBA was associated with a longer LOS without a significant improvement in lung mechanics. Limitations include that our study was retrospective and therapy durations were non-standardized. Future research should aim to confirm if there is a benefit in administering iEPO and/or NMBA to proned COVID ARDS patients.

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VIRGINIA POSTER FINALIST - RESEARCH Jonathan Davidow

Monitoring Mental Health after COVID-19: Employing the PHQ-9 to screen for depression during a student-run post-hospitalization QI project

Title

Monitoring Mental Health after COVID-19: Employing the PHQ-9 to screen for depression during a student-run post-hospitalization QI project

Authors

Jonathan Davidow, MS3 BronxCare/AUCSOM Sophia Seik-Ismail, MS3 BronxCare/AUCSOM William Velasquez, MS3 BronxCare/AUCSOM Girish Swaminath, MS3 BronxCare/AUCSOM

Introduction

The mental health impacts on those recovering from COVID-19 certainly extend well beyond the wards. The experience of the physical disease is compounded by social isolation, personal uncertainties, and social instability. Patients who were treated inpatient and discharged home to the community are expected to be at a significantly increased risk of depression due to the myriad stressors surrounding and including their hospitalization. We employed a primary care screening tool to assess for depression symptoms while conducting a Quality Improvement survey of a patient population in the South Bronx. Our aim was to both evaluate the mental health impacts of COVID-19 on our community and to ensure patient safety and mental health during these unprecedented times.

Methods

We utilized the PHQ-9 depression screening tool to evaluate for symptoms while surveying patients during a post-hospitalization QI project between May 6, 2020 and June 17, 2020. Medical students acting as surveyors were trained by clinical educators to appropriately screen patients and handle any significant mental health concerns that came up such as suicidal ideation. We developed appropriate data collection and referral pathways for any concerning totals.

Results

The PHQ-9 screening was completed by 99 patients over the course of the project. 32.3% of patients scored greater than a four (4), suggesting that they may benefit from psychiatric evaluation. 10.1% of patients scored 10 or greater, which has been validated by Arroll, et al to be 91% specific and 74% sensitive in detecting Major Depressive Disorder (MDD). In our

screening, scores of 10, defined as the lower end of the moderate depression severity range, initiated referral for follow-up, which was accepted by eight (8) patients.

Conclusion

Through our quality improvement project, we were able to identify and refer for evaluation eight (8) patients, representing 8% of the patient population screened, who reported symptoms suggestive of Major Depressive Disorder in the weeks following their hospitalization for COVID-19. This can be compared to a recent Lancet retrospective analysis of over 62,000 COVID-19 positive patient records which found an 18.1% incidence of psychiatric diagnosis in the weeks after COVID-19 diagnosis and treatment. The mental health of people around the world must be followed as this pandemic and its aftereffects progress, especially those living in severely hard-hit areas or under social stressors which exacerbate the impacts of the pandemic. An acute hospitalization, despite the severity of disease or the treatments incurred, is known to correlate with psychiatric sequelae, and returning home during a pandemic comes with unique stressors, including mandated quarantine, general isolation, disturbance of normal routines, social and financial uncertainty, and loss of loved ones. Through this work we were privileged to take a snapshot of the mental health impact of this pandemic while also ensuring that patients most at risk were efficiently referred for evaluation and treatment. We envision future work to include an evaluation of the cultural salience of the PHQ-9 within our patient population and an exploration of factors such as minimization of symptoms due to stigma which may have impacted our totals.

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WASHINGTON POSTER FINALIST - RESEARCH Nobel Nguyen

Quantifying and Modulating Public Health Knowledge Gaps Amongst Physicians and Medical Students in a Pandemic

Title

Quantifying and Modulating Public Health Knowledge Gaps Amongst Physicians and Medical Students in a Pandemic

Authors

Nobel Nguyen, MSIII, Joshua Daniels, MSIII, Joy Lewis, DO, PhD

Introduction

The public health efforts to "flatten the curve" experienced some level of mixed messaging, especially as it pertains to the ever-changing CDC guidelines. Though people may obtain information from many sources (i.e. CDC, the news, and social media), physicians have always been a trusted source for public health information. Medical students, many quarantined back in their communities or homes, also became an important source of information amidst the widespread shelter-in-place orders. The goal of this project is to quantify the accuracy of medical providers COVID-19 public health-related knowledge during the nationwide public health response, and discover which area of confusion is most prominent.

Methods

This is a cross-sectional study that collected individual's responses at a single medical school institution in May 2020. Participants, who were either medical students or physicians, were invited to partake in this voluntary study. They were asked to complete an online survey, which included a participant profile section and a quantitative multiple-choice quiz. For the participant profile section, participants were asked if they were being used as a COVID-19 information source, what sources they used to obtain information, and how they disseminate the information. The quantitative quiz consists of five questions based on CDC COVID-19 official guidelines in May 2020 covering the topics: mask effectiveness, mask-wearing guidelines, SARS-CoV-2 transmission, testing priorities, "high-risk group" designation.

Results

In total, 144 respondents participated in this study, 101 were medical students and 43 were medical physicians. 60% were female, 38% were men, and 2% chose not to answer. 99% of participants stated they have discussed COVID-19 related guidelines and recommendations

with family/friends, and of those who said yes, 73% said family/friends turned to them as a source of information and expertise. The overall mean of the quiz score was 1.9 (38% correct), with medical students having a mean of 32%, and medical physicians having a mean of 50%. The topics displayed the following performance [overall, physician, student]: “high-risk group” designation [44%, 56%, 39%], “high priority group” for testing [43%, 56%, 38%], mask effectiveness [41%, 49%, 37%], mask-wearing guidelines [39%, 53%, 33%], SARS-CoV-2 transmission [20%, 36%, 15%].

Conclusion

In conclusion, our study revealed that medical providers, who many rely on for public health advice, displayed high levels of confusion regarding public health guidelines. Of the topics tested on, the specifics of transmission (infectious materials, incubation period, and viral shedding) proved to elicit the most confusion while the designation of high-risk comorbidities displayed the least. When choosing which information to prioritize, public health efforts should be focused on topics that display the highest levels of confusion. It is important that systems be in place for providers to be effectively updated with targeted COVID-guidelines, especially given the rapid changing of recommendations during the pandemic response and the behavioral nature of the intervention. By making providers better informed, we can better equip the general population with accurate information. In doing so, we can effectively help “flatten the curve” more effectively as this pandemic persists and as we think perspective toward the future.

WISCONSIN POSTER FINALIST - RESEARCH Aria Kenarsary

Clinical Characteristics and Outcomes of Prostate Cancer Patients Undergoing [F-18]fluciclovine PET/CT scan at UWMSPH – A Retrospective study

Title

Clinical Characteristics and Outcomes of Prostate Cancer Patients Undergoing [F- 18]fluciclovine PET/CT scan at UWMSPH – A Retrospective study

Authors

Aria Kenarsary, Hamid Emamekhoo MD, John Floberg MD, PhD.

Introduction

Rising prostate-specific antigen (PSA) after definitive therapy of localized prostate cancer (PC) such as radical prostatectomy (RP) or radiation therapy (RT) indicates disease (dx) recurrence. Determining local, regional, and/or distant sites of PC recurrence with conventional imaging such as CT or bone scan remains challenging. PSA rise without radiographic evidence of dx recurrence is called biochemical recurrence (BCR) [1,2,3]. Newer imaging modalities with higher sensitivity, such as [F-18]fluciclovine (Axumin) positron emission tomography (PET) scan, can detect a lower dx volume and have been shown to be a more sensitive modality for detection and localization of BCR compared to more conventional imaging modalities.

Methods

This single-center retrospective study included 84 patients (pts) who had Auxmin scan for BCR at the University of Wisconsin-Madison from 10/2017-10/2019 with at least 20 months follow-up. We aimed to evaluate the Axumin scan findings, treatment approach, and outcomes in PC patients (pts) at our institution. Clinical and pathological dx characteristics, imaging, treatment, and clinical outcomes data were collected via a review of the electronic medical records.

Results

Of the 84 pts, 94% were Caucasian, 4.8% African American, and 1.2% Hispanic. Median age at diagnosis was 64 (46–84 yo). The median interval between the initial PC diagnosis and Axumin scan was 34 months (1-345-months). Complete data was available for review on 79 scans. The most common indication for obtaining an Axumin scan included: BCR following RP (35, 44.2%), BCR following initial RT (18, 22.8%), BCR following RP & salvage RT (7, 8.9%), BCR following RP & adjuvant RT (3, 3.8%), initial diagnosis (9, 11.4%), and other indications (7, 8.9%). Auxmin findings included: 19 negative (Neg) scans (24.0%), 49 positive (Pos) (62.0%), 10 with equivocal

findings (12.7%), and 1 unknown (1.3%). 17 pts with Pos/equivocal findings underwent biopsy (bx) which resulted in 12 Pos bx confirming PC (70.6%), 3 Neg bx (17.6%), 1 non-diagnostic bx (5.9%), and 1 with unknown results (5.9%). Of the pts who received additional therapy following Axumin scan, 42 pts received RT, 2 pts had surgical resections of the Pos Auxmin lesions, and 3 pts who had Axumin scan at initial diagnosis received systemic treatment for metastatic dx.

Conclusion

This study was a descriptive analysis of PC patients who received Auxmin PET scans at our institution. This will serve as a foundation for future studies investigating the prognostic utility of Axumin scan in BCR of PC. Since PET provides inherently quantitative physiologic information about a cancer, the purpose of future work is to determine if quantitative imaging metrics derived from PET scans provide any prognostic value in patients with biochemically recurrent prostate cancer being treated with salvage therapy with a goal of cure.

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WISCONSIN POSTER FINALIST - RESEARCH Srisha Kotlo

Serum Humanin Levels are Inversely Associated with Body Mass Index and Systemic Measurements of Microvascular Function

Title

Serum Humanin Levels are Inversely Associated with Body Mass Index and Systemic Measurements of Microvascular Function

Authors

Srisha Kotlo (1), Mamatha Kakarla (2), Michael Widlansky (2) 1) Medical College of Wisconsin, Milwaukee, WI 2) Department of Medicine, Division of Cardiovascular Medicine, Medical College of Wisconsin, Milwaukee, WI

Introduction

Individuals with type 2 diabetes mellitus (T2DM) have high vascular complication rates. Humanin, a mitochondrial peptide that is expressed in endothelial cells of blood vessels, is known to be lower in the circulation of humans with T2DM. Humanin levels are positively correlated with coronary microvascular function in humans without T2DM. Associations between circulating humanin levels and peripheral conduit and microvascular function remain unknown. Endothelial health can be assessed by brachial artery flow-mediated dilation (FMD). Our objective was to quantify humanin levels in serum from control and T2DM subjects and determine correlations between circulating humanin levels, FMD, and microvascular function as represented by flow in the brachial artery. We hypothesized that humanin levels are positively correlated with FMD, brachial artery resting flow, and hyperemic flow.

Methods

This study included individuals who participated in a prior research study in which they completed vascular measurements and signed a banking consent for storage of serum samples. Vascular measurements were recorded and kept in an online database. Among the 39 subjects, 21 were control (10 men, 11 women) and 18 had T2DM (9 men, 9 women). Serum humanin concentration was measured by a commercial ELISA kit (MyBioSource). Correlation tests were performed to evaluate humanin and FMD data. Unpaired t-tests were used to evaluate differences in humanin levels among the different groups.

Results

T2DM subjects had lower serum humanin than controls (P

Conclusion

In contrast to humans without T2DM, humanin levels may negatively correlate with microvascular function in T2DM patients. The mechanistic implications of this finding remain unclear and merit further investigation.

WISCONSIN POSTER FINALIST - RESEARCH Thomas Y Luo

Implementation of a Digital Strategy for Community-Based COVID-19 Clinical Trial Recruitment

Title

Implementation of a Digital Strategy for Community-Based COVID-19 Clinical Trial Recruitment

Authors

Thomas Luo, Medical College of Wisconsin, Milwaukee, WI; Tom Jiang, PharmD, Ernest Mario School of Pharmacy, New Brunswick, NJ

Introduction

Two-thirds of clinical trials never meet their enrollment goals. Not only do patients lose the opportunity to undergo life-altering therapies, but also patients with lower socioeconomic status or without access to large academic medical centers are disproportionality impacted. In particular, African American patients are 5.7 times more likely to die from COVID-19 in Wisconsin, while making up less than 20% of major clinical trial cohorts. Concurrently, the prominence of COVID-19 trials has revealed a need to address gaps in knowledge about the benefits and risks of participating in experimental treatments; the urgency to engage patients in clinical trials has never been greater. Available online trial-matching tools require either extensive collection of patient information or the advanced medical knowledge to interpret. To address these barriers to access, our team seeks to develop an anonymous web-based search tool for patients to discover clinical trials for COVID-19 with unintimidating language adapted by healthcare professionals.

Methods

After observing many physician-patient trial recruitment conversations, we compiled the information that patients most often request to make an informed decision. Information from selected clinical trials was extracted from the clinicaltrials.gov database. Complex concepts, such as mechanism of action and prior clinical safety data, were distilled into a unique library of easily understood concepts, completely eliminating medical jargon. We created a simple search engine website and distributed it using social media. Information regarding COVID-19 convalescent plasma and vaccine development efforts was subsequently launched to improve patient education.

Results

At the peak of the COVID pandemic, the website received 2,400 and 2,800 views in the months of April and May of 2020, respectively. Of the individual study pages, information regarding hydroxychloroquine studies and plasma donation received the most unique views, which aligned closely with national coverage of these topics. On average, user visited two pages prior to leaving the website. No identifying information was collected to protect patient privacy.

Conclusion

A patient-centered clinical trial recruitment strategy can alleviate disparities in clinical trial recruitment. We identified privacy and ease-of-use as pillars to developing a best-in-class solution. Continuing to engage patients and tracking the impact of our website remains a challenge with an anonymous platform. Finding invested community partners would draw a more stable group of users and allow survey-based patient feedback—invaluable to improving the design of the website and the addition of more features.

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WISCONSIN POSTER FINALIST - RESEARCH Vincent Renta

The Relationship between Social Capital and Hypertension in Two African Countries

Title

The Relationship between Social Capital and Hypertension in Two African Countries

Authors

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Introduction

Africa has seen a shift in its burden of disease from infectious to non-communicable diseases (NCDs) coupled with the largest increase in chronic disease incidence worldwide.1,2 Hypertension and its related diseases are estimated to be responsible for over a third of total NCD deaths.3,4 Several positive behaviors and social determinants of health such as social capital have been linked to lower odds of NCD development.5 Previous studies have largely focused on interactions between social capital, health behaviors, and cognitive health.5,6 There is a lack of information on the association between social capital and NCDs, specifically in Africa and the degree to which, if any, sociodemographic factors influence the relationship. Thus, we sought to examine the relationship between social capital and hypertension among adults in Ghana and South Africa, and to compare the relationship across urban and rural environments.

Methods

9,800 adults were analyzed from the Study on Global Ageing and Adult Health (SAGE) Wave 1 individual data files for Ghana and South Africa, administered from 2007 to 2010. Outcomes were self-reported hypertension, measured hypertension (>=140/90, systolic, and diastolic), and undiagnosed hypertension. The primary independent variable was social capital, which was dichotomized into low vs. medium/high levels of social capital. Covariates included age, gender, income, marital status, education, area of residence, work status, and comorbidities. Preliminary analysis included descriptive statistics to understand sociodemographic differences between South Africa and Ghana. Interaction terms were tested between social capital and rural/urban residence status, with models stratified by rural/urban status if significant. Then

unadjusted and adjusted linear and logistic models were run separately for South Africa and Ghana for each outcome.

Results

There was a significant difference in the prevalence of self-reported hypertension by the level of social capital in South Africa and Ghana (p=140/90) (OR=1.35, 95% CI=1.18;1.55), have 3.25 mmHg increase in systolic blood pressure, 2.37 mmHg increase in diastolic blood pressure and were more likely to have undiagnosed hypertension (OR=1.25, 95% CI=1.08;1.44). Finally, after adjustment rural residents in Ghana with low social capital were more likely to have undiagnosed hypertension when compared to those with high/medium social capital (OR=1.44, 95% CI=1.19;1.78), while in urban areas the relationship was not significant.

Conclusion

This study found that the relationship between social capital and hypertension differed between South and West African countries. One implication is that in West Africa, lower social capital is associated with higher likelihood of having hypertension. Secondly, we found that the relationship between social capital and undiagnosed hypertension differed by area of residence with limited relationship in urban areas. Finally, this study brings to light the importance of having information on both self-reported and measured hypertension as there were differences by country and within a country, between measured and self-reported hypertension when investigating the relationship with social capital. Further analysis of the relationship in other countries is needed and investigation into the pathway through which low social capital is associated with hypertension outcomes in Ghana but not in South Africa.

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AMERICAN COLLEGE OF PHYSICIANS NATIONAL ABSTRACTS COMPETITIONS MEDICAL STUDENT – CLINICAL VIGNETTES

MICHIGAN PODIUM PRESENTATION - CLINICAL VIGNETTE Evan Brickner

Atypical Presentation of Functional Vitamin B12 Deficiency from Whippet Abuse

Title

Atypical Presentation of Functional Vitamin B12 Deficiency from Whippet Abuse

Authors

Evan Brickner, MS4* Patrick Herndon, MS3* Alexis Kerl, MS4* Adrian Michel, M.D.^ Francisco Davila, M.D.*^ *Oakland University William Beaumont School of Medicine, Rochester, Michigan ^Internal Medicine Department at Beaumont Health System, Royal Oak, Michigan

Introduction

Commonly known as “laughing gas”, nitrous oxide (N2O) is an anesthetic frequently used in medical and dental settings. It is also sold as “whippet” canisters for making homemade whipped-cream; however, whippets are commonly used as recreational drugs due to their rapid onset and euphoric, relaxant properties. High systemic levels of N2O can cross-react with vitamin B12 stores resulting in irreversible oxidation of the cobalt ion within vitamin B12, which causes inactivation of vitamin B12, an important coenzyme of methionine synthase and methylmalonyl-CoA mutase. These enzymes aid in the generation of important biomolecules including DNA, RNA, myelin, and heme. Therefore, inactivation of vitamin B12 may ultimately lead to a functional vitamin B12 deficiency and development of subacute combined degeneration (SCD) of the spinal cord, as well as macrocytic anemia.

Case Presentation

A 26-year old female with a history of anxiety and depression presented to the emergency department with paresthesias and ataxia. She initially experienced paresthesias in her toes and feet following a panic attack 2.5 weeks prior to admission, which progressively ascended to her legs, abdomen, and hands. She also reported worsening gait and multiple falls. Further history revealed that she began using whippets one year prior, but increased her usage to 100-150 canisters daily over the prior three months following an emotional, relationship breakup. The patient’s vitals were stable on arrival. Neurological exam showed absent vibratory and proprioceptive sensation to the knees, dysmetria on heel to shin testing, and preserved reflexes bilaterally. Laboratory investigations included: hemoglobin 12.3 g/dL, MCV 98 fL, unremarkable BMP, normal folate, and normal vitamin B12 level at 298 pg/mL (reference range 271-1,000 pg/mL). Urine drug screen tested positive for cannabinoids. CT head did not show any acute

intracranial process. An MRI of the entire neuraxis with and without contrast noted T2 signal changes in the dorsal column from C1 to T1 and associated edema, without contrast enhancement. SCD was suspected and the patient was started on vitamin B12 replacement. Days later, homocysteine levels >50 mcmol/L (reference range 4-10 mcmol/L) and methylmalonic acid at 2.50 nmol/mL (reference range = 0.40 nmol/mL) resulted, confirming the diagnosis of functional vitamin B12 deficiency. The patient participated in an intense, inpatient rehabilitation program for seventeen days. She was eventually discharged, able to walk 60 meters and climb 15 stairs with a rolling walker.

Discussion

This presentation of acute neurological symptoms following an emotional trigger was initially consistent with a primary psychiatric condition, such as conversion disorder. However, further investigations revealed a biological origin for her symptoms. Importantly, functional vitamin B12 deficiency needs to be suspected in patients with N2O use, particularly if initial blood levels of vitamin B12 are normal. A thorough social history including drug use is essential for initial suspicion of this disease process. Increased homocysteine and methylmalonic acid can yield the diagnosis, along with characteristic imaging findings for SCD. Vitamin B12 supplementation and intense physical rehabilitation are the main therapeutic modalities to try to reverse the disease course.

MICHIGAN PODIUM PRESENTATION - CLINICAL VIGNETTE
Nadine Elhage

Prolonged Muscle Paralysis associated Acetylcholinesterase Deficiency

Title

Prolonged Muscle Paralysis associated Acetylcholinesterase Deficiency

Authors

Nadine Elhage OMS-IV, Elizabeth Gheordunescu D.O, Michael Brennan D.O, Hunter Hayes, D.O. Ahmad Maarouf, M.D. Beaumont Hospital Trenton. Michigan State University College of Osteopathic Medicine.

Introduction

Acetylcholinesterase Deficiency is a rare autosomal recessive disorder occurring 1 in every 3,200-5,000 people. Usually presents as a persistent paralysis following surgery due to prolonged action of acetylcholine. There have been rare reports in the literature of such a phenomenon.

Case Presentation

A 70-year-old female was admitted to the hospital with L3 and sacral fractures secondary to a traumatic fall from standing one month prior. She reported non-radiating hip pain after the fall, denied numbness, tingling, bladder, or bowel incontinence. During her hospital stay, she also developed an acute kidney injury and hypokalemia, which resolved prior to surgery with appropriate treatment. The patient was optimized and prepped for surgery that occurred six days after admission. The patient was given succinylcholine 100mg and rocuronium 50mg for intraoperative paralysis. The surgery proceeded uneventfully. Post-operatively, it was noted that the patient did not have adequate twitch response as measured by train-of-four (TOF), indicating that she was still under the effect of paralytics. One dose of Sugammadex was given in the PACU to try and reverse the succinylcholine. The patient did not respond to the reversal agent and was transferred to the intensive care unit for further monitoring while mechanically ventilated. In the ICU she was given an additional dose of Sugammadex, totaling 200 mg, and was again noted to have less than two twitches as measured by TOF stimulation. She was also given a challenge using 5mg of neostigmine out of concern for new-onset MG crisis, possibly exacerbated intraoperatively. It was noted in the intensive care unit that her sedation wore off, so she was given propofol to comfort the patient. Over the next 12 hours, the patient slowly regained muscle function and was able to be extubated with no difficulties. The patient stated

that she remembers the events that happened post-operatively and was only paralyzed, which is a new phenomenon not seen in other literature with patients who had prolonged paralysis. Acetylcholine receptor antibodies (AChR)were obtained and found to be less than 0.3 (units), which was in the range of negative, effectively ruling out a potential diagnosis of myasthenia gravis. In consultation with the neurology service, her diagnosis was acetylcholinesterase deficiency that therefore suspected. After the patient regained muscular control, she was discharged later that day with no complications.

Discussion

While no treatment exists, documentation of acetylcholinesterase deficiency is essential so for future surgeries, patients can remain intubated and mechanically ventilated until they regain movement to be extubated safely. In addition, dibucaine testing to see the level of acetylcholinesterase enzyme deficiency may not be available at all hospitals, ruling out myasthenia gravis by antibody levels and excluding conditions that may cause moderate paralysis should be adequate. For patients with suspected or confirmed acetylcholinesterase deficiency, if receiving muscle paralytic for indicated surgery, the patient should receive an anesthetic to provide adequate sedation to deter the event of awareness under anesthesia that happened in this particular case.

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OHIO PODIUM PRESENTATION - CLINICAL VIGNETTE Nihaal Reddy

Checkpoint Inhibitor Induced Type 1 Diabetes in a Type 2 Diabetic Sarcoma Patient

Title

Checkpoint Inhibitor Induced Type 1 Diabetes in a Type 2 Diabetic Sarcoma Patient

Authors

Nihaal Reddy, BS Kathleen Dungan, MD

Introduction

Immune checkpoint inhibitors such as pembrolizumab (a programmed cell death 1 [PD-1] monoclonal antibody) have become a common treatment options for cancer patients. We present a case of a patient with type 2 diabetes (T2D) developing type 1 diabetes (T1D) after pembrolizumab for sarcoma.

Case Presentation

An 80-year old man with T2D diagnosed at age 67 initially presented to orthopedic oncology in March of 2019 for a mass on his left hip which was revealed to be a high-grade undifferentiated pleomorphic/spindle cell sarcoma. Hemipelvectomy was initially recommended but declined by the patient. At this time, T2D was being managed with metformin and glimepiride. His initial body mass index was 22, serum glucose was 108, and his last HbA1c was 7.8% on 8/3/2018. The patient completed 3 cycles of doxorubicin and dacarbazine, followed by 1 cycle of gemcitabine and docetaxel (both regimens accompanied by oral dexamethasone) as well as local radiation. He switched to pembrolizumab on October 4, 2019. On March 3, 2020, the patient's random glucose was measured at 524 (and osmolarity 307 but with normal anion gap); the patient also reported progressive hyperglycemia with self-monitoring. The patient started insulin via his primary care provider and was referred to endocrinology for progressive hyperglycemia. His HbA1c was 7.1 on 4/28/20 but was felt to be unreliable due to marked anemia (hemoglobin as low as 6.2 g/dL on 3/31/18 with an elevated red blood cell distribution of 17.9%). Antibody testing performed at this time revealed an elevated GAD65 antibody of 1.33 nmol/L and a decreased C-peptide of 0.1 ng/mL, consistent with a diagnosis of T1D. The patient was maintained on basal bolus insulin therapy and transitioned to hospice approximately 2 months later.

Discussion

This case illustrates the complexity of recognizing checkpoint inhibitor induced T1D in the setting of previously diagnosed T2D. The incidence of T1D in patients receiving immunotherapy was reported to be 1.27% between 2015 and 2019, and therefore is less common than other checkpoint inhibitor induced autoimmune disorders. Most patients were being treated for melanoma or lung carcinoma, so this is the first reported case of a patient with sarcoma related induced T1D. Studies have also found checkpoint inhibitor induced T1DM to predominate amongst those with HLA-DR4, which was found in 74% of individuals analyzed over a 6-year period. HLA testing is not routinely recommended but It is important to be vigilant for T1D even in patients without other risk factors.

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OHIO PODIUM PRESENTATION - CLINICAL VIGNETTE Nihaal Reddy

Novel Coronavirus (COVID-19) induced Guillain-Barre Syndrome (GBS) and Recovery via Standard Treatment

Title

Novel Coronavirus (COVID-19) induced Guillain-Barre Syndrome (GBS) and Recovery via Standard Treatment

Authors

Nihaal Reddy, BS Bill Jacobsen, MD Suraj Muley, MD

Introduction

The novel coronavirus (COVID-19) initially began in China and has since spread around the world, continuing to cause new infections daily. While COVID-19 has been shown to primarily cause respiratory illness, here we describe a classical presentation of GBS in the setting of a COVID-19 infected patient and subsequent recovery with standard therapies.

Case Presentation

A 65 year old female patient without significant past medical history that first complained of malaise 10 days prior to her presentation to the hospital. She tested positive for COVID-19 via PCR test and chest x-ray revealed coarse interstitial infiltrate concerning for interstitial edema or pneumonitis. Upon admission, neurologic examination showed full strength in her arms with 5/5 shoulder abduction, elbow flexion, and wrist flexion but 3/5 strength in proximal legs with hip flexion, and 2/5 knee extension and ankle dorsiflexion bilaterally. She described mild sensory changes to touch and pressure in her distal legs with decreased sensation and paresthesias in a stocking glove distribution. She was areflexic in the legs and hyporeflexic in the arms. She presented with 1/5 bilateral biceps tendon reflex and 0/5 bilateral patellar and ankle reflexes. The patient had MRI studies with contrast of the complete neuraxis that were negative and did not show root enhancement. Lumbar puncture revealed albuminocytologic dissociation with CSF revealing a white blood cell (WBC) count of 2, glucose of 69, and protein of 86, and in conjunction with her history and neurologic examination she was diagnosed with GBS. EMG was not performed as it was not part of standard protocol at this hospital. She was started on IVIg 0.4g/kg/day for 5 days. Shortly after treatment, the patient had to be intubated due to respiratory failure due to COVID-19 complications. Repeat neurologic examination at 11 days after admission revealed worsening motor examination with shoulder abduction 3/5,

elbow extension and wrist extension both 5/5, hip flexion 1/5, knee extension 3/5 bilaterally, and ankle dorsiflexion 3/5 bilaterally. The decision was made by the neurology team to treat with plasmapheresis for 6 days. Follow-up examination 8 days later revealed improving motor examination with deltoid score of 4/5, biceps score 5/5, hip flexion of 3/5, right knee extension of 5/5, left knee extension of 4/5, and dorsiflexion 4/5 bilaterally. On this day, the patient also reported improved respiratory function and PCR tests had shown her to have cleared COVID-19. Additional neurologic examination 3 days later revealed continued motor improvement and improved responses to sensations of touch and pressure, and the patient was discharged to an acute rehabilitation facility.

Discussion

Case reports of GBS in the setting of COVID-19 are limited, and it is unknown what type of pathophysiology this will usually entail. Neurological complications are becoming more evident as common findings in COVID-19 infections, but as our case showed these patients can have a remarkable recovery with standard therapies. However, more time and experience will shed light on the spectrum of autoimmune disease related to COVID-19.

WASHINGTON PODIUM PRESENTATION - CLINICAL VIGNETTE
Nobel Nguyen

Statin-induced immune-mediated necrotizing myopathy; a multidisciplinary approach to an uncommon presentation in a positive HMG-CR antibody Patient

Title

Statin-induced immune-mediated necrotizing myopathy; a multidisciplinary approach to an uncommon presentation in a positive HMG-CR antibody Patient

Authors

Nobel Nguyen, MSIII, Shae Patel, MSIII, Nicholas Caputo, DO

Introduction

Statins are the primary class of medication used to lower cholesterol for the prevention of cardiovascular disease. The most commonly reported side effect is muscle toxicity with severe myonecrosis, which can lead to clinical rhabdomyolysis. A rarer and more malignant adverse effect than rhabdomyolysis is statin-induced immune-mediated necrotizing myopathy (IMNM), which is a genetic autoimmune condition believed to trigger myogenic symptoms.1 Clinically, IMNM is suspected when statin-associated muscle symptoms fail to resolve several weeks after statin discontinuation, in which case a muscle biopsy is warranted. HMGCR is the rate-limiting enzyme of cholesterol synthesis, and it is believed that the muscle damage in statin-induced IMNM is mediated by autoantibodies against HMG-CR An antibody directed against hydroxymethylglutaryl (HMG)-CoA reductase (HMGCR) has been identified and is implicated as a culprit among cases of IMNM.

Case Presentation

A 75-year old woman with a history of mixed dyslipidemia is readmitted to the hospital floor after having persistent weakness in the setting of persistently elevated CK levels. The patient felt fatigued 8 months prior but symptoms significantly declined two months ago to the point where she had extreme difficulty getting up from her seat. She was admitted 4 weeks ago for generalized weakness and had a peaked CK level of 17,622. Her rosuvastatin was discontinued due to concerns for statin-induced rhabdomyolysis. After discontinuing her statin, her CK levels decreased to 7400, yet she still had persistent rhabdomyolysis. Neurology was consulted for a possible demyelinating process, but images were negative. Endocrinology was then consulted and was suspicious of IMNM. While the patient did decline a muscle biopsy, an HMG-CR antibody test was collected and results were pending. The patient was immediately started on

triple therapy (daily IVIG, high-dose oral steroids, methotrexate with folate acid supplementation) due to progressively worsening symptoms and possible nephrotoxicity. Within days of treatment, symptoms resolved and CPK decreased significantly. Post-treatment initiation, the HMG-CR antibody was positive, which confirmed the diagnosis of IMIM. The patient was then discharged and asked to follow-up with primary care, nephrology, and rheumatology.

Discussion

IMNM is a statin-induced myopathy that presents with progressive muscle weakness and elevated CPK levels. In addition to immediate statin discontinuation, management of IMNM includes triple therapy, which has major adverse effects. The provider must make the decision to initiate treatment based on high clinical suspicion, even before confirmatory testing is resulted, especially when clinical deterioration occurs, as the triple therapy does carry potential adverse effects. Therefore, high clinical suspicion, step diagnostic approach, and decision to treat based on the severity of symptoms or evidence of acute clinical decline A multidisciplinary approach was essential in excluding other potential diagnoses as a concrete plan of care was formulated. Neurology and endocrinology consultation led to the final diagnosis and treatment plan. Patient follow-up with nephrology for renal function and rheumatology for CPK management and relapse is crucial for maintaining and treating this immune-mediated disease process. In conclusion, early recognition of IMNM and prompt management with expert guidance and a multidisciplinary approach are of great importance for better outcomes.

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INDIA - POSTER FINALIST - CLINICAL VIGNETTE Vivek Bhat

Disseminated Nocardiosis Associated with Immune Thrombocytopenia

Title

Disseminated Nocardiosis Associated with Immune Thrombocytopenia

Authors

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Introduction

Nocardia is an uncommon opportunistic pathogen acquired by direct contact or inhalation of soil or dust particles. In the immunocompetent, it causes local skin and soft tissue infections, while in the immunocompromised, disseminated infections, notably involving the lungs and brain, may occur. The mortality in disseminated infections is quite high. Hematologic patients, classically those with leukemias, are frequently immunocompromised. ITP is a rare condition, patients with which form an important, but the often under-recognized group at elevated risk of infection, primarily due to the therapy involved. We report a case of disseminated Nocardiosis in a patient of Immune Thrombocytopenia (ITP). To our knowledge, there have only been four cases of disseminated Nocardiosis associated with ITP described in English literature. [1-3]

Case Presentation

A 33-year-old male, who was a known case of ITP, on immunosuppressants, presented with fever, a diffuse pustular rash, and a right great toe abscess. He was started on empirical broad-spectrum antibiotics, with subsequent CT Thorax revealing cavitation with a tree-in-bud pattern of nodules. In the course of his stay, he developed seizures, with brain MRI revealing multiple ring-enhancing lesions, leading us to suspect disseminated tuberculosis. Finally, microbiological reports revealed Gram positive, but Acid Fast bacilli, confirming Nocardia species, for which he was given a regimen of Amikacin, Cotrimoxazole, and Imipenem, with the continuation of anti-convulsants. Unfortunately, the patient succumbed to his infection.

Discussion

ITP is a rare condition caused by the autoimmune destruction of platelets. The first-line treatment for ITP is corticosteroids, with second choice therapy including monoclonal antibodies like Rituximab. Corticosteroid therapy has been implicated as a leading factor for severe infections in primary ITP. They impair innate and cellular immunity, the latter being particularly pertinent in our case, as Nocardia is an obligate intracellular organism. Our patient's initial presentation led us to suspect disseminated furunculosis. The CT findings of tree in bud nodules and the MRI findings of multiple ring-enhancing lesions led us to suspect tuberculosis and invasive fungal infections, as well as a possibility of disseminated Nocardiosis. Finally, the microbiological report confirmed Nocardial infection. Disseminated Nocardiosis is defined by the involvement of at least two noncontiguous organs and/ or the brain, as seen in our patient. [2] It is rare, and often underdiagnosed due to its non-specific features and rarity. In India particularly, it is often mistaken for disseminated tuberculosis. [4] Establishing the diagnosis requires a histologic diagnosis, as in our case, or a positive culture. The selection of drugs must be guided by culture sensitivity patterns of the organism, but the drug of choice is Trimethoprim-Sulfamethoxazole, alone or in combination with other antimicrobials. [2] In conclusion, in immunocompromised hosts, a high index of suspicion for Nocardia is required. Rapid identification of species is necessary, as many are resistant to standard antibiotics. This, in combination with the propensity for spread, often leads to fatal outcomes, which are often inevitable in CNS involvement, such as in our case.

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BANGLADESH - POSTER FINALIST - CLINICAL VIGNETTE Abu Talha Fokhrul

Anti Ulcerant Drugs in Bangladesh: Used or Abused

Title

Anti Ulcerant Drugs in Bangladesh: Used or Abused

Authors

Main Author: Abu Talha Bin Fokhrul Institution: Sylhet MAG Osmani Medical College Co-author: Sirajum Munira Institution: Sylhet MAG Osmani Medical College

Introduction

In spite of limited prescribing recommendation, up hilling use of anti ulcerant drugs in Bangladesh is far beyond a change in morbidity. These are frequently used without prescription, a clear indication and for a longer period than recommended. In this paper, we will discuss about the anti ulcerant drugs whether it is being used or abused in Bangladesh.

Case Presentation

It was an observational study from January 2017 to March 2018 and we took convenient type of non-randomized samples of a group of 1150 young, middle and old aged people. Data collection was questionnaire and data collection procedure was face to face. The results reported that among 1150 people, 708 were female and 442 were male. The age groups were 15-30, 31-45, 46-60, 61-75 and 76-90. Unfortunately, 100% people were found taking anti ulcerant drugs frequently while 53.85 % people were in the young age group (15-30). 73.07% people were taking anti ulcerant drugs without any prescription of a legal doctor whereas 92% of them are taking it by the suggestion of local compounders. Burning pain in the chest and abdomen, abdominal fullness, regurgitation, acidity and in some cases painkillers were the common reasons for anti ulcerant drug consumption.

Discussion

Besides sides effect profile, it causes enormous burden of health expenditure throughout Bangladesh. Limited prescribing of anti ulcerant drugs by authorized doctors for specific indications, reduction of extreme availability and providing these drugs only with prescription can lead to a healthy and balanced life.

ALABAMA POSTER FINALIST - CLINICAL VIGNETTE Annkay Alexander

Viral Hepatitis A Infection: A Rare Cause Of Acute Acalculous Cholecystitis

Title

Viral Hepatitis A Infection: A Rare Cause Of Acute Acalculous Cholecystitis

Authors

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Introduction

In the setting of acute Hepatitis A infection, viral involvement of the biliary epithelium may result in acute acalculous cholecystitis.

Case Presentation

A 40 year old male presented to the emergency department with two days duration of diffuse abdominal pain, nausea, vomiting, and poor oral intake following two weeks of diarrhea. The patient described the pain as burning, worse with meals, and rated it as a 10/10 at its worst. Patient denied fever, chills, hematochezia, melena, chest pain, or shortness of breath. He denied recent travel or sick contacts. He had no significant past medical history and is not taking any prescribed or over the counter medications. Physical exam was significant for right upper quadrant tenderness. There was no guarding, rigidity, organomegaly, or masses. Laboratory results were significant for total bilirubin 2.8 mg/dL, direct bilirubin 2.5 mg/dL, alkaline phosphatase 358 EU/L, ALT 1771 EU/L, AST 1535 EU/L. SARS CoV 2 PCR was negative. Abdominal ultrasound found no significant abnormality of the liver, but a significantly contracted gallbladder, with apparent wall thickening measuring 3.4 mm. Follow up CT scan of the abdomen confirmed associated mucosal hyperemia and diffuse pericholecystic edema, no gallstones were visualized. Hepatitis panel was reactive for hepatitis A IgM. It was suspected this clinical presentation was consistent with acute hepatitis A infection. The patient was managed symptomatically and monitored, with no significant improvement. On the fourth day of hospitalization, total bilirubin increased to 4.8 mg/dL. HIDA scan confirmed biliary obstruction with cholecystitis. Laparoscopic cholecystectomy was performed without complication, finding an acutely edematous, distended, discolored, acalculous gallbladder. Abdominal pain, nausea, and vomiting completely resolved one day following cholecystectomy

and diarrhea improved. Patient was discharged home with self-care, counseled on hygiene and self-limiting nature of hepatitis A.

Discussion

This patient had acalculous cholecystitis superimposed on acute hepatitis A. Hepatitis A generally remains asymptomatic or presents acutely with a combination of self limiting abdominal pain, nausea, vomiting, diarrhea, or jaundice. Additionally, Hepatitis A Virus has rarely been associated with the invasion of the biliary ducts and gallbladder epithelium. The subsequent cell mediated immune response can lead to acute acalculous cholecystitis. Increase in portal pressure due to hepatic infection may also contribute. Although hepatitis A offers an explanation for the presentation of right upper quadrant abdominal pain, nausea, vomiting, and diarrhea; persistent, severe abdominal pain in the setting of increased bilirubin indicates further evaluation for biliary obstruction. Evaluation for biliary obstruction and cholecystitis should not be delayed as treatment with laparoscopic cholecystectomy may lead to drastic symptomatic improvement and prevent life threatening complications of gangrene, perforation, and empyema. Our patient was educated to the self-limiting nature of hepatitis A, potential for enteric spread, and appropriate hygienic practices. Vaccination status of the household was confirmed. It is important to consider acalculous cholecystitis as a potential etiology of right upper quadrant pain in the setting of hepatitis A associated with hyperbilirubinemia, with surgical excision as the curative treatment.

ALABAMA POSTER FINALIST - CLINICAL VIGNETTE Tyeler Rayburn

DIAGNOSING BLEOMYCIN-INDUCED LUNG INJURY IN A PATIENT WITH HIV AND HODGKIN LYMPHOMA

Title

DIAGNOSING BLEOMYCIN-INDUCED LUNG INJURY IN A PATIENT WITH HIV AND HODGKIN LYMPHOMA

Authors

Tyeler Rayburn, College of Medicine, University of South Alabama. Nida Ahmed, M.D., Division of Pulmonary and Critical Care, University of South Alabama

Introduction

Bleomycin is an antitumor agent used to treat Hodgkin lymphoma and germ cell tumors. The use of bleomycin is limited by potential for oxidative lung damage. Bleomycin-induced lung injury is an uncommon but well-known cause of fatal pulmonary toxicity.

Case Presentation

A 37-year-old African American lady was evaluated at an academic center in Mobile for two weeks of dyspnea and dry cough. There was no hemoptysis. The patient's medical history was notable for HIV (CD4

Discussion

The diagnosis of bleomycin pulmonary toxicity is one of exclusion; often made within weeks of chemotherapy administration and rarely after six months. Incidence correlates with cumulative dose, with most cases occurring with >400 IU. Here we present a case of bleomycin-induced lung injury with an unusually low cumulative dose of

ARKANSAS POSTER FINALIST - CLINICAL VIGNETTE Muhammad Abu-Rmaileh

GCA-Induced Pellagra: A Case Study on a Patient who presented with Altered Mental Status and Diarrhea

Title

GCA-Induced Pellagra: A Case Study on a Patient who presented with Altered Mental Status and Diarrhea

Authors

Suzanne Abou-Diab B.S., Muhammad Abu-Rmaileh B.S., Amad Wahlajahi B.A. M.S. Gayathri Krishnan M.D.

Introduction

Giant Cell Arteritis (GCA) is a large and medium cell vasculitis with systemic effects. Classic symptoms include fever, night sweats, headaches, jaw claudication, and visual loss. The lifetime risk is 1% in women and 0.5% in men, with 80% being over 70. Our case is a patient who presented with pellagra-like symptoms due to cognitive and functional decline associated with GCA.

Case Presentation

Our patient is a 74 year old, Caucasian gentleman admitted for further workup of leukocytosis, altered mental status (AMS), and diarrhea. Over 3 months, the family reported progressive cognitive decline with decreased orientation and increased irritability. Additionally, he developed a green, jelly-like diarrhea 3 weeks prior to admission. In the hospital, he did not have fevers, rash, muscle pain/weakness, or joint swelling. His labs were remarkable for elevated leukocytes, ESR, and ferritin as well as low folate, B6, albumin, and zinc. Our differential diagnosis included infectious diarrheal diseases, sepsis, heart failure, vascular dementia, and temporal arteritis. Temporal artery biopsy, tumor markers, pancreatic elastase, stool culture, systemic infectious work up, and imaging of head and abdomen were ordered. His temporal artery biopsy returned positive for GCA and we initiated high dose steroids. After IV high-dose multivitamin with minerals, his diarrhea and cognition improved. His symptoms were attributed to a pellagra-like reaction caused by vitamin deficiency due to malnutrition. We presumed he did not have the classic photosensitive dermatitis with pellagra due to being confined indoors for several months.

Discussion

This presentation of GCA is unique due to AMS and diarrhea. While there have been some documented cases of GCA-related vascular dementia, it would not explain our patient's improvement with prednisone and nutrient replenishment. Identifying atypical manifestations of GCA aids in rapid diagnosis and decrease in fatalities.

CALIFORNIA POSTER FINALIST - CLINICAL VIGNETTE Alden Dahan

Testicular Cancer Presenting as Obstructive Cholangitis

Title

Testicular Cancer Presenting as Obstructive Cholangitis

Authors

Alden Dahan, BS (1), Melody Chang, MD (2), Sigrid Burruss, MD (2) 1) Univesity of California, Riverside School of Medicine 2) Division of Acute Care Surgery, Loma Linda University Medical Center

Introduction

Testicular cancer is the most common cancer in men between the ages of 15 and 35 years old 1 and often presents as a painless scrotal mass 2. Early detection is associated with high survival rates but metastatic disease or retroperitoneal lymphadenopathy results in worse prognosis and requires chemotherapy with radiation.

Case Presentation

A 27-year-old male with a BMI of 44.04 kg/m presents with a 3-week history of worsening severe abdominal pain and cholestatic jaundice. CT imaging revealed a 14x14x11cm retroperitoneal mass with resulting compression of the right ureter and common bile duct with gallbladder dilation and intrahepatic duct dilation. Scrotal ultrasound showed a 12cm right testicular mass with elevated LDH 522 U/L, AFP 11802 ng/ml and HCG 1301 miU/ml. The patient arrived to the SICU in septic shock from cholangitis secondary to the common bile duct obstruction. ERCP was unable to be completed due to significant narrowing of the duodenum from extrinsic compression. A transhepatic cholecystostomy tube was placed allowing for decompression of the biliary tree but with ongoing liver dysfunction. Patient had new onset renal failure requiring ongoing hemodialysis and required intubation with subsequent tracheostomy. Scrotal biopsy shows likely primary germ cell malignancy however further characterization is not possible due to near complete necrosis of the tumor. The patient remains in multisystem organ failure and is unable to receive chemotherapy or radiation.

Discussion

This is the first report to our knowledge of testicular cancer resulting in cholangitis from external compression of the biliary tree from the retroperitoneal metastatic disease. Testicular cancer commonly spreads to the lung and lymph nodes of the chest, pelvis and neck with more advanced cases spreading to the liver and bones. Even with spread to the retroperitoneal lymph nodes survival is still 96% and down to 73% if spread to lungs or other organs 3. Our patient has disease contained to the retroperitoneum but the extrinsic compression for extended period of time led to multisystem organ failure and ongoing ICU support. Early identification of obstruction by metastatic disease and support of organ dysfunction or failure is necessary for improved outcomes.

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CALIFORNIA POSTER FINALIST - CLINICAL VIGNETTE Sammie E Fung

Under Pressure

Title

Under Pressure

Authors

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Introduction

Posaconazole is a medication commonly used for treatment of invasive fungal infections. An uncommon but significant adverse effect is posaconazole-induced pseudohyperaldosteronism (PIPH), characterized by secondary hypertension, hypokalemia, and metabolic alkalosis.

Case Presentation

A 30-year-old man with newly diagnosed human immunodeficiency virus (HIV; CD4 cell count of 102 cells/µL and viral load of 185,000 copies/mL) presented to our hospital with cough, fevers, chills, night sweats, dyspnea, decreased appetite, and recent unintentional weight loss. His chest x-ray showed diffuse interstitial infiltrates. Laboratory results were significant for elevated serum *Coccidioides* IgG antibodies, a serum Cocci complement fixation of 1:512, and unremarkable lumbar puncture studies and bone scan. The patient was diagnosed with severe pulmonary coccidioidomycosis, and after induction with amphotericin B, was discharged on fluconazole therapy.

The patient subsequently developed cheilitis, xeroderma, neutropenia, and severe hyponatremia with sodium nadir of 105 mmol/L; thus, fluconazole was switched to posaconazole. A posaconazole trough was found to be 7 µg/mL (therapeutic goal 2 µg/mL), thus the dose was decreased.

Over the next 3 years of therapy, the patient had significant clinical improvement with Cocci titers decreasing to 1:16. However, he was noted to have new-onset hypertension (ranging 140-180 mmHg/90-105 mmHg) refractory to maximum dosages of amlodipine, lisinopril, and hydrochlorothiazide. Laboratory studies revealed low potassium (2.9 mmol/L), renin (0.1 ng/mL/hr), and aldosterone (<3 ng/dL). The patient was diagnosed with PIPH; posaconazole was changed to isavuconazole, and spironolactone was started for pseudohyperaldosteronism. On twelve-month follow up, the patient no longer needed any antihypertensives and had a blood pressure of 120/80.

Discussion

This case describes a case of pseudohyperaldosteronism resulting from posaconazole therapy for a pulmonary coccidiomycosis infection. Coccidioidomycosis, also known as Valley Fever, is an opportunistic infection caused by inhalation of *Coccidioides* fungi spores, endemic to the Southwestern region of the United States [1]. Pulmonary manifestations are most common, though the infection can also spread to the bones, joints, skin, and central nervous system. Dissemination occurs in approximately 1% of patients and is most commonly seen in immunocompromised patients with diabetes, malignant neoplasms, or HIV [2,3].

Posaconazole is a triazole antifungal that works against invasive fungal infections, including *Coccidioides*, by inhibiting the synthesis of ergosterol, an essential component of fungal walls. Although widely available and well-tolerated, elevated levels of serum posaconazole are reported to cause pseudohyperaldosteronism, resulting in secondary hypertension, hypokalemia, and metabolic alkalosis [4,5]. One study found that all patients with serum posaconazole levels above 4.0 µg/mL developed this side effect. In a similar mechanism to that of how licorice root extract can cause pseudohyperaldosteronism, PIPH inhibits CYP11B and 11β-HSD2, resulting in the accumulation of 11-deoxycortisol and 11-deoxycorticosterone which directly activate mineralocorticoid receptors [5,6]. Treatment is focused on cessation of posaconazole and antagonism of the mineralocorticoid receptor with spironolactone.

This case highlights a rare but potentially severe adverse effect of posaconazole that should be considered in patients who develop signs of hyperaldosteronism. As the risk of PIPH increases with drug levels, close monitoring of serum drug levels should be considered during therapy.

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CALIFORNIA POSTER FINALIST - CLINICAL VIGNETTE Neeharika Namineni

Pericarditis following endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) in a patient with a systemic fungal infection

Title

Pericarditis following endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) in a patient with a systemic fungal infection

Authors

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Introduction

When a patient with systemic fungal disease developed purulent pericarditis, it was presumed to be coccidioidomycosis pericarditis until culture data implicated EBUS-TBNA.

Case Presentation

A 37-year old Hispanic male veteran with type 2 diabetes and recent diagnosis of disseminated coccidioidomycosis presented to the ED with worsening shortness of breath, cough, and 15-lb weight loss despite adherence to fluconazole. PET/CT showed further dissemination of the disease from a month prior, specifically a necrotizing subcarinal mass. An echocardiogram was normal. The patient was started on a 2-week course of liposomal amphotericin.

Further workup was pursued to rule out concomitant malignancy. On hospital day (HD) 6, the patient underwent an EBUS-TBNA with bronchoalveolar lavage (BAL) of the subcarinal node with no apparent complications. Pathology from the aspiration showed granulomatous inflammation with a single budding coccidioidomycosis. Flow cytometry showed no evidence of malignancy. BAL fluid grew coccidioidomycosis with high MIC to fluconazole.

Over the next week, the patient reported submandibular fullness and odynophagia. A non-contrast CT scan of the neck on HD 9 was unremarkable. On HD 14, the patient experienced

acute position-dependent dyspnea. EKG showed new PR depressions in lead II and echocardiogram revealed a moderate-sized, posterolateral pericardial effusion.

With no signs of tamponade physiology, the pericarditis was medically managed with an extended course of amphotericin, isavuconazole, and serial echocardiograms. On HD 17, the enlarging effusion required urgent pericardiocentesis of 720cc fluid and pericardial drain placement. On HD 19, the pericardial fluid culture grew *Streptococcus anginosus-constellatu*; antibiotics were initiated and narrowed to ceftriaxone.

Over the next 2 weeks, the patient's course was complicated by persistent, loculated pericardial effusions despite tPA washes and pericardial window placement. On HD 36, the patient experienced tamponade causing PEA cardiac arrest. An emergent sternotomy with washout was performed, but followed by ventricular fibrillation arrest on the operating room table. ROSC was achieved after open cardiac massage and defibrillation attempts.

The patient was successfully extubated the next day and started on amphotericin, ceftriaxone, and prednisone. Pericardial tissue and further pericardial fluid cultures grew no organisms. The patient was discharged on HD 55 with augmentin, colchicine, and posaconazole for planned 2-year treatment of the disseminated coccidioidomycosis.

Discussion

Initially, we presumed pericarditis was caused by the existing fungal disease. However, pericardial fluid cultures grew *Streptococcus anginosus*, with no fungus isolated. *Streptococcus anginosus* is a normal oropharyngeal bacteria and an unusual cause of purulent pericarditis, typically requiring hematogenous seeding or local invasion. Yet, our patient had negative blood cultures and no other identified foci of bacterial infection.

One explanation for the introduction of a normal oropharyngeal bacteria to the pericardium was the EBUS-TBNA. While EBUS-TBNA is widely considered to be a safe procedure, pericarditis has been noted as a rare complication. While bacterial pericarditis is rare in the modern era of antibiotics, late recognition is associated with high mortality. Our patient experienced high morbidity and life-threatening complications from this infection. Therefore it is critical to diagnose early and consider iatrogenic sources of infection when presented with new or worsening symptoms after an EBUS-TBNA.

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CALIFORNIA POSTER FINALIST - CLINICAL VIGNETTE Vu Pham

MELAS with acute renal manifestation

Title

MELAS with acute renal manifestation

Authors

Vu Pham, Daniel Gehlbach MPH, Jolene Nguyen-Cuu, Catherine Ha, Allen Le, Charles Le MD

Introduction

Mitochondrial encephalopathy, lactic acidosis, and stroke-like episodes (MELAS) syndrome is a rare, progressive, and lethal disease with a life expectancy of 16.9 years after the onset of symptoms.1 Although this syndrome may arise from sporadic mutations, MELAS is a mitochondrial disorder and thus is inherited from maternal DNA. MELAS frequently presents as Mitochondrial Multi Organ Disorder Syndrome (MIMODS) at some point in the course of the disease.3 The most affected organs are the muscle (97%), central nervous system (72%), endocrine glands (69%), heart (58%), intestines (55%), and peripheral nerves (50%).3 Although MELAS uncommonly affects the kidneys, it more often manifests as chronic kidney disease and rarely causes acute kidney injury that immediately leads to permanent renal failure. In this case, we discuss a patient who presents with a unique manifestation of MELAS.

Case Presentation

A 28 year-old Vietnamese male with no past medical history presents to the hospital after suffering an episode of a tonic-clonic seizure with left-sided hemiparesis. He has no significant family medical history and is the youngest of 6 children, all of whom are healthy. Non-contrast CT study of the brain was performed and showed hyperdense areas in the right basal ganglia that raised suspicion for ischemia. His laboratory studies show serum creatinine of 3.7 mg/dL, potassium of 5.9 mmol/L, creatine kinase of 87,000 U/L, BUN of 65 mg/dL, and a lactate level of 10.6 mg/dL. His blood alcohol level was within the normal range and urine drug screen was negative.

Twelve hours later, his condition continued to deteriorate. Repeat labs show lactate levels of 13.2 mg/dL, creatinine levels of 4.2 mg/dL and GFR levels of 13 ml/min/1.73 m2 which required emergent dialysis. A renal ultrasound showed mild echogenic kidneys consistent with renal disease without any stone, mass, cysts, or hydronephrosis. A CT and MRI of the kidneys were performed, but the results were inconclusive. Kidney biopsy histology revealed moderate sclerotic changes consistent with focal segmental glomerulosclerosis (FSGS). He continued to be

stabilized on dialysis in the ICU and after two weeks, MELAS was suspected and a muscle biopsy and mitochondria genetic testing were ordered. The muscle biopsy showed red ragged fibers and mitochondria genetic testing demonstrated the pathogenic variant m.3243A>G in the MT-TL1 gene, confirming MELAS. Although treated accordingly to his new diagnosis, the patient continues to have renal failure and is currently placed on the kidney transplant list.

Discussion

With such a large spectrum in the manifestation of this disease, diagnosing MELAS can be difficult. Because of its difficult nature, it is important for clinical providers to be aware of the features of MELAS and the potential for this disease to cause acute renal failure. Being able to recognize and to diagnose MELAS at the initial stage of the disease may reduce unnecessary testing and allow for appropriate management. Management primarily includes symptomatic control and boosting mitochondrial function to prolong the course of the disease.1 With the knowledge of how MELAS is inherited, genetic counseling is an additional option for family members to detect the disease in the early stages.4

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CALIFORNIA POSTER FINALIST - CLINICAL VIGNETTE John Pietrykowski

Non-typical Nontuberculous: M. kansasii Fournier Gangrene

Title

Non-typical Nontuberculous: M. kansasii Fournier gangrene

Authors

John Pietrykowski, BA, Mushrin Malik, MBBS, Vineet Gupta, MD, FACP, SFHM, Ian Jenkins, MD, SFHM

Introduction

Mycobacterium kansasii is a nontuberculous mycobacterium, which most commonly causes chronic, upper lobe cavitary lung disease that is similar to that seen with Mycobacterium tuberculosis. Disseminated disease usually occurs in the setting of immunocompromise and can present with a wide range of symptoms including, but not limited to, fever, hepatosplenomegaly, pulmonary nodules/infiltrates, lymphadenopathy, and vertebral osteomyelitis. However, M. kansasii has never been reported to cause Fournier gangrene (necrotizing fasciitis of the perineum), which is typically a polymicrobial infection caused by gram negative rods and anaerobes.

Case Presentation

A 55-year-old man with a history of inflammatory arthritis and kidney transplant on tacrolimus and high dose prednisone presented to the Emergency Department with pain, swelling and erythema of the perineum and scrotum. A small red papule had progressively worsened over the past year, until severe pain finally prompted him to seek medical attention. His presentation was delayed despite guidance from his physician, however, due to concern surrounding the coronavirus pandemic. On presentation, the patient was afebrile, tachycardic, and hypertensive. Physical exam was notable for perineal erythema and fluctuance extending to the scrotum with diffuse tenderness to palpation. There was also lumbar paraspinal tenderness and solitary cutaneous nodules were noted on the patient's scalp and thigh. ED course included a scrotal ultrasound suggestive of underlying infection and incision and drainage of the perineal abscess, which produced copious purulent fluid. The patient received broad-spectrum antibiotics and underwent surgical exploration of the perineum and scrotum, with evidence of extensive necrotizing infection. Operative cultures grew M. kansasii. Review of past microbiology data indicated that a sputum culture one year earlier had also been positive

for M. kansasii. Chest X-ray showed a single 1.9 cm pulmonary nodule and MRI of the lumbar spine showed L3-L5 discitis and osteomyelitis. Cultures from sputum, vertebrae, skin, and blood each grew M. kansasii. Treatment with rifampin, ethambutol and azithromycin was started and the patient gradually improved after more than twenty surgical debridements.

Discussion

To our knowledge, this is the first report of Fournier gangrene due to M. kansasii. Disseminated M. kansasii infection is rare and can have a variable presentation, but it is most often seen in immunocompromised patients like ours. Infection typically begins in the lungs but reports of extrapulmonary disease in the literature include lymph nodes, skin, and the musculoskeletal system. The case described here involves a patient who was colonized with pulmonary M. kansasii and, as a result of immune-suppressing medications, became susceptible to dissemination to typical sites, like the skin and spine, as well as a non-typical site, the perineum. The usual treatment regimen for M. kansasii infection includes azithromycin, rifampin, and ethambutol until cultures have been negative for 12 months. Teaching Points: 1. A high index of suspicion is needed to identify uncommon infections like disseminated M. kansasii in immunocompromised patients, as non-specific presentations may delay diagnosis. 2. The COVID-19 pandemic has resulted in non-pandemic related harms. The perceived exposure risk associated with healthcare settings has created a substantial barrier to care and led to neglected health conditions.

COLORADO POSTER FINALIST - CLINICAL VIGNETTE Caitlan Hinton

An Unexpected Case of Evans Syndrome in a Patient Returning from an African Safari

Title

An Unexpected Case of Evans Syndrome in a Patient Returning from an African Safari

Authors

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Introduction

Evans Syndrome (ES) is a rare autoimmune condition characterized by the sequential or simultaneous development of autoimmune hemolytic anemia (AIHA), immune thrombocytopenic purpura (ITP), and/or immune neutropenia. This chronic condition can be idiopathic/primary or secondary to an underlying process. The disease mechanism is thought to be due to excessive immune dysregulation. The natural history of ES is heterogenous and marked by recurrent exacerbations and remissions. First-line treatment is corticosteroids ± IVIG, but many patients require second or third-line therapies. The rarity of this condition makes it a diagnostic challenge, but it is a diagnosis that should be considered in any patient presenting with AIHA or ITP.

Case Presentation

A previously healthy 33-year-old female presented with fever, vomiting, diarrhea, abdominal pain, jaundice, confusion, and weakness that developed during an African safari. She had been taking atovaquone/proguanil for malaria prophylaxis, but symptoms continued to progress despite medication cessation 11 days prior to presentation. Physical exam was notable for jaundice, pallor, axillary and inguinal lymphadenopathy, bilateral lower extremity petechiae and pitting edema, right upper quadrant tenderness, and confusion. Labs were notable for a hemoglobin of 3.2 g/dL, hematocrit of 9.1%, reticulocyte count of 40.5%, and platelet count of 46*10^3/uL. LFTs were abnormal with an ALT of 142 U/L, AST of 78 U/L, and bilirubin of 3.2 mg/dL. Hemolysis labs revealed a haptoglobin of

Discussion

This patient's recent trip to Africa and use of a hepatotoxic medication created a broad differential related to this history that obscured initial consideration of ES as the underlying diagnosis. The diagnosis of ES in this patient was unexpected and unrelated to her recent history, making it an important representation of the diagnostic challenge that ES can present. This patient also presented with AST and ALT elevations which appear to be unique amongst ES case reports and may be secondary to use of the hepatotoxic medication or to her ES and represent hepatitis from extramedullary hematopoiesis or hemolysis in the liver. Drug-free remission after first-line treatment with steroids, as seen in this case, also appears to be rare, though exact incidence is unknown. To minimize morbidity and mortality, physicians should be familiar with the presentation of ES and consider the diagnosis in all patients with evidence of ITP or AIHA.

DISTRICT OF COLUMBIA POSTER FINALIST - CLINICAL VIGNETTE Mitra Moazzami

Fulminant Autoimmune Hepatitis and Pulmonary Fibrosis: An Unusual Presentation

Title

Fulminant Autoimmune Hepatitis and Pulmonary Fibrosis: An Unusual Presentation

Authors

Mitra Moazzami MSPH, Ishaan Dharia BA, Victoria Garland MD, Kathryn Humes MD, Marie L. Borum MD, EdD, MPH. Department of Medicine, The George Washington University

Introduction

Autoimmune hepatitis (AIH) has marked variability in clinical manifestations—it can range from asymptomatic, pre-clinical disease to acute liver failure and cirrhosis, sometimes requiring liver transplant (1-3). The purpose of this case study is to outline an unusual presentation of AIH and explore the association of AIH and pulmonary fibrosis.

Case Presentation

A 66-year-old woman with a history of obesity, hypertension, diabetes, vitiligo and alopecia presented to the emergency department with 2 weeks of dizziness and dyspnea. Her exam showed stable vital signs with 97% O2 sat and scleral icterus. Liver enzymes revealed aspartate transaminase (AST) 4,091 U/L, alanine aminotransferase (ALT) 1,720 U/L, alkaline phosphatase 321 U/L and total bilirubin 8.3 mg/dL with PT 16.9 / INR 1.37, prompting hospitalization. She denied personal and family history of liver disease, blood transfusions, alcohol, drug and supplement use. She had a 24-pack year smoking history. Medications included atorvastatin, insulin, metformin, amlodipine, fluticasone and benzonatate. Review of outpatient records from a few years prior revealed mildly elevated liver enzymes (AST: 98 IU/L, ALT: 100 IU/L) attributed with non-alcoholic steatohepatitis and a positive ANA. Rheumatology consultation was recommended, but patient did not arrange. Imaging was not performed at that time. Upon admission, her MELD score was 26. Serologic evaluation was negative for chronic viral hepatitis and inherited liver disorders. Acetaminophen level was

Discussion

This is a rare case of AIH presenting as acute liver injury with underlying cirrhosis associated with pulmonary fibrosis. Fulminant hepatitis with jaundice and coagulopathy, as seen in this

case, is unusual. Inpatient treatment was required for this patient given the possible need for a liver transplant. As seen here, labs can reveal elevated liver enzymes and positive autoantibodies, including positive ANA and ASMA (4, 5). Pulmonary disorders with AIH is estimated to occur in

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FLORIDA POSTER FINALIST - CLINICAL VIGNETTE Andrew Collins

Malignant Ameloblastoma with Hepatic Metastasis: A Rare Case Report

Title

Malignant Ameloblastoma with Hepatic Metastasis: A Rare Case Report

Authors

Andrew P Collins BS, Naser Mubarak MPH, Sami Hemaidan, Hadi Hemaidan, Ammar Hemaidan MD

Introduction

Primary malignant ameloblastoma is a very rare tumor of the dental lamina epithelium. Like the benign ameloblastoma, the mass is histologically benign, but the malignancy may be locally aggressive with metastases, most commonly to the lungs [1,2]. These are very rare tumors, constituting less than 2% of all odontogenic tumors, and roughly 4% of ameloblastoma [3,4]. The average age of diagnosis if 34-years, while the median survival from the time of diagnosis is 17.6-years. The tumor most often presents with slow-growth, and a standard of care has not yet been established due to the rarity of the disease [5-10].

Case Presentation

A 39-year-old female presented with right sided abdominal pain, a palpable mass, and recurrent mandibular/maxillary mass. She was experiencing abdominal distention and diffuse tenderness on her right side with no other notable indications. Past medical history included surgical removal of a large mandibular ameloblastoma that reached over two pounds, measuring 30 cm in diameter, making it impossible to consume solid foods. The tumor encompassed the entire mandible from angle-to-angle, down to the lower tracheal region with the lower lip displaced inferiorly to her chest. The tumor was surgically removed in 2014. In 2016, at the current presentation, the patient experienced an aggressive recurrence of the malignancy in the floor of her mouth and neck, and a large hepatic mass of the right lobe. This oral mass was removed, and the recurrent tumor involved only soft tissues, appearing half the size of the original tumor. All major and minor salivary glands were involved into the tumor. She has no history of smoking or drinking and no family history of malignancy; lab findings indicated severe hypercalcemia. CT imaging of the recurrent malignant ameloblastoma revealed a submandibular mass, measuring 16.0 cm in anteroposterior diameter. The mass contained both soft tissue and numerous ossifications. Additionally, it displayed lytic destruction to the right of

the midline and demonstrated a multiloculated cystic appearance with floating teeth. These CT findings are consistent with a multicystic ameloblastoma. The hepatic mass showed cytology consistent with metastatic ameloblastoma.

Discussion

Odontogenic neoplasms are uncommon tumors affecting the oral cavity. While the odontoma is the most common odontogenic neoplasm, ameloblastoma falls a close second in incidence [2]. Since 1923, only 100 cases of malignant ameloblastoma have been described [11]. Since cytological atypia have not been excluded in the diagnostic criteria for malignant ameloblastoma, cases may be misclassified malignancies of other origins [12]. On average, patients are diagnosed at 34-years, with a range from 5 to 74-years [13]. The most common site of primary ameloblastoma is the angle of the mandible [14]. Approximately 75-88% of metastatic sites include the lungs, often following local recurrences [15]. Treatment regiments for malignant ameloblastoma have not been well established. While local masses should be resected, radiotherapy and chemotherapy results for metastases have been unpredictable. There are too few cases to consider randomized trials analyzing treatment methodology. Despite this, the median survival from the time of diagnosis is 17.6-years, and increased age at diagnosis is associated with poorer survival [5-10].

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FLORIDA POSTER FINALIST - CLINICAL VIGNETTE Rachel Fields

Chronic Disease Management in Sickle Cell Trait Patients in the Primary Care Setting: A Case Report

Title

Chronic Disease Management in Sickle Cell Trait Patients in the Primary Care Setting: A Case Report

Authors

Rachel N. Fields, Suzanne Minor MD

Introduction

Sickle cell disease (SCD) is a heterogeneous group of inherited hemoglobinopathies associated with mutations in the beta subunit of the hemoglobin protein. It can present with a variety of complications that revolve around a general pathophysiology of vaso-occlusive pain crises. Many case reports have been published that indicate having a single copy of the mutant sickle cell allele, known as Sickle Cell Trait (SCT) may not be a benign state as originally hypothesized. SCT is the most common hemoglobinopathy in the United States, affecting one in 12 (8-10%)f African American individuals [1,5]. Given the large number of SCT patients in the United States, physicians need to be prepared to handle acute complications and long-term management of SCT-related complications. The management of comorbid conditions is also affected by the SCT genotype as well as preventive medicine management as these patients can experience the same functional asplenia and increased risk of cerebrovascular accidents, kidney disease, and cardiovascular effects as SCD patients

Case Presentation

A 63 year old Hispanic male with past medical history of Type 2 Diabetes Mellitus (T2DM), Stage I Nonalcoholic fatty liver disease, hyperlipidemia and erectile dysfunction presented to the primary care clinic for follow up after hospital admission for splenic infarction. The patient began to have left upper quadrant pain while on a trip to Peru (at high altitude) associated with shortness of breath and an O2 saturation of 63%. CT showed a 2 cm subcapsular splenic hematoma, grade 2 and he underwent splenic artery embolization on hospital day 3. Blood was drawn for hemoglobin electrophoresis and the patient was given a new diagnosis of SCT based on a hemoglobin S percentage of 42.6%. After an otherwise benign work-up, the patient was diagnosed with splenic infarction secondary to splenic syndrome.

Discussion

This case contributes supporting data that SCT patients are at risk for vaso-occlusive crises in high physiologic stress environments and emphasizes the importance of considering SCT pathophysiology in the management of chronic illnesses in the primary care setting. Tight control of hyperlipidemia, coronary artery disease, hypertension, and T2DM is required to reduce the risk of SCT-related complications. Further studies and the development of T2DM screening and management guidelines are needed in order to optimize T2DM care in SCT patients. Preventive care and education must also be performed diligently in these patients as they are at an increased risk for infections and adverse events in high-stress environments. Patients require close follow-up of vaccination status as well as periodic optometry visits. The development of guidelines needs to be addressed for some of the SCT/SCD-related complications such as retinal and renal pathologies. Extensive education on exercise safety and concerning symptoms of SCT-related complications and diseases is essential. A public health concern is also brought to light as many patients with sickle cell-related disorders are living unaware of their diagnosis, placing them and their future generations at risk for SCT or SCD-related complications.

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FLORIDA POSTER FINALIST - CLINICAL VIGNETTE Maya Khodor

Stent Migration to the Pulmonary Artery: A Rare and Potentially Devastating Complication of Peripheral Endovascular Stenting

Title

Stent Migration to the Pulmonary Artery: A Rare and Potentially Devastating Complication of Peripheral Endovascular Stenting

Authors

Maya Khodor, American University of the Caribbean Sara Khodor, MD, Beaumont Hospital Mahir Elder, MD, Beaumont Hospital

Introduction

Venous stent migration to the pulmonary circulation is an uncommon but potentially devastating complication. A few reports describe stent migration to the right atrium, right ventricle and pulmonary artery. Unfortunately, guidelines on the management of endovascular stent migration are not well established. In this report, we discuss a case of stent migration from an arteriovenous graft (AVG) to the right pulmonary artery. We review other rare reported cases in the literature and discuss our management strategy.

Case Presentation

This is a case of a 49-year-old female with ESRD on hemodialysis, who had a fistulogram performed by interventional radiology due to high blood pressures during dialysis and prolonged bleeding. The fistulogram of her right brachial-axillary AV graft showed a 90% stenosis of the venous outflow anastomosis. Balloon angioplasty was performed; however, was complicated by rupture of the venous anastomosis which was successfully repaired by deploying 2 peripheral stents. She presented 8 months later with symptoms of shortness of breath and dyspnea. A chest X-ray was performed and showed a dislodged AVG stent to the right pulmonary artery. A CT scan was then performed and showed a radiopaque stent in the right main pulmonary artery outflow tract and extending to one of the central and medium-sized right lower lobe pulmonary artery branches. There was no obstruction of flow on imaging. She was managed with warfarin therapy. A repeat CT scan 1 month later showed no evidence of migration or change in the location of the stent. CT surgery was consulted and deferred surgical retrieval of the stent due to concerns for complications.

Discussion

Distant venous stent migration is a rare complication with an incidence rate reported to be as low as 2-3% (1, 2, 3, 4). Stent migration can be related to under-sizing, inadequate fixation of the stent to the vessel wall, or placement at highly mobile limb sites. Although, the majority of distant stent migration to the pulmonary circulation is found incidentally; patients can present with symptoms of dyspnea and/or pleuritic chest pains. They can also present more critically with hemoptysis due pulmonary infarction which can be fatal (5). In the absence of well-established guidelines for the management of distal stent migration to the pulmonary circulation; two general approaches have been pursued, surgical and/or percutaneous stent retrieval and conservative "wait and see approach". (4) The Invasive approaches in the literature include; percutaneous stent retrieval, repositioning with balloon catheters to lower risk locations, median sternotomy and pulmonary artery incision, and palliative pneumonectomy (4). It is our opinion that the management decision of distant stent migration to the pulmonary vasculature should be a multidisciplinary effort with a focus on the specific clinical situation and institutional experience to make the best recommendation for the patient. In our patient's case, she was stable with no signs of obstruction to flow. The stent remained stable in location on follow up imaging. After in depth multidisciplinary discussions, we decided to pursue conservative management with warfarin treatment indefinitely as long as the patient is able to tolerate it.

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FLORIDA POSTER FINALIST - CLINICAL VIGNETTE Erin O'Keefe

Hyperbaric Treatment of Spontaneous Clostridial Myonecrosis and Concurrent Colonic Malignancy

Title

Hyperbaric Treatment of Spontaneous Clostridial Myonecrosis and Concurrent Colonic Malignancy

Authors

Erin O'Keefe: University of Miami Miller School of Medicine Jorge Florindez, MD MS: University of Miami Miller School of Medicine

Introduction

Gas gangrene, or myonecrosis, is a rare and lethal infection of the skin which is rapidly progressive with mortality rates greater than 67%, most within the first 24 hours. Early clinical suspicion and rapid initiation of treatment is paramount. Standard treatment typically consists of early debridement of the wound with vascular repair and IV antibiotic therapy. Additionally, hyperbaric oxygen is continuing to be studied as a potentially efficacious treatment modality.

Case Presentation

A 51-year-old African American male presented to the Emergency Department with acute onset of fever, vomiting, dyspnea, and pain in his left foot. He states he went to bed with no concerns and woke in the middle of the night with repeated episodes of vomiting. He noticed a blister on the anterior aspect of his left foot with associated erythema and 10/10 pain. The patient has a history of Diabetes Mellitus Type II with neuropathy and prior amputation of the rights toes and metatarsals 4 and 5. On exam, he was ill-appearing, hypotensive, tachycardic, and febrile. There was notable erythema with possible crepitus, which was rapidly progressing up his foot to the lower leg,. There were no signs of trauma, injury, or burn. Initial labs demonstrated neutrophil predominant leukocytosis with a WBC count of 16,300 and a hemoglobin of 9.1. Creatinine Kinase and LDH were also elevated at 535 and 252 respectively. Xray of the left foot demonstrated soft tissue gas and the patient was started on IV antibiotics with anaerobic coverage including clindamycin, meropenem, and vancomycin. The patient was then admitted to the Surgical Intensive Care Unit. Six hours after admission, the patient underwent incision and drainage of multiple abscesses on the left foot and ankle with extensive debridement of the necrotic tissue. Hyperbaric Oxygen Treatment was initiated as adjunctive therapy 72 hours post-admission, completing 5 sessions over the next 10 days. Blood cultures revealed Clostridium Septicum. GI was consulted given the association between C. Septicum and

increased risk of underlying GI malignancy. Due to deteriorating stability, a below-knee amputation was performed to help prevent the spread of infection. Postoperatively he continued with hyperbaric treatments. Colonoscopy later revealed a large, carpet-like cecal polyp and right laparoscopic hemicolectomy was performed. Biopsy demonstrated intestinal adenoma with cells that stained positive for synaptophysin suggesting neuroendocrine origin.

Discussion

This case illustrates an example in which early suspicion and diagnosis of myonecrosis followed a rapid instauration of IV antibiotics, surgical debridement, and hyperbaric oxygen treatment was proved to be highly effective in the treatment of spontaneous myonecrosis caused by C. septicum. Moreover, it highlights the prior reported association between C. septicum and cancer particularly of GI origin as in our case; therefore, it is important to complete a workup for malignancy in patients with this particular presentation. It is believed that the hypoxic environment created by the tumor promotes the germination of clostridial spores in the GI tract and the disruption of the normal barrier by the tumor causes translocation of this sporulated bacteria from the bowel into the bloodstream leading to fulminant sepsis.

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FLORIDA POSTER FINALIST - CLINICAL VIGNETTE Dan B Tran

RAPID RECOVERY OF SEVERE CARDIOMYOPATHY: AN ATYPICAL PRESENTATION OF TAKOTSUBO CARDIOMYOPATHY GLOBAL VARIANT

Title

RAPID RECOVERY OF SEVERE CARDIOMYOPATHY: AN ATYPICAL PRESENTATION OF TAKOTSUBO CARDIOMYOPATHY GLOBAL VARIANT

Authors

Dan B Tran BS, Heitor G Lopes MD, Amit Kalra DO, Andrew D Bromley MD, Robert B Stang MD

Introduction

Takotsubo Cardiomyopathy (TCM) is an uncommon cardiac phenomenon that often presents as a mimic of acute coronary syndromes (ACS) in the absence of obstructive coronary disease with apical ballooning and preserved basal wall function1. However, TCM can rarely present as a global cardiomyopathy2. We report a case of an older gentleman thought to have developed severe cardiomyopathy with global left ventricular (LV) hypokinesis, who spontaneously recovered, with a return to normal ejection fraction (EF) and ventricular wall thickness several days later. The importance and implications of clinical diagnostic and management strategies for atypical variants of suspected TCM are discussed along with our case approach.

Case Presentation

A 79-year-old gentleman with hypothyroidism and COPD presented to the ER with a chief complaint of urinary retention. Vitals revealed significant asymptomatic hypotension with BP of 85/52 and mean arterial pressure of 63. On general appearance, he appeared thin and cachectic and remaining physical exam was unremarkable. Fluid resuscitation was provided, and he was admitted. EKG showed low voltages in limb leads and CXR showed expanded lung volumes. Labs revealed elevated serum lactate (4.5 mmol/L) and elevated TSH (16.0 mIU/mL). Blood cultures and urine cultures were negative. Echocardiography revealed an EF of 5-10% with severe global LV hypokinesis and a moderately-sized pericardial effusion without tamponade. Notably, his right ventricle was normal in size with preserved function. He was started on inotropic and hemodynamic support. CT scans were unremarkable for underlying malignancies and repeat blood cultures were negative. Catheterization for evaluation of ischemic etiologies was declined. Given his poor prognosis, the palliative/hospice care team was consulted for goals of care. On day six, repeat echocardiography to monitor his pericardial effusion incidentally revealed recovered LV EF of 55-60% with normal LV wall thickness and motion, leading to high clinical suspicion of TCM. The patient was successfully weaned off

vasopressors and inotropes with sustained hemodynamic stability and resolution of serum lactate elevation.

Discussion

While TCM is often associated with favorable recovery, full diagnostic workup for patients presenting with likely ACS or severe cardiomyopathy according to evidence-based guidelines should take priority. Despite similarities of EKG findings and biomarker elevations in TCM with other acute cardiac pathologies, TCM is usually a diagnosis of exclusion requiring ischemic workup with coronary angiography to exclude obstructive coronary disease3 (though declined by our patient). Importantly, for suspected TCM variants presenting with severe cardiomyopathy, repeated echocardiography may be useful and/or diagnostic. This allowed distinguishing TCM wall motion abnormality variants from true end-stage cardiomyopathy by establishing reversibility over days, a hallmark TCM feature. Despite TCM's reversibility, maintenance of hemodynamic stability is necessary to prevent severe hemodynamic complications4, like our patient's requirement for vasopressors. Up to 20% of patients with TCM experience moderate to life-threatening complications during hospitalization5. Therefore, though TCM's acute presentation is difficult to initially differentiate from ACS or severe cardiomyopathies, thorough history-taking, assessment of risk factors, and routine cardiac studies may be helpful in suspecting the diagnosis. Guideline-directed cardiac workup and management should form the standard of care for suspected TCM, even in atypical clinical presentations.

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GEORGIA POSTER FINALIST - CLINICAL VIGNETTE Paul Tran

Atypical Hemolytic Uremic Syndrome Diagnosis in the Setting of Plasma Exchange Resistant Thrombotic Microangiopathy

Title

Atypical Hemolytic Uremic Syndrome Diagnosis in the Setting of Plasma Exchange Resistant Thrombotic Microangiopathy

Authors

Paul Tran, Thuy Le MD, Allan Krutchik, MD; Asha Nayak, MD

Introduction

Thrombotic microangiopathies are a group of hematological disorders which commonly start with a stress or insult which results in autoimmune attack of elements of the clotting pathway resulting in thromboses, thrombocytopenia, and often kidney injury. The three main disorders are thrombotic thrombocytopenic purpura (TTP), hemolytic uremic syndrome (HUS), and complement-mediated thrombotic microangiopathy (C-TMA, formerly atypical HUS).

Case Presentation

We report a case of a 17-year-old African-American G1P1001 postpartum female with a past medical history of T-cell acute lymphoblastic leukemia in remission who presented to Augusta University Medical Center (AUMC) for workup and management of hemolytic anemia. During her peripartum stay at a regional hospital, she received 4U red blood cells and 2U platelets. On admission, she was not in pain and denied any nausea, vomiting, diarrhea, abdominal pain, visual changes, or headache. Her blood pressure was 130/80 mmHg, temperature was 36.8 C, and physical exam was significant for a grade 3 vaginal tear from her spontaneous vaginal delivery. Her laboratory findings were notable for hemoglobin 11 (baseline 11.5), platelet count 21,000 (baseline 307,000), D-dimer 980, fibrinogen 521, INR 0.9, BUN 27 (baseline 8), serum creatinine 1.79 (baseline 0.54), AST 34 (baseline 17), ALT 11 (baseline 15), total bilirubin 2 (baseline 0.3) with direct bilirubin 0.5, LDH 1384, and haptoglobin undetectable. Peripheral blood smear was significant for moderate amount of schistocytes. Based on these findings, her PLASMIC score was 7, indicating a high risk of TTP. Hemolysis, elevated liver enzymes, and low platelet count (HELLP) syndrome was considered given her post-partum status but was felt to be less likely given her unremarkable liver enzymes. Her ADAMTS13 level was sent out for testing and she was started on urgent plasma exchange. The plasma exchange initially improved the thrombocytopenia. However, her hemolytic anemia and renal function continued to worsen, leading to multiple transfusions and subsequent transfusion-associated circulatory

overload. Due to her worsening clinical status in the setting of multiple rounds of plasma exchange, a presumptive diagnosis of aHUS was made and she was started on eculizumab. At this point, her renal function had worsened to the point of needing hemodialysis. Her ADAMTS13 activity was later found to be 68%, further confirming the aHUS diagnosis. After several weeks of weekly eculizumab therapy, her renal function improved and hemodialysis was no longer required.

Discussion

This case emphasizes that in cases of presumed TTP, worsening renal function and thrombocytopenia in the setting of continued plasmapheresis should raise the clinician's index of suspicion for aHUS. This is of utmost importance since early management of aHUS with eculizumab may lead to quickly improved renal function and possible avoidance of renal replacement therapy.

ILLINOIS POSTER FINALIST - CLINICAL VIGNETTE Matthew S Lee

The Silver Lining in a Cytokine Storm Cloud: Hemophagocytic Lymphohistiocytosis due to Diffuse Large B-cell Lymphoma

Title

The Silver Lining in a Cytokine Storm Cloud: Hemophagocytic Lymphohistiocytosis due to Diffuse Large B-cell Lymphoma

Authors

Matthew Lee, MS1,2, Jian Zhuang, PhD1,2, and Priyank Patel, MD2,3

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Introduction

Hemophagocytic lymphohistiocytosis (HLH) is a rare, life-threatening condition of excessive immune activation. The pathogenesis is thought to involve NK- and CD8+ T-cell dysfunction, hindering their ability to eliminate over-activated macrophages, which potentiates excess cytokine secretion and tissue damage.

HLH in adults is often secondary to malignancy, most commonly T-cell or NK-cell lymphomas. HLH associated with B-cell lymphomas are uncommon, with most cases reported in East Asia. Lymphoma-associated HLH carries a grim prognosis - median survival is 3 months for T/NK-cell associated HLH, and 9 months for B-cell forms.

Case Presentation

A 45-year-old African American male with no documented medical history other than alcohol abuse presented with diarrhea and a 60-lb weight loss over two months. He was febrile and tachycardic; labs revealed pancytopenia, transaminitis, hyperbilirubinemia, and lactic acidosis. He was admitted for severe inflammatory response syndrome.

Upon workup for HLH, he met 5/8 of the HLH-2004 criteria: fever, splenomegaly, pancytopenia, hypofibrinogenemia, and severe hyperferritinemia (13515.4 ng/mL). Epstein-Barr virus (EBV) IgM and PCR were negative. CT-scan revealed diffuse lymphadenopathy and lesions in the liver, spleen, and bone. Serum interleukin-2 (sIL-2) receptor was elevated (48800 pg/mL, reference

value ≤1033 pg/mL), affirming the diagnosis of HLH. Inguinal lymph node biopsy revealed sheets of large atypical cells with irregular multilobulated nuclei, prominent nucleoli and ample cytoplasm. The abnormal cells were positive for CD20, CD79a, PAX5, BCL6, MYC, MUM1 and negative for CD5, CD10, BCL2, consistent with diffuse large B-cell lymphoma (DLBCL), non-germinal center B-cell-like subtype. EBV-RNA was negative and Ki67 proliferative index was >90%. Molecular studies excluded abnormalities in Bcl2, Bcl6, or C-myc. Bone marrow biopsy showed erythrophagocytosis, and confirmed DLBCL involving the bone marrow. Immediately after diagnosis, patient was started on chemo-immunotherapy with R-CHOP (rituximab, cyclophosphamide, doxorubicin, vincristine, prednisone).

After completing 6 cycles of R-CHOP and two cycles of intrathecal methotrexate for CNS prophylaxis, the patient is currently in clinical remission from DLBCL per PET scan, with no HLH recurrence at 9 months post-diagnosis.

Discussion

HLH classically presents in children with mutations in the perforin-granzyme pathway, which is important for cell killing by NK/T-cells. In adults, HLH is usually related to an underlying trigger, most commonly infection, followed by malignancy and autoimmune disease1,2. One hypothesis for the development of HLH in cancer is the excessive secretion of cytokines (interferon-gamma, sIL-2, and IL-6) by tumor cells, precipitating a cytokine storm that then causes over-stimulation of non-malignant macrophages3.

We present the unique case of an African American patient with HLH secondary to DLBCL who responded exquisitely to chemo-immunotherapy. It is often difficult to diagnose underlying lymphoma in a patient presenting acutely with HLH; this delays lymphoma treatment and increases mortality. Our case provides the silver lining that prompt treatment of the underlying lymphoma portends a much better prognosis. Indeed, other reports of lymphoma-associated HLH also suggest that early and aggressive treatment of the underlying malignancy improves survival4,5,6. As most cases of adult HLH are secondary to a triggering condition, this highlights the importance of diagnosing and treating the trigger in order to improve patient outcomes.

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ILLINOIS POSTER FINALIST - CLINICAL VIGNETTE Jialing Li

Diagnosing An Extremely Rare Type of Soft Tissue Sarcomas

Title

Diagnosing An Extremely Rare Type of Soft Tissue Sarcomas

Authors

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Introduction

Epithelioid hemangioendothelioma (EHE) is an extremely rare type of vascular neoplasm composed of epithelioid or histiocytoid cells with endothelial characteristics. In the United States, the incidence of EHE is approximately 1/1,000,000. Due to its rarity, EHE is especially challenging to diagnose, and its presenting symptoms and complications can direct physicians to a variety of differential diagnosis. Consequently, in the process of working up all possible differential diagnosis, patients can suffer from excessive or unnecessary procedures, prolonged durations of hospitalization, and a decreased quality of life, all at the expense of wasted medical resources.

Case Presentation

A 58-year-old man with a PMH of CVA, poly-substance abuse, schizophrenia, and depression, presented to the ED due to worsening SOB and hemoptysis for 4 weeks. The patient endorsed weight loss of 65 lbs. in the last five months. A CT of the chest showed bilateral pleural effusions, a collapsed left lower lobe and a mass that obstructed the left lower lobe airways. Due to the patient's nursing home living status and multiple prior incarcerations, workups for TB, HIV, and COVID-19 were completed. After confirming all negative results from the above tests, an investigation for a potential pulmonary malignancy was started. The patient’s lab results and clinical presentation did not show any signs of paraneoplastic syndromes. However, a bronchoscopy later revealed an erythematous, actively bleeding endobronchial mass measuring 11 mm obstructing the opening of the secondary bronchi leading to the left lower lobe. Three sessions of bronchoscopy with biopsies from multiple sites of the mass and bronchial brushings were done within the span of 20 days. Two sessions of thoracentesis removed a total of 850 cc of bloody exudate from the left pleural space. However, cytology and pathology studies of all collected samples were negative for malignancy. On day 24 of hospitalization, VATS (video-assisted thoracoscopic surgery) was performed, and multiple small, necrotic nodules were found on the right pleura. Pathology of these nodules showed two architectural patterns: epithelioid and histiocytoid cells, which are compositions of EHE.

Immunohistochemical stains confirmed endothelial differentiation of the samples: endothelial marker CD31, Fli-1, and ERG were strongly positive. In addition, neuroendocrine marker synaptophysin was positive, which is strongly associated with EHE. This patient had all adverse prognostic factors, including symptomatic EHE, male sex, age over 55 years, and pleural involvement. According to currently available clinical data, the median survival time is approximately 1 year for these patients. After multiple discussions about the diagnosis, prognosis, and possible treatment plan, the patient decided on a palliative care placement with DNR and DNI agreement.

Discussion

This case demonstrates the challenges in diagnosing a metastatic pulmonary EHE. Due to its rarity and overlapping clinical presentations with other possible pulmonary diseases, pulmonary EHE required an extensive workup procedure. Therefore, when suspecting a possible malignancy, submitting biopsy samples for immunohistochemical study rather than routine histological study earlier in the investigative process might help to expedite the process of diagnosing rare malignancies, decrease the duration of hospitalization, reduce the wasting of medical resources, and improve the quality of life.

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ILLINOIS POSTER FINALIST - CLINICAL VIGNETTE Maria Mihailescu

Non-healing leg ulcers in a patient on warfarin in the absence of significant systemic illness: a challenging clinical case

Title

Non-healing leg ulcers in a patient on warfarin in the absence of significant systemic illness: a challenging clinical case

Authors

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Introduction

Calciphylaxis is a rare and life-threatening form of metastatic vascular calcification that usually occurs in the setting of chronic systemic illness, most commonly chronic kidney disease. Herein, we present an unusual case of calciphylaxis occurring in an otherwise healthy patient with psoriasis and polycythemia vera in the absence of significant systemic disease.

Case Presentation

A 58-year old obese woman with a history of psoriasis (BSA 25%) and polycythemia vera presented to our clinic for evaluation of intensely painful right calf ulcers of 4 months' duration. She had no history of kidney disease and her medical history was otherwise unremarkable. Daily medications included oral Vitamin D, topical calcipotriene cream, and 5mg of daily warfarin following a provoked DVT 8 years prior. Her JAK+ polycythemia vera had been managed with intermittent phlebotomy and stable for 20 years. The patient reported the initial development of a 1cm "dark purple bruise" at the site of a psoriatic plaque she had peeled off one month prior. Over the next 4 months, the lesions ulcerated and expanded and she developed additional peripheral lesions that were extremely painful. Evaluation revealed no recent fevers, symptoms of vasculitis, or gastrointestinal complaints. Cutaneous exam demonstrated several large, exquisitely tender, necrotic ulcers (largest 4 × 5 cm) extending to the fascia with underlying induration and livedo reticularis on the right posterior calf. Laboratory studies reveled normal serum urea nitrogen, creatinine, calcium, phosphorus, parathyroid hormone, and total 25-hydroxy-vitamin D. Workup for thrombophilia and

rheumatologic disease was negative. Punch biopsies demonstrated lace-like foci of calcification within the subcutaneous adipose tissue confirmed by Von Kossa stain. A diagnosis of calciphylaxis was established. The patient was admitted for pain control and multidisciplinary medical management. Warfarin and vitamin D analogs were discontinued, and the patient was treated with a combination of intravenous sodium thiosulfate (STS), intralesional STS, and intravenous pamidronate with complete resolution at 4-month follow-up.

Discussion

Our case is a rare example of calciphylaxis in a patient with no significant systemic illness. Calciphylaxis is most commonly observed in patients with end-stage renal disease on dialysis. In nonuremic cases, calciphylaxis is associated with malignancy, liver disease, rheumatologic disease, and hyperparathyroidism. The condition carries significant morbidity and mortality, with a one-year survival of 40-50%. Mortality rate rises to 80% once ulceration develops, highlighting the rare and positive outcome of our patient's case. Diagnosis is typically based on characteristic cutaneous findings such as ulcerations, induration, and livedo and may be supported by biopsy. We suspect that our patient's use of offending medications such as warfarin and topical and oral vitamin D analogs promoted a pro-mineralizing microenvironment suitable for disease propagation following local trauma from disruption of psoriatic plaques. In the setting of known risk factors, such as female gender, obesity, warfarin use, and vitamin D analog use, a high index of suspicion for calciphylaxis should be maintained while evaluating characteristic lesions, even in the absence of chronic disease.

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IOWA POSTER FINALIST - CLINICAL VIGNETTE Arianna Dalamaggas

Severe necrotizing fasciitis presenting in a 32-year-old male with COVID-19

Title

Severe necrotizing fasciitis presenting in a 32-year-old male with COVID-19

Authors

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Introduction

COVID-19 has been attributed as a cause of death in millions of individuals. Patients who develop this infection suffer a number of complications including acute respiratory distress syndrome, secondary infections, and thromboembolic events. Pneumonia remains the major complication, characterized by fever, cough, dyspnea, and bilateral patchy ground glass infiltrates on chest computed tomography (CT). COVID-19 can additionally manifest in secondary infections, though the correlation with severe infections such as bacteremia or necrotizing fasciitis is incompletely established. Necrotizing fasciitis, a rapidly spreading severe infection of soft tissues attributable to multiple pathogens, presents with fever, pain, and localized edema. Treatment requires debridement and fasciotomy to preserve viable soft tissue. Lastly, although the hypercoagulable state in the setting of COVID-19 is incompletely understood, these patients are at an increased risk for thromboembolism. The case we present here is of a 32-year-old male who after diagnosis with COVID-19 experienced complications to include ARDS and necrotizing fasciitis due to Pseudomonas aeruginosa.

Case Presentation

Our patient has a past medical history of hypertension and morbid obesity, presenting to the emergency department with loss of taste and smell and shortness of breath progressing to weakness, dyspnea on exertion, and hemoptysis. On examination, he was afebrile, tachycardic, hypertensive, tachypneic, and hypoxic. Laboratory studies showed leukopenia, elevated lactic acid, thrombocytopenia, anemia, and elevated D-Dimer. The patient was started on azithromycin and ceftriaxone for bacterial pneumonia and therapeutic enoxaparin for DVT. A positive nasopharyngeal swab for SARS-CoV-2 was received, prompting initiation of dexamethasone, remdesivir, and convalescent plasma. The patient's respiratory status improved over the subsequent week; however, he developed new-onset right lower extremity

pain with edema and erythema. He rapidly decompensated, experiencing shock, worsening respiratory failure, and severe hypotension. The patient was intubated, given multiple doses of vasopressors, and aggressive fluid replacement. Blood gas analysis showed mixed metabolic and respiratory acidosis. Bicarbonate drip and antimicrobials including vancomycin, meropenem and clindamycin for possible necrotizing infection were given, later confirmed by Pseudomonas aeruginosa positive blood cultures. The next day, the limb became cold, bullous, and mottled, with absent capillary refill and pulses. Debridement with fasciotomy showed extensive subcutaneous and muscle tissue necrosis. The patient again became hypotensive with minimal response to bicarbonate, calcium, epinephrine, crystalloids, and blood products. Through-the-knee disarticulation was performed due to extensive necrosis. Despite all efforts, he remained severely hypoxemic with severe mixed acidosis; therefore, continuous renal replacement therapy (CRRT) was initiated, with minimal success. Multisystem organ failure was diagnosed with no response to aggressive therapy. After discussion with the family, the patient was compassionately extubated.

Discussion

Our patient experienced rapid respiratory and hemodynamic deterioration after clinical improvement from COVID-19, complicated by necrotizing fasciitis, worsening respiratory status, and shock requiring intubation, vasopressors, and CRRT. The severe skin infection this patient developed was from a bacterial pathogen highly uncommon among all types of necrotizing fasciitis, Pseudomonas aeruginosa. Infections of this etiology are commonly nosocomial, which cannot be excluded as a source of infection. This case serves as a reminder to critically evaluate patients with COVID-19 for secondary complications throughout their hospitalization.

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KENTUCKY POSTER FINALIST - CLINICAL VIGNETTE Esther Bak

Case Report-A case of Rothia dentocariosa endocarditis with severe complications

Title

Case Report-A case of Rothia dentocariosa endocarditis with severe complications

Authors

Esther Bak, MS4, University of Louisville; Nicole Giddens, MD, University of Louisville; Tyler Sharpe, MD, University of Louisville

Introduction

Infective endocarditis (IE) is a relatively rare but life-threatening disease with multisystem effects resulting from bacterial infection of the heart's endocardial surface. It disproportionately affects those with structural/valvular heart disease or prosthetic valves and intravenous drug users. While IE with negative cultures may be seen in fungal and bacterial infections alike, streptococci/staphylococci have accounted for approximately 80% of positive culture cases.(3) However, only a few cases of Rothia dentocariosa endocarditis have been reported to date. Cardiac manifestations of valvular vegetations usually involve the valve leaflet of atrioventricular/semilunar valves.(3) Large vegetations reaching up to several centimeters in diameter pose risk for valve perforation/rupture, and vegetations greater than 1cm warrant urgent surgical evaluation. Extra-cardiac manifestations include petechiae, cutaneous infarcts, cerebral emboli, neurovascular/cerebral aneurysms, splenic abscess/infarct, pulmonary septic emboli(4), and ophthalmic complications which all involve invasion of septic emboli to organ systems. With the exception of pulmonary emboli, all above mentioned manifestations were seen in the following case.

Case Presentation

A 61-year-old male patient with hepatitis C and IV drug use presented to the hospital with 3 days of weakness, chills, and headache. The patient was homeless and endorsed a 45+ year history of methamphetamine, cocaine, and active IV drug use. Bedside ultrasound revealed presence of vegetations. Patient was admitted with a diagnosis of IE and started on broad spectrum antibiotic coverage. Transesophageal echocardiography revealed a large, irregular, mobile 1.75x1.37cm mitral leaflet vegetation with severe regurgitation. Blood cultures resulted in growth of R.dentocariosa and patient was continued on vancomycin, awaiting sensitivities. Cardiothoracic surgery plans were placed, however, CT abdomen/pelvis showed an acute splenic infarct, and CT/MRI head showed acute/subacute infarcts likely to be septic emboli given the patient's history. Additionally, patient was was found to have acute angle-closure

glaucoma, requiring topical ophthalmic therapy awaiting iridotomy outpatient. Dental recommendations included multiple extractions as the infection likely stemmed from dental caries. New findings of acute hemorrhagic cerebral bleed delayed valvular surgery until after a 6-week antibiotic course. Upon receiving neurologic/cardiovascular clearance for surgery and successful dental extraction, the patient underwent total mitral valve replacement without complications. Post-operative echocardiogram showed left ventricular ejection fraction of 60%. Patient made a full recovery to discharge on post-operative day five.

Discussion

Rothia dentocariosa is a microbe that resides in the mouth and respiratory tract and rarely causes disease. Documented cases occur chiefly in patients with valvular or dental disease.(5) Only a few cases of R.dentocariosa endocarditis have been reported to date, almost exclusively in patients with an underlying heart condition as the predisposing risk factor.(6,7) This current case introduces a unique setting with the absence of a predisposing cardiac structural abnormality. History of intravenous drug use in conjunction with dental caries-facilitated bacterial seeding poses a more opportunistic narrative of the rare organism further substantiated by embolic sequelae that provide further evidence of the organism's invasive potential. This serves as evidence to support that R. dentocariosa can cause endocarditis in patients lacking structural heart conditions, which were previously known to be the primary and exclusive source of infective endocarditis caused by this organism.

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KENTUCKY POSTER FINALIST - CLINICAL VIGNETTE Daniel Belza

Kodamaea ohmeri Endocarditis: An Emerging Fungemia

Title

Kodamaea ohmeri Endocarditis: An Emerging Fungemia

Authors

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Introduction

Formerly known as Pichia ohmeri, Kodamaea ohmeri is a rare fungus that belongs to the same family as candida. It has previously been described in tree bark, fruits, salts used in the fermentation of pickled vegetables, sea water, pools, and sand. First reported in 1998, there has recently been an increasing number of identified cases of deadly, systemic Kodamaea infections. The following is another such case.

Case Presentation

A 29-year-old male presented with a 1-week history of dyspnea, cough, fever, fatigue, myalgia, and chest pain. Medical history included hepatitis C and intravenous drug use with meth, heroin, and suboxone. His last use was 1 week prior to presentation with IV suboxone. Pertinent surgical history consisted of bioprosthetic mitral valve replacement x2. Most recent replacement was 8 months prior secondary to recurrent MRSA endocarditis. His temperature was 98.4, heart rate 117, blood pressure 112/78 mmHg, and respiratory rate of 20 with oxygen saturation of 100% on 2 liters. On exam, he was a thin, ill-appearing male. He had decreased breath sounds and crackles at bilateral bases. There was moderate right upper quadrant tenderness, left flank tenderness, and an osler node at his left middle finger, along with 3+ pitting edema in bilateral lower extremities. BNP was 10424 pg/mL, sodium 133 mmol/L, leukocyte count 8.76 k/uL, hemoglobin 10.9 g/dL, AST 106 U/L, and ALT 105 U/L. Transthoracic echo showed findings consistent with right heart failure secondary to left heart failure, volume overload, and a large mitral valve vegetation. CT chest showed bilateral pleural effusions, right upper lobe consolidation consistent with pneumonia, and scattered opacities suggestive of pulmonary edema. Blood culture speciation grew Kodamaea ohmeri with susceptibility to Amphotericin. Given two previous valve replacement failures, patient was deemed a poor surgical candidate by cardiothoracic surgery. He was started on Amphotericin 5mg/kg/day for fungemia endocarditis and Ceftriaxone for pneumonia. Despite repeat blood cultures showing no growth after 2 days, the patient later developed acute renal failure secondary to poor

cardiac perfusion along with an acute transaminitis secondary to congestive hepatopathy. The patient ultimately decided to withdraw care, dying a few days later.

Discussion

Per literature review, 73 cases of fungemia have been identified to date, with only 3 resulting in endocarditis. Mainly occurring in immunocompromised individuals, other invasive infections of Kodamaea include peritonitis, cellulitis, and catheter-related urinary tract infection. Occurrence in immunocompetent individuals is rare. Reassuringly, Kodamaea has frequently shown sensitivity and successful treatment with Amphotericin B, as was the case with our patient. His cultures additional showed sensitivity to echinocandins, however, there is limited data with their use as Amphotericin is typically the anti-fungal of choice. Fungal endocarditis is a rare life-threatening condition that is at increased risk following interventional procedures. Even more rare is the colonization with Kodamaea ohmeri, as this is only the 4th case of endocarditis reported to date. Preventive measures and avoidance of pre-disposing risk factors should be stressed post-operatively, especially in those who are immunocompromised.

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KENTUCKY POSTER FINALIST - CLINICAL VIGNETTE Vanessa Fu

The Case of the Missing Multimers: Acquired von Willebrand Syndrome in a Patient with Hypertrophic Cardiomyopathy

Title

The Case of the Missing Multimers: Acquired von Willebrand Syndrome in a Patient with Hypertrophic Cardiomyopathy

Authors

Vanessa M. Fu, Fabrizio Canepa Escaro MD, Department of Internal Medicine, University of Kentucky HealthCare

Introduction

Gastrointestinal bleeding from angiodysplasia is common in patients with hypertrophic cardiomyopathy. This case highlights the importance of evaluating for acquired von Willebrand syndrome in this subset of patients given the favorable response to a septal myectomy.

Case Presentation

An 81-year-old woman with a history of hypertrophic cardiomyopathy (HCM) and prior gastrointestinal (GI) bleeding of unknown origin in 2017 presented with lightheadedness and anemia after undergoing an ERCP the day before. She had multiple episodes of maroon-colored stool and melena while in the ED and was transfused one unit of packed red blood cells. Physical exam was notable for a grade IV/VI systolic murmur loudest at the left lower sternal border and radiated to the carotids and the back. CTA confirmed active mucosal bleeding in the ascending colon and cecum. She later underwent a bidirectional endoscopy, which was unremarkable and did not demonstrate any active bleeding. Her echocardiogram showed a thick interventricular septum measuring 1.6 cm, systolic anterior motion of the mitral valve, and a significant resting left ventricular outflow tract (LVOT) gradient of 75 mmHg. Her Factor VIII and von Willebrand factor (vWF) antigen levels were both elevated. vWF:ristocetin cofactor to vWF:antigen ratio was 0.63 (abnormal

Discussion

In Heyde syndrome, increased shear stress across a stenotic aortic valve causes AvWS, which is characterized by increased proteolysis of vWF HMWM. The loss of HMWM impairs primary hemostasis, predisposes the patient to mucosal bleeding and GI angiodysplasias, and resolves after replacement of the valve. Few reports of an AvWS in HCM patients describe a similar

pathophysiology of proteolysis due to high shear stress from the LVOT obstruction. Le Tourneau et al. demonstrated that the degree of vWF impairment is strongly associated with the severity of obstruction, and a resting LVOT gradient of 15 mmHg is enough to cause abnormalities in vWF function. Furthermore, the association between angiodysplasias and vWF dysfunction is well-described in the literature. While angiodysplasias are considered a normal part of vascular aging, GI bleeding from these vascular malformations primarily occurs in patients selectively lacking VWF HMWM, suggesting that vWF multimers play an important role in regulation of angiogenesis in addition to hemostasis. This is further evidenced by cessation of spontaneous, mucosal, or excessive perioperative bleeding after a HCM patient with AvWS receives a septal myectomy and there is no longer a loss of HMWM. The relation between HMWM and GI bleeding therefore highlights the need for further investigation of AvWS in patients with conditions of high shear stress such as HCM. Workup should include vWF multimer analysis in addition to vWF antigen, ristocetin cofactor, and factor VIII levels, as it can often be the only abnormal finding. Management should be directed at decreasing the LVOT gradient with beta blockade, alcohol septal ablation, and most definitively with surgical septal myectomy.

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KENTUCKY POSTER FINALIST - CLINICAL VIGNETTE Emily Sara Hartman

Bilothorax Secondary to Percutaneous Microwave Ablation of Hepatocellular Carcinoma - Recognition and Management Practices

Title

Bilothorax Secondary to Percutaneous Microwave Ablation of Hepatocellular Carcinoma - Recognition and Management Practices

Authors

Emily Hartman BS, Agastya Belur MBBS, Steven McHenry MD, Apurv Agurwal MBBS, Jared Young BS, Kaitlin Gordon MD

Introduction

Bilothorax is a rare cause of exudative pleural effusion and most commonly occurs as a complication following percutaneous hepatobiliary procedures. Patients at risk should be evaluated with thorough physical examination, imaging of the chest and abdomen to identify potential empyema or biloma and thoracentesis for fluid studies to guide management.

Case Presentation

A 71-year-old male with hepatocellular carcinoma (HCC) from hepatitis B cirrhosis presented with right upper quadrant (RUQ) pain after a percutaneous microwave HCC ablation performed 2 weeks prior to presentation. On exam, vital signs were stable, and the patient had RUQ tenderness that was worse with inspiration and decreased breath sounds on the right. Labs on admission showed no leukocytosis and baseline mild transaminitis from cirrhosis. Chest x-ray revealed a pleural effusion and right basilar atelectasis. CT chest identified a right-sided loculated pleural effusion and a defect that extended from the liver into the loculated effusion. A chest tube was inserted on admission and two liters of sterile bilious pleural fluid were drained; fluid studies demonstrated a pleural fluid bilirubin of 13.2 mg/dL and serum total bilirubin of 1.1 mg/dL, consistent with a bilothorax. The patient initially had copious bilious drainage through his chest tube. A HIDA scan obtained to further define the diaphragmatic defect identified a high output biliary-to-pleural fistula originating near the percutaneous hepatic entrance site for the HCC ablation. These findings were confirmed on a magnetic resonance cholangiopancreatography. Surgical intervention was not warranted at this time and his common bile duct was stented via endoscopic retrograde cholangiopancreatography (ERCP),

improving the bilothorax. He was discharged once chest tube output was below 50 cc in 24 hours, with plans for placement of a PleurX catheter and oncology follow up as an outpatient.

Discussion

Bilothorax is a relatively uncommon clinical condition with approximately 60 cases reported in literature since 1960. All patients with suspected bilothorax should have an ultrasound or CT scan and a thoracentesis, as the most specific diagnostic feature is a pleural fluid-to-serum bilirubin ratio greater than 1.0. An article by Karnik et al showed that the most common etiology of bilothorax was iatrogenic causes due to cholecystectomy or other hepatobiliary procedures. Treatment of these patients involved broad-spectrum antibiotics, chest tube placement and biliary drainage, with surgical intervention reserved only for failure of conservative management or association of bilothorax with an abscess. There are currently no data demonstrating spontaneous resolution of a bilothorax. ERCP is an optimal option for identification of relevant anatomy and for therapeutic intervention. Prompt drainage and management of a bilothorax is necessary as there is a high propensity for development of life-threatening empyema or ARDS. We present this case to highlight the etiology, common management practices and complications of a rare clinical condition.

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KENTUCKY POSTER FINALIST - CLINICAL VIGNETTE Meenu Krishnasamy

AN ANGRY GUT IRRITATES THE BRAIN

Title

AN ANGRY GUT IRRITATES THE BRAIN

Authors

Meenu P. Krishnasamy BS, Alan M. Hall MD

Introduction

An eight-year-old girl presented with acute onset of dragging her left foot that quickly progressed to left sided hemiplegia with confusion and decreased vocalization. She had episodic hematochezia and abdominal pain for 6 months prior and was hospitalized for rehydration secondary to these symptoms one week before presentation.

Case Presentation

Her temperature was 38.2C with blood pressure 123/84 (above the 95th percentile), and heart rate 118. She needed stimulation to stay awake and was nonverbal but could follow commands. She had a right lateral gaze palsy and flaccid paralysis in the left upper and lower extremities. Abdomen was soft and non-distended, with mild, diffuse tenderness to palpation. WBC count was 22 k/uL with normal hemoglobin, and platelets of 165 k/uL. CRP was 71.5 mg/L and ESR 78 mm/hr. INR was 1.2 with PTT 33 sec and D-dimer >20.0 ug/mL. Atypical P-ANCA was positive and COVID-19 PCR was negative. CT venogram showed cerebral venous sinus thromboses (CVST) and intraparenchymal and subarachnoid hemorrhages within the right frontal and occipital lobes with associated edema. Considering the history of hematochezia and elevated inflammatory markers and P-ANCA, inflammatory bowel disease (IBD) coupled with dehydration likely led to CVST and venous hemorrhagic strokes. Her elevated blood pressures were likely secondary to increased intracranial pressure. She was treated with heparin and transitioned to enoxaparin after improvement of intracranial hemorrhages. Following neurological stabilization, she underwent EGD and colonoscopy. Histology and pathology were consistent with indeterminate colitis. She was started on adalimumab with improvement in symptoms but continues to have frequent hospitalizations for flares.

Discussion

The most common inciting factors for CVST in children are otitis media, mastoiditis and dehydration. Rarely, chronic inflammatory conditions (as in our patient) can be responsible. IBD, particularly ulcerative colitis, is a known risk factor for hypercoagulability, leading to an approximate three-fold increase in venous thrombosis events in adults; data is more limited in children but the available literature supports a similar increased risk. Anemia and steroid use, both common in patients with IBD, are also independent risk factors associated with CVST. Early diagnosis and good disease control are the mainstay of prevention of CVST in IBD patients, as there is a lower risk of thromboembolic events in remission. Anti-TNF alpha inhibitors, including adalimumab, have been shown to decrease thromboembolic risk in adults. Prophylactic anticoagulation is recommended routinely in adults hospitalized for IBD flares, but no studies exist to support such a recommendation in pediatric patients. The treatment of pediatric patients with CVST regardless of cause consists of anticoagulation for a minimum of three months with heparin transitioned to enoxaparin or warfarin (or potentially a direct-acting oral anticoagulant in the future). CSVT should be considered in any pediatric patient presenting with stroke-like symptoms, and anticoagulation should be started immediately after diagnosis. Early diagnosis of IBD (including close attention to red flag symptoms like hematochezia) is vitally important to decrease the risk for thromboses. Venous thromboembolism prophylaxis should be considered in high-risk pediatric patients with IBD, with further study needed.

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LOUISIANA POSTER FINALIST - CLINICAL VIGNETTE Nkemdi Agwaramgbo

HIV Associated Arthropathy in a 33-year-old African-American Man

Title

HIV Associated Arthropathy in a 33-year-old African-American Man

Authors

Agwaramgbo, Nkemdi MS, Crook, Errol M.D., Hundley, T.J. M.D.

Introduction

One underreported finding in patients with human immunodeficiency virus (HIV) are the associated arthropathies including seronegative spondyloarthropathies (SPA), rheumatoid arthritis (RA), painful articular syndrome, and HIV-associated arthropathy. This case explores the clinical approach used to diagnose HIV-associated arthropathy, an articular syndrome common in sub-Saharan-Africa, but considered rare in the United States, especially in an antiretroviral era.

Case Presentation

Our patient is a 33-year-old African-American male with a four-year history of HIV. He presented to the emergency department after a month of worsening, painful bilateral upper extremity arthralgia that involved his distal-interphalangeal joint (DIP's), wrist, elbows, and shoulders. These were accompanied by unilateral joint pain in his left knee and left talocrural joint. These symptoms inhibited him from raising his arms, opening bottles of water, and ambulating for over a month. His arthralgias were complicated by a four-month history of draining hidradenitis in his groin and buttocks at which point he revealed that he had discontinued his highly active antiretroviral therapy (HAART) for two years. Complete metabolic panel, complete blood count, and other blood work revealed a CD4 count above 400 and an erythrocyte sedimentation rate of 114 Syphilis, gonorrhea, chlamydia, rheumatoid factor, HLA-B27, antinuclear antibody, anti-cyclic citrullinated peptides, and hepatitis panel were negative, excluding all but seronegative origins of his articular syndrome. Unfortunately, the patient did not have enough synovial fluid collection in any joint for an arthrocentesis. The clinical picture began to guide our diagnosis. The lack of mucocutaneous involvement and extensive articular involvement made psoriatic and reactive arthritis less likely. The extensive involvement, lack of systemic symptoms, and lack of synovial fluid development after a month of symptoms made septic arthritis from his hidradenitis an unlikely etiology. Finally, painful articular syndrome

typically lasts no longer than 48 hours and tends to spare the upper extremities. Our workup left the team with HIV-associated arthropathy as the likely diagnosis and he was treated with high dose non-steroidal anti-inflammatory drugs (NSAIDs), which provided symptomatic relief. He was discharged home and restarted on HAART. Follow up contact revealed that his symptoms resolved after HARRT initiation, a key feature of the diagnosis.

Discussion

HIV-associated arthropathy is a diagnosis of exclusion and is often associated with HIV serologies seen in sub-Saharan Africa. However, this disease may be underreported and underdiagnosed in the United States because it is a self-limited syndrome that classically recedes after antiretroviral treatment. It has three variants—a symmetric arthralgia that is reminiscent of rheumatoid arthritis, a unilateral, oligoarthralgia with classical knee involvement, and a mixed presentation. The average age of presentation is 35 with a male predominance. The arthralgias progress in severity, peaking anywhere between weeks three and six of onset. Fortunately, it is a self-limited inflammatory process that rarely causes erosive joint damage. It is important to consider all articular syndromes in the setting of HIV patients with arthralgia as many of them are clinical diagnoses with varying standards of management. HIV-associated arthropathy, however, is adequately managed by NSAIDS and HAART, and a misdiagnosis can result in unnecessary medications and mismanagement.

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LOUISIANA POSTER FINALIST - CLINICAL VIGNETTE Kyle Boudreaux

Clinical consequences of ZRSR2 Spliceosome mutation in a young adult

Title

Clinical consequences of ZRSR2 Spliceosome mutation in a young adult

Authors

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Introduction

Alternative splicing is an epigenetic mechanism used by the human immune system in the development and function of antigen specific lymphocytes [1]. One such is the zinc-finger-RNA-binding-motif-and-serine/arginine-rich-2 (ZRSR2), which is clinically implicated in myelodysplastic syndrome and leukemia [2]. We present a case report of a young male with myriad autoimmune conditions and adenocarcinoma of the colon in the setting of ZRSR2 mutation.

Case Presentation

A twenty-eight-year-old male with common-variable-immunodeficiency-disease, atopic dermatitis, autoimmune-gastroenteropathy, inflammatory-polyarthropathy, and family history of lynch syndrome admitted to our hospital for acute flare of autoimmune enteropathy secondary to subtherapeutic tacrolimus levels. He initially developed pancytopenia at the age of twenty-two, requiring >60 pRBC transfusions in a 4-month period. Workup for HIV, hepatitis, cytomegalovirus, human-herpesvirus 6, parvovirus was negative. PTT, INR, d-dimer, ferritin, iron profile, ANA screen were unremarkable. Direct, indirect, and super-combs antibodies were undetectable. Chromosomal study for fanconi related chromosomal breakage and telomerase gene panel were negative. Flow cytometry did not reveal an abnormal clone. Bone marrow biopsy showed markedly hypocellular marrow with reduced trilineage hematopoiesis and 1% blasts with normal cytogenetics, immunohistochemistry, FISH, and negative for myelodysplastic

syndrome and PNH. Cincinnati inherited children's BMT panel was negative. Diagnosed as aplastic anemia, he was initially treated with anti-thymocyte globulin, cyclosporine, and prednisone, after which he developed cyclosporine induced nephropathy. He was initiated on tacrolimus and eltrombopag and could not find a suitable donor for stem-cell transplantation. At 26 years, after undergoing screening colonoscopy as a carrier of lynch syndrome, he was diagnosed with adenocarcinoma of the splenic flexure of the colon. Immunohistochemistry was positive for MLH1, but the confirmatory genetic testing for Lynch syndrome was negative. He underwent total proctocolectomy and ileostomy and is currently in remission. Due to myriad conditions at an early age, we performed next-generation sequencing of bone marrow, which revealed a germline homozygous ZRSR2 mutation.

Discussion

RNA splicing, mediated by spliceosomes like ZRSR2 plays an important role in altering biologic functions of immune proteins, which impact the host's immune response [1]. ZRSR2 mutations are more common in males as it's an X-linked gene [2]. They are reported in 4.3% myelodysplastic syndrome, 1.5% acute myeloid leukemia, chronic myelomonocytic leukemia, and chronic lymphocytic leukemia [3]. According to American Association of Cancer Research (AACR) GENIE Consortium, 0.87% of all cancers and around 35 cases of colon cancer associated with this mutation are reported [4]. Our patient not only has several autoimmune diseases, which could be a result of immune dysregulation secondary to spliceosome mutation, but also was diagnosed with adenocarcinoma of the colon, negative for lynch syndrome despite a family history. This strongly suggests the potential role of ZRSR2 mutation in hematological disorders and malignancy. Currently splicing modulator compounds, such as sudemycin and in-trial compound H3B-8800 are being studied. Understanding the role of genetic landscape in primary bone marrow failure and cancer, will help determine new pathophysiological mechanisms to the disease, develop novel molecular targets, and open new avenues for research.

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MARYLAND POSTER FINALIST - CLINICAL VIGNETTE Arthur Lyon

Unique Case of Invasive Micropapillary Carcinoma

Title

Unique Case of Invasive Micropapillary Carcinoma

Authors

Arthur Lyon, MS4, Uniformed Services University of the Health Sciences, Bethesda, MD USA; Kristen Bader, MD, Department of Medicine, SAMMC, San Antonio, TX USA

Introduction

First described by Fisher et al. in 1980, invasive micropapillary carcinoma (IMPC) of the breast is a relatively rare subtype of intraductal carcinoma accounting for

Case Presentation

67-year-old African American female with a family history of breast cancer (mother diagnosed at 50-years-old and sister) presents with 4 months of bilateral breast enlargement. On exam, patient had a left fixed breast mass of 10cm x 8cm and a right fixed breast mass 9cm x 5cm as well as right nipple induration, retraction, bloody discharge all accompanied with bilateral loss of sensation and axillary lymphadenopathy. Biopsy revealed invasive micropapillary carcinoma, immunohistochemical testing resulted in ER(-) PR(-) HER2(+) and patient was clinically staged at IIIB given supraclavicular lymph node involvement. Over the course of the next month, her left breast mass grew from 10cm to 14cm. Neoadjuvant chemotherapy (NAC) consisting of docetaxel, carboplatin, trastuzumab, and pertuzumab was initiated to decrease tumor burden. She eventually underwent a bilateral mastectomy. She was found to have 16 positive residual lymph nodes on the left side despite NAC. With the exceptionally large tumor size she underwent additional skin flap resection and reverse abdominoplasty skin closure of the wound.

Discussion

Breast cancer covers a vast spectrum of pathologic subtypes with a variety of biological behaviors. IMPC is histologically unique given its absence of fibrovascular cores and reversed polarity implied by the tumor's papillary nature. With well-defined cell polarity and tubule formation, IMPC has a well reported growth pattern involving a high degree of regional nodal

spread and a metastasis rate of up to 46-95% [5,6,7]. Having a higher metastatic rate compared to 34% observed with intraductal carcinoma, prompt diagnosis is critical. Breast tissue biopsy and identification of nodal involvement is performed for definitive diagnosis and receptor status. Lymph node involvement and lymphovascular involvement are unfavorable prognostic indictors. Patients with high mortality rates from IMPC most often have large tumor burden, more lymph node metastasis, high histological grade, and skin involvement [5]. Conclusion: While invasive micropapillary carcinoma is a rare form of intraductal breast cancer, providers should consider this diagnosis in patients presenting with a positive family history and significant tumor burden. When treated, there is a 5-year disease-free survival of 57.4% and 10-year overall survival of 48% [3]. The aggressive behavior of this subtype of breast cancer necessitates both early recognition and individualized treatment, which is based on receptor type and tumor burden. Radiation treatment and tumor size have been described as the only independent predictors of survival in patients with invasive micropapillary carcinoma [6].

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MARYLAND POSTER FINALIST - CLINICAL VIGNETTE Laura O'Keefe

Say Yes to the DRESS? A case of primary EBV infection masquerading as DRESS syndrome.

Title

Say Yes to the DRESS? A case of primary EBV infection masquerading as DRESS syndrome.

Authors

2d Lt Laura O'Keefe, Dr. Kathryn Burtson

Introduction

We present an unusual case of a patient with hepatocellular injury, peripheral eosinophilia, and recent amoxicillin use. Despite initial concern for DRESS syndrome, the patient was found to have primary EBV infection.

Case Presentation

The patient is a 64 year old woman who presented to the ED with rash, nausea, and headache after amoxicillin use, found to have hepatocellular injury and peripheral eosinophilia. She had recently undergone left total knee replacement and subsequently developed a pruritic rash around her surgical scar. She was directed to take amoxicillin by her surgeon and later noticed a red, pruritic rash on her back. She presented to the ED where it was thought that the rash around her surgical scar was due to local allergy to the wound tape. She was given dexamethasone and instructed to discontinue amoxicillin. The next day, she returned to the ED with nausea and headache. She was found to have an AST of 400 and ALT greater than 500 to as well as 12.6% peripheral eosinophils, prompting concern for DRESS syndrome in light of her recent amoxicillin use.The patient was admitted and her liver-associated enzymes continued to rise over time. She endorsed only intermittent nausea and headache. She had a faint, lacy, macular, pruritic rash across her back and chest which remained stable. DRESS was highest on the differential, which also included drug rash and other causes of hepatitis. The benign appearance of the rash prompted a dermatology consult. Biopsy demonstrated findings consistent with miliaria rubra, rather than the inflammatory pattern of cutaneous effector lymphocytes which normally characterize DRESS. Viral hepatitis serologies were negative, with normal values for ceruloplasmin, ferritin, iron, and ANA. The patient's liver function stabilized, and she was discharged with close followup. After discharge, EBV serology returned positive for primary infection. The patient was monitored as an outpatient and her liver function returned to normal within a few months.

Discussion

Drug Reaction with Eosinophilia and Systemic Symptoms is a life-threatening drug-induced hypersensitivity syndrome characterized by morbilliform eruption, marked eosinophilia, and organ system involvement. Although the patient initially appeared to fit these criteria, her rash was identified as miliaria rubra. This is a common dermatologic condition resulting from clogged apocrine ducts which affects about 30% of the population and is unrelated to a drug eruption. This left us with the task of determining other potential causes of her eosinophilia and hepatitis. The patient's serology indicated a primary Epstein-Barr virus infection. EBV is ubiquitous and can cause a variety of presentations, from the classic infectious mononucleosis to less common manifestations such as myocarditis. Several case reports describe an EBV-associated hepatitis in adults without the clang-associated symptoms such as sore throat, ranging from mild symptoms of right upper quadrant pain to ascites and pulmonary edema. Even in those severely affected, supportive care was sufficient to allow recovery in 2-6 months. As for the elevated eosinophil count, penicillins can cause asymptomatic peripheral eosinophilia outside the context of DRESS. This case demonstrates the importance of maintaining a broad differential even in seemingly obvious cases.

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MASSACHUSETTS POSTER FINALIST - CLINICAL VIGNETTE
Michael Chepanoske

Cryptococcal meningitis in a non-HIV patient with sarcoidosis and liver cirrhosis

Title

Cryptococcal meningitis in a non-HIV patient with sarcoidosis and liver cirrhosis

Authors

Michael Chepanoske - UMass Medical School, Student Kedar Mahagaokar MD - UMass Medical School, Resident Priya Sharma MD - UMass Medical School, Attending

Introduction

Cryptococcal meningitis (CM) represents a severe form of cryptococcal infection in both immunocompromised and immunocompetent hosts. An estimated 200,000 cases occur globally each year with most recent studies showing 3,400 cases annually in the US alone. Although CM has been historically defined as an HIV/AIDS-related illness, the relative incidence of CM among non-HIV infected hosts has increased in the US since the development of antiretroviral therapies. One retrospective study comparing risk factors in patients hospitalized for invasive cryptococcal disease compared to controls identified decompensated liver cirrhosis, cell-mediated immunity suppressive regimens (non-calcineurin inhibitor), and history of autoimmune disease as significant risk factors for CM. Sarcoidosis, a granulomatous disease that predominantly affects the lungs, is an autoimmune disorder with dysfunctional T-cell immunity, the primary defense for cryptococcal infections.

Case Presentation

A 64-year-old female with a history of alcoholic cirrhosis, chronic thrombocytopenia, and sarcoidosis was suddenly found to have altered mental status at home 2.5 months prior to presentation. She was initially treated for dehydration and a urinary tract infection. In the outpatient setting, she continued to have worsening mentation and failure to thrive. She also had low-grade fevers and persistent headaches not relieved by acetaminophen or ibuprofen. The condition was initially believed to be a depressive episode, and she was started on sertraline without improvement in mentation. One week prior to presentation, the patient was sent to an outside hospital for psychiatric evaluation. There she was treated for Wernicke's encephalopathy, and blood cultures were collected prior to discharge to rehab. Five days later, blood cultures were positive for Cryptococcus neoformans, and the patient was hospitalized for treatment of disseminated cryptococcal infection that was confirmed by cerebrospinal fluid

polymerase chain reaction and cryptococcal antigen on lumbar puncture. With induction therapy, her headaches and mentation improved, but she was recently re-hospitalized for persistent disseminated cryptococcal infection following outpatient consolidation therapy.

Discussion

This report describes the diagnosis of CM roughly two months after onset of symptoms in an HIV-seronegative patient with a history of liver cirrhosis and sarcoidosis, conditions that have been shown to be associated with disseminated cryptococcal infections. Mortality remains high in CM due to its non-specific clinical features and delayed diagnosis in patients with no obvious source of immunosuppression, and early recognition and treatment of CM improves both morbidity and mortality associated with the disease. Although CM is rare in HIV-negative patients, prior case reports show a clear association between both sarcoidosis and liver cirrhosis with CM. Misdiagnosis of CM as being neurosarcoidosis, hepatic encephalopathy, or in our case a mood disorder, still occurs. This leads to a delay of both diagnosis and treatment, worsening patient outcomes. Therefore, it is important for the clinician to have a high index of suspicion for CM in patients with sarcoidosis or cirrhosis presenting with altered mental status, even if they are HIV-negative.

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MICHIGAN POSTER FINALIST - CLINICAL VIGNETTE Alexis Faber

The Power of the Medical History

Title

The Power of the Medical History

Authors

Alexis Faber, Yousef Bader, MD., Mohamed Ahmed El-Ghoroury, MD.

Introduction

The learning objectives for this case are as follows: recognize the presentation of acute adrenal insufficiency, review the treatment of acute adrenal insufficiency, and affirm the importance of complete medical history-taking

Case Presentation

64-year-old male presented to the emergency department from his home via ambulance for altered mental status. The patient was unable to answer questions or provide history. The electronic medical record did not list any emergency contacts or medical history. In the emergency department, he was found to be hypotensive and septic. Nephrology was consulted for acute kidney injury. The patient was admitted for sepsis management. On the second day of admission, the patient's brother called the hospital and verbally informed the primary internal medicine team that the patient is a veteran and regularly follows with the local Veterans Affairs (VA) hospital. Initially his blood pressure was controlled with intravenous fluids, but on day three of admission he began to have persistent hypotension despite aggressive intravenous fluid therapy. The patient was transferred to the medical intensive care unit where he was intubated and started on four pressor medications to maintain adequate blood pressure. At this point, the medical student with the nephrology service reached out to the local VA hospital for further information and learned the patient had a known history of panhypopituitarism, secondary to surgical removal of a macroadenoma in 2004. Per the VA hospital records, the patient takes daily hydrocortisone, DDAVP, levothyroxine, and testosterone. The nephrology service suspected acute adrenal insufficiency; hydrocortisone was ordered and an immediate draw of the serum cortisol level revealed it to be low.

Discussion

Acute adrenal insufficiency, also known as adrenal crisis, is a life-threatening medical emergency that requires prompt recognition and treatment. This is seen most commonly in

patients with primary adrenal insufficiency, but may also be seen in patients with secondary or tertiary adrenal insufficiency upon acute withdrawal from chronic exogenous glucocorticoids, as was the case with this patient. Adrenal crisis presents with severe hypotension unresponsive to intravenous fluids; intravenous glucocorticoids are a necessary part of treatment. A key aspect of this case was the importance of a full medical history, including both family input and outside records. Additionally, this case demonstrates the potential benefit of a national electronic medical record.

MICHIGAN POSTER FINALIST - CLINICAL VIGNETTE Tarin Phillips

PCP pneumonia in non-HIV immunocompromised patients: A call for improved prophylaxis

Title

PCP pneumonia in non-HIV immunocompromised patients: A call for improved prophylaxis

Authors

Tarin Phillips, Kalyani Movva, Susan Stevens

Introduction

Pneumocystis jiroveci is known for its propensity to infect immunocompromised hosts. It's growing incidence in non-HIV immunocompromised patients is likely due to the increasing use of immunosuppressive agents (Sepkowitz). These medications, especially in combination, warrant a risk-benefit analysis for prophylaxis (Calero; Baden). In this population, the guidelines for prophylaxis target cancer patients and transplant recipients but are ambiguous for those requiring immunosuppressive therapy (Baden). In a recent study, greater than 90% of non-HIV patients did not receive prophylaxis one month prior to their infection despite guideline-directed indications (Dunbar). This demonstrates a need for increased awareness of the indications for prophylaxis, especially considering the increase in morbidity and mortality in these patients.

Case Presentation

A 45 yo male with active multiple myeloma presents with generalized weakness, cough, fever, and dyspnea one week following discharge for MSSA bacteremia likely due to infected surgical hardware from a laminectomy. He was on ceftriaxone, rifampin, and dexamethasone taper, completed radiation therapy, and scheduled to initiate chemotherapy. The chest CT during the recent admission showed no signs of acute pulmonary process. In the emergency room, the patient was hypoxic to 87% on room air, febrile, and tachycardic. He was acutely ill with diminished lung sounds at the bases bilaterally, and bibasilar crackles. CT chest and abdomen showed mild increasing soft tissue thickening along the lateral margin of T5 near the surgical hardware, a new basilar opacity in the right lower lobe greater than left, and scattered subcentimeter nodules in the lower lungs. The patient remained tachycardic, tachypneic with worsening non-productive cough, and periodic fevers. A follow up chest CT showed mild to moderate diffuse pneumonia. LDH and beta-glucan were elevated; prompting bronchoscopy evaluation. Bronchoalveolar lavage was positive for pneumocystis jiroveci PCR. The patient was

started on clindamycin and primaquine for PCP pneumonia due to his underlying myeloma nephropathy.

Discussion

This case demonstrates the complicated decision-making process in regards to PCP prophylaxis and the acuity of presentation in non-HIV immunocompromised patients. This raises the question if this patient should have received prophylaxis for PCP based on his immunocompromised state, the dosage and duration of steroid exposure. In hindsight, this patient would have benefited from prophylaxis but his clinical course displayed no clear indication. It is important to recognize the difference in PCP presentation between HIV and non-HIV patients. Non-HIV PCP typically have a shorter onset with rapid progression, severe hypoxemia, shock, require intensive care, mechanical ventilation with longer duration until appropriate therapy initiated and greater risk of mortality (Roux; Rego). HIV patients typically have a more insidious presentation (Rego). Clindamycin and Primaquine, a second-line therapy, were initiated to avoid using trimethoprim-sulfamethoxazole due to his myeloma nephropathy. Although, it is reasonable to consider using trimethoprim-sulfamethoxazole in a severe case of PCP in patients with chronic kidney disease because of the high likelihood of kidney recovery (Ye). An autoimmune/ inflammatory condition risk stratification has been established and should be utilized for improved prophylaxis evaluation (Fillatre). Increasing awareness is necessary to halt the growing incidence of PCP pneumonia in this population.

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MICHIGAN POSTER FINALIST - CLINICAL VIGNETTE Jessica Ziccarello

The Importance of Patient Advocacy in Foreign Body Identification and Management: A Case Report

Title

The Importance of Patient Advocacy in Foreign Body Identification and Management: A Case Report

Authors

Jessica Ziccarello BS, Laura Bauler PhD, Joshua Mastenbrook MD

Introduction

Foreign body ingestion, while not uncommonly seen in psychiatric patients, may present challenges for physicians due to the potential for unreliable histories and dependence on imaging to locate the object. Irregular or sharp objects, such as silverware or razor blades, are more likely to be ingested by psychiatric patients or those who are incarcerated [1], which can lead to dangerous complications. While plain radiography is the standard first-line imaging modality, small or radiolucent objects can easily elude detection. Subspecialty consultants may miss subtle signs that a foreign body is present and make recommendations that contribute to delays in identification. In situations where the history does not match the imaging and/or consultant opinion, physicians should advocate for the best interest of their patients.

Case Presentation

A 22-year-old female with a history of bipolar disorder, borderline personality disorder, and multiple foreign body ingestions with esophagogastroduodenoscopies (EGDs), presented to the ED from a local psychiatric hospital with constant, 10/10 left-sided throat pain after ingesting the stem of her eyeglasses several hours earlier. On evaluation, the patient had a normal lung and abdominal exam, her posterior pharynx had no erythema, swelling, or bleeding, and her neck was supple. Plain radiographs of her neck and abdomen revealed an 8-9cm linear foreign body in the left proximal esophagus. The Gastroenterology service performed an emergent EGD with moderate sedation, but when no foreign body was found, they suggested that the object may have passed naturally and recommended discharge.

When the patient regained consciousness, she reported continued left-sided throat pain and was adamant that the object was still present. Rather than reassure her that the EGD was

negative and she could be safely discharged, the attending physician used an ultrasound at the bedside to re-examine her neck. The foreign object was once again identified on the left. Computed tomography of the soft tissue of the neck revealed that the foreign body had penetrated the esophagus around C3-C4, and was resting at the confluence of the internal jugular vein and brachiocephalic vein, just anterior to the carotid sheath; no definite vascular injury was seen. The patient was transferred to a university hospital for definitive management and removal of the object.

Discussion

In the case presented here, advocacy for the patient even in the face of more conservative recommendations from the consulting specialist was critical in ensuring appropriate management and ultimately, the removal of the object. Placing more emphasis on the patient's account of their foreign body ingestion and the corroborating physical exam findings cannot only lead to better patient management, but will build trust between patients and providers within the medical system. While subspecialty recommendations are invaluable, the consulting physician may not have all the information or the ability to immediately evaluate the patient in person. Thus, the clinician who has followed the case from the beginning is in a unique position to advocate for their patient and the interventions they believe will be most beneficial.

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MINNESOTA POSTER FINALIST - CLINICAL VIGNETTE Grayson Ashby

ANCA-Associated Vasculitis with Oropharyngeal and Periorbital Lesions: Underlying Disease or Superimposed Infection?

Title

ANCA-Associated Vasculitis with Oropharyngeal and Periorbital Lesions: Underlying Disease or Superimposed Infection?

Authors

Grayson Ashby, BS and Diego Suarez, MD

Introduction

Pulmorenal syndrome commonly presents with diffuse alveolar hemorrhage and glomerulonephritis (1) and is typically caused by autoimmune processes like anti-neutrophil cytoplasmic antibody (ANCA) associated vasculitides (AAVs), anti-glomerular basement membrane disease, and systemic lupus erythematosus, though toxic ingestions and infections have also been reported causes (2, 3). Depending on the underlying etiology, pulmorenal syndrome may present with other systemic findings, and here, we present a previously undifferentiated pulmorenal syndrome with oropharyngeal and periorbital manifestations that led to a management dilemma.

Case Presentation

A 72-year-old female never-smoker was admitted for progressive dyspnea, pleuritic chest pain, and non-productive cough after failing outpatient treatment for presumed community-acquired pneumonia based on radiographic findings. On arrival, she was afebrile, hemodynamically stable, and breathing comfortably on room air. Physical exam was remarkable for pulmonary crackles and a clean-based ulcer on the lateral tongue border. Initial labs showed neutrophil-predominant leukocytosis, normocytic anemia, elevated inflammatory markers, and creatinine approximately four times her baseline. Urinalysis showed proteinuria and hematuria without dysmorphic red blood cells or casts. CT chest showed infiltrative mass-like consolidations in bilateral lung bases with innumerable peri-bronchovascular nodules. Given the multiorgan involvement, rheumatological evaluation was completed and showed myeloperoxidase and perinuclear-ANCA positivity with mildly elevated rheumatoid factor and antinuclear antibodies. Diagnosis of AAV was confirmed with renal biopsy, showing pauci-immune necrotizing and crescentic glomerulonephtiris with necrotizing arteritis, and broncheoalveolar lavage, showing

hemosiderin-laden macrophages without signs of infection or frank bleeding. Prior to initiating immunosuppression, an infectious work up was completed, including hepatitis panel, fungal mycoses, HIV, CMV, EBV, sputum and urine culture, and quantiferon assay. She was started on pulse-dose steroids. Despite initiating immunosuppression, her oral ulcers worsened, spreading beyond her tongue to other areas of the oropharynx. She also developed nasopharyngeal crusting with dried blood seen in both nasal cavities on flexible laryngoscopy. Concomitantly, she developed painless, erythematous periorbital vesicles with edema and mattering around the eyelids. This progression despite treatment raised concern for an underlying infection, especially with forthcoming chronic immunosuppression. These lesions were cultured and biopsied, and broad spectrum antibiotics were started. Tongue histopathology was consistent with AAV, showing ulceration, necrosis, and inflammation, but no definitive stigmata of vasculitis were present. Cutaneous biopsy showed neutrophilic inflammation and small-vessel fibrinoid necrosis, further solidifying the diagnosis of AAV. With infection ruled out, the patient was discharged without antibiotics on an immunossuppresive regimen and eventually transitioned to rituximab.

Discussion

The pathophysiologic mechanism of AAVs involves autoantibody-activated neutrophils causing small-vessel inflammation in a variety of organ systems. Although initial management for autoimmune pulmorenal syndrome is similar regardless of etiology, AAVs are likely to recur, thus requiring chronic immunosuppression with rituximab as the current preferred therapy (4). Cutaneous manifestations are among the least likely (5), and unfortunately, they may appear similar to infection or become secondarily infected, necessitating treatment prior to starting immunosuppression. In this case, ruling out infection was particularly important given the potential sight risk with periorbital involvement and the increased risk of infection with oropharyngeal involvement.

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MINNESOTA POSTER FINALIST - CLINICAL VIGNETTE Rob L Shaver

A Difficult Diagnosis Masquerading Clinically and Histologically as Histiocytoid Sweet Syndrome

Title

A Difficult Diagnosis Masquerading Clinically and Histologically as Histiocytoid Sweet Syndrome

Authors

Rob Shaver, BS Adarsh Ravishankar, BS Justin Peltola, MD Hector Mesa, MD Erick Jacobson-Dunlop, MD Sigrid Collier, MD, MPH Noah Goldfarb, MD

Introduction

The 'histiocytoid' sweet syndrome (HSS) subvariant was first described in 2005 and continues to be studied.1 Upon pathologic review, the infiltrate in HSS patients is mainly comprised of immature myeloid cells which resemble histiocytes and are associated with a neutrophilic infiltrate.1 This diagnosis, however, is rare and other diagnoses should be considered. Here, we present a case of a 61-year-old male with clinical and histological similarities to histiocytoid sweet syndrome who was ultimately found to have a separate diagnosis.

Case Presentation

61-year-old male with no significant medical history presented for one-year history of an intermittent pruritic rash affecting the chest. The eruption occurred four times over the prior year with spontaneous resolution. Two months prior to presentation, the eruption returned, spreading throughout the abdomen, back, bilateral upper extremities, neck and cheeks. Exam was notable for widespread, light pink, edematous papules and plaques in the involved areas. In the following months, multiple biopsies demonstrated a dense superficial and deep perivascular mononuclear cell infiltrate involving adnexal structures, with a predominance of CD4+ cells. ANA was negative. Six months later, the patient returned noting increased itching and crusting of lesions on his face, chills, and low-grade fevers. Laboratory evaluation was notable for a leukocytosis of 18,000 WBC/mL with myeloblasts on the differential. Bone marrow biopsy was consistent with acute myelomonocytic leukemia (AMML). Repeat skin biopsies demonstrated similar histologic findings as before, but the mononuclear cell infiltrate was found to be CD4+/CD34-/CD123+/CD56-/lysozyme+/MPO-, consistent with a mature plasmacytoid dendritic cell proliferation (MPDCP). The patient's skin began clearing soon after induction chemotherapy, but a few weeks later, after being treated with filgrastim for

neutropenia, he developed new indurated purpuric plaques on the trunk. Biopsy demonstrated drenching dermal edema, interstitial and superficial and deep infiltrate with histiocytoid appearing cells concerning for HSS. However, markers were found to be CD4+/CD34-/CD123+/CD56-/lysozyme+/MPO-, again consistent with MPDCP.

Discussion

Mature plasmacytoid dendritic cell neoplasm (MPDCN) is a condition associated with myeloid neoplasms, most commonly chronic myelomonocytic leukemia. It is less commonly associated with acute leukemia or myelodysplasia with monocytic differentiation.2 MPDCN typically presents as an erythematous maculopapular eruption with pruritus and lymphadenopathy.2 This case demonstrates that MPDCP should be considered in the differential diagnosis of eruptions that clinically and histologically mimic HSS but are MPO-negative. MPDCP markers may be useful in eruptions with superficial and deep CD4+ mononuclear cell infiltrate.

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MISSISSIPPI POSTER FINALIST - CLINICAL VIGNETTE Aalaap Desai

Cardiac Angiosarcoma with Metastasis to the Brain: A Rare Case of a Ruthless Presentation

Title

Cardiac Angiosarcoma with Metastasis to the Brain: A Rare Case of a Ruthless Presentation

Authors

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Introduction

With an incidence of 0.0001% in autopsy studies, primary cardiac angiosarcoma is amongst the rarest and most fatal subtypes of malignancies. Patients are often asymptomatic in initial stages. By the time symptoms develop, the disease is often advanced leaving few, if any, treatment options. The presented case discusses a young patient with the most commonplace of symptoms, shortness of breath and headache, leading to an inevitable diagnosis of a rare primary cardiac malignancy.

Case Presentation

A previously healthy 26-year-old Caucasian female presented with new-onset chest pain and worsening dyspnea for one month. Imaging showed a large pericardial and bilateral pleural effusions requiring pericardiocentesis and bronchoscopy. The patient then left against medical advice (AMA) preventing additional work-up. She returned 1 month later with interval worsening of dyspnea and subsequently underwent transbronchial cryobiopsy which showed eosinophilic pneumonia. The patient was treated with pulse-dose steroids prior to leaving AMA again. She returned 6 weeks later with worsening dyspnea for 3 weeks associated with intermittent hemoptysis as well as a 5-day history of new-onset severe headaches. She was notably hypoxemic requiring supplemental oxygen via nasal canula as well as anemic requiring transfusion. Repeat imaging showed significant interval worsening of cannon-ball lung lesions and a new large mediastinal mass effacing the right atrium. CT and MRI brain showed multiple hemorrhagic intracranial lesions with surrounding vasogenic edema. Due to the rapid disease progression, a comprehensive infectious work-up ensued including fungal, parasitic, and

bacterial serologies. Other differentials included malignancy and vasculitis. A cardiac MRI with anesthesia was obtained with plans for biopsy and tissue diagnosis. Shortly after imaging, patient was found to be aphasic with right-sided hemiparesis. Emergent CT head revealed a large parenchymal hemorrhage of the left temporal lobe. She had a decompressive craniectomy and pathology showed angiosarcoma supported by immunohistochemistry revealing strong positive reactivity in the ERG, CD31, and CD34 studies for endothelial cells. Patient remained intubated in the neurosurgical intensive care unit but unfortunately her condition continued to deteriorate. Given her instability and grim prognosis, few palliative measures were available and her family decided to withdraw care with the patient passing shortly after.

Discussion

In a young previously healthy patient like this with relatively few risk factors and lack of constitutional symptoms, malignancy is often not on the forefront of many clinicians' minds. The rarity of primary cardiac malignancy and its predominance in young male patients make this diagnosis challenging. In this patient, her initial relative stability in combination with the bronchoscopic findings of eosinophilic pneumonia may have served as red herrings. In presenting this case, we hope that future clinicians will consider aggressive primary malignancies such as metastatic cardiac angiosarcoma in patients with similar presentations to improve mortality with earlier intervention.

MISSISSIPPI POSTER FINALIST - CLINICAL VIGNETTE Mark Lewis

Interesting Presentation of Pituitary Macroadenoma

Title

Interesting Presentation of Pituitary Macroadenoma

Authors

Authors: Mark B. Lewis1, Priya Patel M.D.2, Savannah Duckworth M.D.2 Author Affiliation: School of Medicine at University of Mississippi Medical Center1, Department of Medicine at UMMC2

Introduction

Pituitary tumors present with a diverse symptomatology depending on whether they secrete hormones or cause mass effect. However, 12-37% of pituitary tumors are non-functional/silent and present asymptomatically or with minor complaints, which makes this a particularly challenging diagnosis. Herein, we describe a case of a hormonally inactive pituitary tumor with anatomical compression.

Case Presentation

A 70 year old Punjabi male with type 2 diabetes, gastroesophageal reflux disease, and hypertension presented with altered mental status and fatigue. He had been experiencing progressive memory decline and reduced mobility for the past three weeks. He was recently hospitalized for five days and treated for community acquired pneumonia. During this recent hospitalization, he was noted to be hyponatremic at 127 mmol/L. At our hospital, he was found to have exertional dyspnea and nausea. On exam, his temperature was 97.1, heart rate 88, respiratory rate 22, blood pressure 106/83, and oxygen saturation 100% on room air. He was euvolemic on exam, and the rest of the physical exam was benign. Initially, our working diagnosis was syndrome of inappropriate antidiuretic hormone secretion (SIADH) secondary to community acquired pneumonia. He was then started on antibiotics. However, based on a normal white blood cell count, normal chest x-ray, negative legionella urine antigen, unremarkable physical exam, and no complaints of cough, antibiotics were discontinued. Initial labs revealed a low serum sodium at 126 mmol/L, high urine sodium at 77 mmol/L, low serum osmolarity at 267 mOsm/kg, and high urine osmolarity at 448 mOsm/kg. Patient showed no improvement in serum sodium after fluid restriction. Further workup revealed a low cortisol level of 0.33 mcg/dL, low ACTH of 5.9 pg/mL, normal TSH of 1.26 mcIU/mL, and low free T4 of 0.447 ng/dL. He was started on stress dose hydrocortisone and levothyroxine for central adrenal insufficiency and central hypothyroidism, respectively. Additional labs revealed low LH,

FSH, and testosterone, indicating central hypogonadism. MRI showed a 1.9 cm pituitary mass with superior displacement of the optic chiasm. Ophthalmology evaluation revealed only bilateral cataracts. Neurosurgery performed a transsphenoidal pituitary resection without complications. The patient had symptomatic and clinical improvement post-surgery.

Discussion

Pituitary tumors present in various ways, and our case demonstrates that a thorough evaluation of nonspecific symptoms may reveal an unexpected diagnosis. SIADH is a diagnosis of exclusion, so it is important to explore other etiologies such as thyroid dysfunction, adrenal insufficiency, or primary polydipsia. Additionally, early identification of pituitary tumors can improve outcome due to their slow-growing nature. Therefore, this is a diagnosis that should not be missed. This case will change our practice in terms of considering uncommon diagnoses like our patient's nonfunctioning pituitary tumor.

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MISSISSIPPI POSTER FINALIST - CLINICAL VIGNETTE Mark Lewis

Chronic Thromboembolic Pulmonary Hypertension in the Setting of Essential Thrombocythemia

Title

Chronic Thromboembolic Pulmonary Hypertension in the Setting of Essential Thrombocythemia

Authors

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Introduction

Group IV Pulmonary Hypertension refers to thromboembolic obstruction of the pulmonary arteries which can lead to progressive right heart failure and death without early diagnosis and intervention. Here, we report a case of Chronic Thromboembolic Pulmonary Hypertension (CTEPH) with resultant right ventricular failure in the setting of Essential Thrombocythemia (ET).

Case Presentation

A 36 year old African-American female with asthma presented with a chief complaint of difficulty breathing. She reported gradual worsening of symptoms over 1 year, now with dyspnea upon minimal exertion. Additional symptoms included nightly awakenings with a feeling of suffocation, worsening bilateral leg swelling, orthopnea, blurred vision, and exertional chest tightness. Physical exam was remarkable for pitting edema to bilateral mid-thighs and elevated jugular venous distension to the earlobe while sitting at ninety degrees. Lungs were clear to auscultation bilaterally. Labs were notable for a platelet count of 620,000 per mcL, pro-brain natriuretic peptide of 2268 pg/mL, and D-dimer of 1307 ng/mL. She was admitted due to concern for acute onset heart failure versus pulmonary embolism. Electrocardiogram revealed right axis deviation and right ventricular hypertrophy. Transthoracic echocardiogram showed a dilated main pulmonary artery as well as a severely enlarged right ventricle and right atrium, concerning for right ventricular failure in the setting of pulmonary hypertension. Estimated right ventricular systolic pressure was elevated at 65 mmHg, and left ventricular ejection fraction was 60%. Computed tomography with pulmonary embolism protocol revealed diffuse mosaic attenuation, multiple acute and chronic pulmonary emboli, interventricular septal flattening, and a 1.8 centimeter right ventricular thrombus. She was started on warfarin with heparin bridge for treatment of right ventricular thrombus and pulmonary emboli. Right ventricular systolic heart failure was treated with digoxin and furosemide which alleviated her

symptoms. It was decided to postpone right heart catheterization due to risk of thrombus dislodgement. She later tested positive for JAK2 V617F mutation, leading to a diagnosis of ET. Hydroxyurea therapy was initiated for treatment of ET. Currently, she is being evaluated for definitive surgical management with pulmonary thromboendarterectomy.

Discussion

CTEPH is a rare cause of pulmonary hypertension with an incidence of 3-30 per million, and it is associated with high morbidity and mortality. Those with other chronic myeloproliferative diseases (CMPD) like ET are at increased risk of thrombosis which can lead to CTEPH. Early detection and intervention are crucial since patients can be surgically cured with pulmonary thromboendarterectomy. Identifying CMPD is equally necessary, as these disorders allow for alternative treatment options. A high level of suspicion is important, as 25% of patients have no known history of a defined thromboembolic event. This case demonstrates that CTEPH should be considered in all patients with unexplained exertional dyspnea with or without prior history of a thromboembolic event.

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MISSOURI POSTER FINALIST - CLINICAL VIGNETTE Neha Bang

A novel approach to the management of acute limb ischemia in a 45-year-old female with COVID-19

Title

A novel approach to the management of acute limb ischemia in a 45-year-old female with COVID-19

Authors

Neha Bang, MS-4; Darwin Jeyaraj, MD

Introduction

Coronavirus disease of 2019 (COVID-19) is a condition often characterized by respiratory and gastrointestinal symptoms. However, COVID-19 has also been infrequently associated with acute limb ischemia, which makes it challenging to diagnose and manage. This case illustrates that COVID-19 may be associated with thrombosis and vasospasm in certain cases. Therapy with vasodilators may benefit patients presenting with this disease.

Case Presentation

A 45-year-old woman presented to the emergency department for numbness and pain in her left upper extremity, as well as cyanosis in her left fingertips. Her husband tested positive for COVID-19 a few weeks before the patient presented for care. Eleven days before her presentation, the patient experienced congestion and upper respiratory symptoms. However, she denied these symptoms on presentation. Physical exam revealed the presence of a left radial pulse and the absence of a left ulnar pulse. The left third, fourth, and fifth digits were dusky. Duplex ultrasound of the left upper extremity revealed thrombosis of the left ulnar artery. The patient tested positive for COVID-19 and was admitted for acute limb ischemia. She underwent emergent revascularization involving repeated courses of thrombectomy and administration of tPA in the arterial system of the left upper extremity. On the third day of admission, the patient was found to have had extensive thrombosis extending from the left axillary artery down the rest of the left upper extremity. The use of vasodilators, including papaverine, nitroglycerin, and verapamil, led to improved flow to the left hand. The patient noted reduced pain, and was discharged from the hospital with anticoagulant therapy.

Discussion

Limited data are available regarding the management of acute limb ischemia associated with COVID-19. Most cases of acute limb ischemia are managed with thrombectomy and thrombolytic therapy. This case is unique in that it involves using aggressive vasodilator therapy to successfully restore perfusion in acute limb ischemia associated with an infectious etiology. Understanding this atypical form of acute limb ischemia can possibly lead to improvements in the treatment of this condition.

MISSOURI POSTER FINALIST - CLINICAL VIGNETTE Theja Bhamidipati

Drug Induced Bullous Pemphigoid Masked Behind Complex Medication Interaction

Title

Drug Induced Bullous Pemphigoid Masked Behind Complex Medication Interaction

Authors

Bhamidipati T Osterholt M

Introduction

Bullous pemphigoid (BP) is an acquired autoimmune disease characterized by subepidermal blistering. The pathophysiology of the disease stems from dysregulated T Cells and the formation of antibodies against hemidesmosomes resulting in blisters (Miyamoto et al., 2019). Recent literature has shown that the use of certain medications can predispose genetically inclined individuals to develop this autoimmune response. While no specific biomarkers have been found to distinguish drug-induced BP from the classic variant, the treatment of the former relies on cessation of the target medication (Miyamoto et al., 2019).

Case Presentation

A 70 year old male with a history of Type II Diabetes Mellitus (DM) and polysubstance abuse presented with a long-standing history of bilateral lower extremity ulcers secondary to his poorly controlled DM. Five months prior to presentation, the patient was receiving standard wound care at a long term care facility. When these wounds became refractory to treatment, the patient was admitted to a county hospital. During this hospital course, the patient received vancomycin, cefepime, and fluconazole with wound debridement. Incidental lab work at this time showed severe hyponatremia of 124mEq/L (normal range 135-145mEq/L). To correct the hyponatremia, the patient received fluids, hypertonic saline, and demeclocycline. After correction of sodium to 134mEq/L, the patient was discharged. Approximately four weeks after discharge the patient presented to a different county hospital with 8mm erupting blisters covering nearly 50% of total body surface area with sparing of the mucus membranes, genitals, palms, and perianal region. Punch biopsy of the lesions showed markers consistent with BP with positive immunofluorescence. Standardized protocols were initiated with normal saline and IV prednisone and mycophenolate. While his pruritus and pain subsided, the blistering persisted with novel blisters on his palms. One week later, the decision was made to begin Rituximab. The patient received four infusions of Rituximab over the next month.

Unfortunately, the patient reported increased pain, nausea, and re-blistering of the wounds. Due to the refractory nature of the disease, plasmapheresis was considered as a last line agent. In preparation for this treatment, lab work was drawn and showed eosinophilia of 18% (normal: 6%) raising the suspicion for an immune reaction. It was at this time that a medication review was performed and Demeclocycline and Pramiprexole were identified as potential culprits for drug eruption. The patient's Pramipexole use was not fully understood, but was initiated months prior to presentation. Discontinuation of these medications led to a decrease in eosinophilia to 8% and improved wound healing. A clinical diagnosis at this time was made of Drug-Induced Bullous Pemphigoid secondary to Pramipexole and Demeclocycline. The patient was monitored for the following week and was discharged home.

Discussion

This case identifies an important distinction between classical variant BP and drug induced BP. The clinical management is vastly different and incorrect management of drug induced BP can, in fact, exacerbate the blistering. The larger implications of this case highlights the effectiveness of appropriate medication reconciliation especially in complex patients with prolonged hospital stays.

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MISSOURI POSTER FINALIST - CLINICAL VIGNETTE Frederick V Moh

Proof in the Peripheral Smear: Severe Vitamin B12 Deficiency Mimicking Thrombotic Thrombocytopenic Purpura

Title

Proof in the Peripheral Smear: Severe Vitamin B12 Deficiency Mimicking Thrombotic Thrombocytopenic Purpura

Authors

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Introduction

Thrombotic thrombocytopenic purpura (TTP) is a hematologic emergency where timely plasmapheresis reduces mortality. There are a few cases where benign etiologies mimic TTP and patients may receive unnecessary plasma exchange. Interdisciplinary decision-making is invaluable to avoid expenses and complications of more invasive treatments.

Case Presentation

A 38-year-old male with self-reported history of asthma presented with generalized weakness and syncope. He endorsed 2-week of bilateral leg pain with numbness, loss of taste, and nausea. Vital signs were remarkable for tachycardia in 110s and hypotension at 101/52. Labs showed hemoglobin 3.3, WBC 3.6, platelet 83, MCV 93.9, reticulocyte 1.1%, total bilirubin 1.4, haptoglobin 2000, however value was drawn near the time of administration of intramuscular vitamin B12. Peripheral blood smear showed anisocytosis, macrocytes, schistocytes, and hypersegmented neutrophils. There was concern for TTP due to an intermediate PLASMIC score of 5. However, given that presentation was more consistent with vitamin B12 deficiency, plasmapheresis was deferred after a discussion with pathology. ADAMTS13 activity returned 62%. Pernicious anemia was diagnosed with labs revealed homocysteine >50, methylmalonic acid 41.97, positive anti-parietal cell antibody, and positive intrinsic factor antibody. Gastric biopsy showed atrophic gastritis. Hemoglobin stabilized at 8 after transfusions. After daily vitamin B12 injections, patient was discharged with labs showing haptoglobin 13 and LDH 1211. Patient was sent home with weekly injections.

Discussion

The decision to closely monitor our patient versus initiation of plasmapheresis was based on clinical symptoms of neuropathy and reduced taste consistent with vitamin B12 deficiency. Our patient's lab values and peripheral smear were also more reassuring of a nutritional deficiency. Severe vitamin B12 deficiency is thought to cause both intramedullary and extramedullary hemolysis. Intramedullary hemolysis caused by destruction of erythrocytes leading to ineffective erythropoiesis is more common (1). Conversely, the mechanism of extramedullary hemolysis is not well established. It is thought that the pro-oxidative qualities of homocysteine can promote thrombosis and endothelial dysfunction and subsequent microangiopathy (2). This phenomenon, commonly called pseudothrombotic microangiopathy, mimics TTP. Few laboratory values can help distinguish between TTP and an intramedullary process. First, reduced reticulocyte count suggests defective DNA synthesis and destruction of megaloblastic cells by bone marrow macrophages (3). A high MCV in the setting of low reticulocyte count is suggestive of vitamin B12 deficiency. Blood smear may also show multiple hypersegmented polymorphonuclear cells and macrocytosis in addition to schistocytes. Additionally, LDH tends to be more substantially elevated in intramedullary hemolytic processes like vitamin B12 deficiency (3). This is attributed to high LDH content of nucleated erythrocytes when compared to mature red blood cells. Immature erythrocytes contain less hemoglobin than mature red blood cells and bilirubin is relatively less elevated in vitamin B12 deficiency. Lastly, platelet counts tend to be higher in vitamin B12 deficiency than in TTP.

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MISSOURI POSTER FINALIST - CLINICAL VIGNETTE Maren Osterholt

"Bullous Erysipelas with extremely large bullae in Association with Stress Ulcers"

Title

"Bullous Erysipelas with extremely large bullae in Association with Stress Ulcers"

Authors

Maren Osterholt KCUMB, Abbigayle Carlson KCUMB, Hunter Hoopes KCUMB, and Jonathan Ericson, M.D.

Introduction

Bullous Erysipelas is an infection characterized by superficial dermis and lymphatic involvement resulting in the formation of fluid filled bullae with diffuse erythema (Clebak & Malone, 2018) . The development of a stress ulcer in the setting of a septic patient is a feared complication (Plummer et al., 2014).

Case Presentation

A 61-year-old-male with type II diabetes mellitus presented to the ED with fever and circumferential erythema on the right lower extremity, extending from the foot to just below the knee. He was found to have a WBC of 27.21 cells/liter (normal range 4,500 to 11,000) and a CRP >320 mg/L (normal

Discussion

Bullous Erysipelas is a serious infection that can lead to sepsis and stress induced ulcers. Early recognition and treatment of bullous erysipelas, as well as its complications, is essential for proper care of the patient.

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NEW JERSEY POSTER FINALIST - CLINICAL VIGNETTE Natasha Mathur

A Report of Nonuremic Calcific Arteriopathy in a COVID19 Patient

Title

A Report of Nonuremic Calcific Arteriopathy in a COVID19 Patient

Authors

Natasha Mathur - Cooper Medical School of Rowan University Brandyn Chinn DO - Cooper University Hospital, Department of Internal Medicine Brian Gable MD - Cooper University Hospital, Department of Internal Medicine Robert Duffy MD - Cooper University Hospital, Department of Dermatology Tara Jennings, MD - Cooper University Hospital, Department of Dermatology Warren Heymann, MD - Cooper University Hospital, Department of Dermatology Hillary Glick MD - Cooper University Hospital, Department of Hematology-Oncology Christina Clay MD - Cooper University Hospital, Department of Hematology-Oncology Miles McFarland MD - Cooper University Hospital, Department of Pathology

Introduction

Data surrounding SARS-CoV-2 continues to identify numerous extrapulmonary manifestations related to its infection. Chiefly among these is the creation of a hypercoagulable milieu which has been shown to cause secondary venous and arterial complications. Calciphylaxis is the deposition of calcium in small arterioles that is an uncommon complication of end-stage renal disease (ESRD), seen in about 35/100,000 patients with ESRD. Nonuremic calciphylaxis is much rarer. Nonuremic calcific arteriopathy tends to present with cutaneous lesions and is thought to be due to a hypercoagulable state. However, some studies have shown calcium deposition can occur in many vascular beds and will not necessarily lead to easily visible manifestations. In addition to pulmonary findings, there is increasing evidence that COVID-19 infection is associated with a systemic hypercoagulability disorder, raising the risk of venous thromboembolism in these patients. Nonuremic calcific arteriopathy is diagnosed by skin biopsy, which will classically show calcium deposition, fibrointimal hyperplasia, and thrombosis in small arterioles of the affected organ. In addition, intimal proliferation, fat necrosis, and fibrosis can be visualized on biopsy. Risk factors for development of nonuremic calcific arteriopathy include: female sex, obesity, diabetes mellitus, and Caucasian race.

Case Presentation

In this case, we identify a 42-year-old female without a history of renal dysfunction who initially presented with mysterious skin induration without eschar, in addition to hyperalgesia and allodynia who was found to have nonuremic calciphylaxis several weeks following infection with SARS-CoV-2.

Discussion

Due to the rarity of calciphylaxis among non-ESRD patients, we were able to link the hypercoagulable state caused by Covid-19 to the arteriolar calcium deposition. Although further work needs to be done to determine the optimal treatment for patients with nonuremic calcific arteriopathy, we were able to determine that IV sodium thiosulfate was both effective and safe. This case highlights the need to recognize non-necrotizing manifestations of calciphylaxis and to associate them in patients with multiple risk factors for calciphylaxis including hypercoagulability.

NEW JERSEY POSTER FINALIST - CLINICAL VIGNETTE Connor Rademaker

Post-Surgical Screw Fragment Causing Spontaneous Hematoma

Title

Post-Surgical Screw Fragment Causing Spontaneous Hematoma

Authors

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Introduction

Muscular hematomas can be classified as either traumatic or spontaneous, with the former usually managed conservatively, while the latter are associated with increased morbidity and mortality1. Spontaneous hematomas often occur in the anterior or posterior abdominal musculature of the gluteal region and are associated with advanced age, use of anticoagulation or antiplatelet agents, and underlying coagulopathy. Here, we present a complex case of spontaneous hematoma formation in an elderly female.

Case Presentation

An 80-year-old female with history significant for a right total hip replacement, remote stroke on aspirin monotherapy, and peripheral neuropathy presented to the emergency department with five days of right lower extremity (RLE) swelling and ecchymoses. She attributed the bruising to “bumping into a chair.” Physical exam was notable for RLE edema and intact lower extremity pulses. Laboratory data revealed hemoglobin 6.5 g/dL. Duplex scan of the RLE was negative. CT angiogram of the RLE showed diffuse enlargement of the adductor muscle suggestive of intramuscular hematoma without contrast extravasation. CT of the right femur revealed stable post-surgical changes of hip arthroplasty with a retained screw fragment at the superior acetabulum. Aspirin was discontinued. She was transfused blood and discharged hemodynamically stable with plans for outpatient endoscopy.

One month later, the patient returned with fatigue, throbbing pain, and worsening ecchymoses in the same limb. The patient’s hemoglobin dropped to 5.5 g/dL and INR was increased to 2.7. Ultrasound showed chronic liver disease not suggestive of cirrhosis. CT angiography continued to show no extravasation. Blood transfusions improved hemoglobin levels appropriately and vitamin K replacement brought INR to a nadir of 1.5. She eventually developed compartment syndrome, received a fasciotomy, and was discharged after incisions were closed.

Two weeks later, she presented again with anemia and mild bleeding from surgical sites. INR was 2.5. Patient was found to have a moderately decreased factor VII activity. Hematology did not believe this alone was significant enough to predispose the patient to this amount of bleeding. Repeat RLE angiogram showed large pseudoaneurysm of the right femoral circumflex artery, which was stented. On follow-ups, the patient did not have any bleeding or anemia for the past year.

Discussion

The patient's hematoma was initially presumed to be from trauma related to peripheral neuropathy and was managed conservatively with blood transfusions. The initial suspicion for a non-traumatic etiology was low, which delayed identification of the underlying coagulation defect and led to lack of consideration for an ongoing extravasation. It was hypothesized that the screw fragment led to vessel wall irritation, resulting in a pseudoaneurysm that was not repaired due to inhibition of primary coagulation by aspirin and secondary coagulation by an inherited factor VII deficiency. The ongoing bleed along with chronic liver disease led to consumption of clotting factors, increasing INR. Once fasciotomy excavated the hematoma, the site of the bleed could be identified on repeat imaging. Hemostasis was achieved with stent placement. This case highlights the importance of not only treating symptoms of anemia but also determining its etiology to prevent recurrent hospitalizations.

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NEW JERSEY POSTER FINALIST - CLINICAL VIGNETTE Mihika Shah

Noonan Syndrome Elicited Coronary Stent Migration

Title

Noonan Syndrome Elicited Coronary Stent Migration

Authors

Mihika Shah, MSIII; Abha Kulkarni, MSIII; Pratik B. Patel, MD, FACC

Introduction

Stent migration in a coronary vessel is a rare phenomenon, occurring in 0.3% to 1.3% of percutaneous coronary interventions (PCIs) (5). Common causes of stent loss are balloon dislodgement during implantation and pull back (5) and vasodilator therapy during the procedure (4). Most reported cases of coronary stent migration are in older patients undergoing PCIs to increase coronary vascular flow. This report is an unusual case of a 23-year-old patient with Noonan Syndrome who experienced stent migration during PCI due to vasospasm.

Case Presentation

A 23-year-old male with a past medical history significant for congenital heart defects attributed to Noonan Syndrome presented with acute onset left sided chest and bicep pain. He was experiencing dyspnea and chest pain dissimilar to any experience previously. Labs and imaging revealed an elevated troponin T level which peaked at 12 hours. An EKG showed normal sinus rhythm with right axis deviation. Patient underwent a left heart catheterization to determine the source of chest pain. The right femoral artery was utilized to introduce the catheter; however, the catheter was switched to the left femoral artery due to concern for clot, spasm, and dissection. The left femoral artery also experienced spasms which slowly resolved. Catheterization revealed no occlusive disease; however, a high grade lesion was detected in the proximal right coronary artery (RCA). Intervention was recommended and the patient was anticoagulated with Heparin 100 u/kg. Intravascular ultrasound (IVUS) was inserted, but the stent migrated to the right coronary ostium due to vasospasm in the mid-RCA. A larger stent was introduced in the mid-RCA and the procedure was completed. There were no post-operative complications and the troponin T levels normalized. Patient was placed on dual antiplatelet therapy.

Discussion

Stent migration is one of many complications that can occur during stent usage including stent fracture, infection, and in-stent stenosis. Some causes of migration include anomalous anatomy of the vessels, stent properties, decision-making errors, and hemodynamic displacement forces (3). For instance, in many reported cases of coronary stent migration the cause is stent deformation due to vessel dilation after stent placement (5). In this case, the patient experienced stent migration due to under-sizing of the

vessel prior to stent placement and coronary vasospasm. This can be attributed to the history of Noonan Syndrome (2). There are management options for migratory stents. These include retrieving, repositioning, surgical removal, or not manipulating the stent. Factors used to determine method of management include stent properties and a risk-benefit analysis of intervention versus precaution (3). In this case, the migratory stent was not repositioned due to the vasospasms the patient seemed to be experiencing. Some complications of stent migration include penetration and perforation. These can result in further hemodynamic instability; however, a greater number of cases of perforation and penetration have been reported with biliary and renal stent placements (1). Overall, coronary stent migration is a rare complication of stent deployment in percutaneous coronary intervention.

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NEW JERSEY POSTER FINALIST - CLINICAL VIGNETTE Mihika Shah

Retroperitoneal Leiomyosarcoma Resection Using Veno-Venous Bypass with Fluoroscopic Guidance

Title

Retroperitoneal Leiomyosarcoma Resection Using Veno-Venous Bypass with Fluoroscopic Guidance

Authors

Mihika Shah, MSIII; Rachel E. NeMoyer, MD, MPH; Randy Shafritz, MD; Enrique J. Pantin, MD

Introduction

Leiomyosarcomas are rare tumors of smooth muscle cells with intraluminal or extraluminal growth. Vascular leiomyosarcomas are the most common tumors affecting the vascular system, and they account for 5% of all leiomyosarcomas (3). Despite being rare, vascular sarcomas usually originate from the inferior vena cava (IVC) and other large veins more frequently than arteries. Surgery remains the mainstay of treatment. Here we present a retroperitoneal leiomyosarcoma involving both the IVC and the abdominal aorta that required IVC reconstruction and an aortobifemoral bypass with fluoroscopy for veno-venous (vv) bypass cannulation.

Case Presentation

A 63-year-old male presented with excruciating back pain. He underwent abdominal imaging and was found to have a 6x5cm mass anterior to the IVC and below the renal veins. The patient underwent 6 months of systemic chemotherapy which demonstrated no tumor growth qualifying him for surgery. A 16Fr cannula was inserted into the left internal jugular vein. The abdomen was explored and the involved infrarenal aorta was resected and repaired with Dacron tube graft, except for the back wall. The retroperitoneum was explored, vv bypass was initiated after insertion of an 18Fr femoral vein cannula, and the cava was clamped. The IVC was then controlled and the entire right retroperitoneum was resected en bloc. The mass measured 10cm in dimension. The IVC was reconstructed with a polytetrafluoroethylene tube graft. The vv bypass was essential to maintain venous return and hemodynamic stability during the resection and caval reconstruction. The patient was extubated the following morning and recovered well from the procedure with no postoperative complications.

Discussion

We present a rare case of a retroperitoneal leiomyosarcoma with advanced IVC and abdominal aorta involvement leading to en bloc tumor resection. The optimal treatment for retroperitoneal leiomyosarcoma is resection of the tumor with preoperative or postoperative chemotherapy, and in selected cases radiotherapy. However, despite this treatment, the prognosis for patients is relatively poor, with five- and ten-year survival rates of 38% and 14%, respectively (2,4). This case presented several anesthetic challenges and limitations including the inability to use epidural analgesia and right

innominate vein stenosis. The combined use of ultrasound and fluoroscopy allowed for evaluation of the left internal jugular (IJ) vein size and insertion of a large venous drainage cannula next to a previously placed 9 Fr introducer. Essentially, the imaging reduced potential for vascular insertion complications. Placing the venous cannula at the beginning of the operation in preparation for potential vv bypass allowed for early and stepwise management of unexpected access challenges. The vv bypass was used to maintain venous return to the heart and decompressed intestinal venous stasis when the IVC was clamped (1). Overall, this case illustrates the importance of an interdisciplinary approach to patient care, stressing the necessity of pre-operative planning with all teams involved in the case.

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NEW JERSEY POSTER FINALIST - CLINICAL VIGNETTE Justin Tiongson

Tuberculous Pleural Effusion Superimposed on a Case of Sarcoidosis: A Case Report

Title

Tuberculous Pleural Effusion Superimposed on a Case of Sarcoidosis: A Case Report

Authors

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Introduction

Tuberculosis (TB) is a chronic granulomatous infectious disease that can present with pulmonary or extrapulmonary symptoms. Tuberculous pleural effusion (TPE) is the second most common form of extrapulmonary TB and is the most common cause of pleural effusion in areas where tuberculosis is endemic. It typical presents as an acute febrile illness accompanied by nonproductive cough and pleuritic chest pain. However, the diagnosis of TPE may be delayed in favor of other causes of exudative pleural effusion, such as malignancy or sarcoidosis. This is especially challenging in regions where TB is not endemic and when patients present with nonspecific or confounding clinical manifestations.

Case Presentation

An 81-year-old woman in New Jersey with a history of stage III chronic kidney disease presented to her PCP with a persistent dry cough for a few weeks. The cough was predominantly nocturnal, worse while lying supine, productive of minimal sputum, and associated with unintentional weight loss. She denied fevers, chills, night sweats, fatigue, shortness of breath, hemoptysis, myalgias, and a history of immunosuppressive disease. She was up to date on her pneumococcal vaccinations and received flu shots annually. The clinical exam was unremarkable and the diagnosis of post-viral tussive syndrome was made. Her cough persisted after two weeks and she underwent chest X-ray, which demonstrated a small right-sided pleural effusion. At this point, she was referred to Pulmonology for a diagnostic thoracentesis, which aspirated clear, exudative fluid rich in lymphocytes. Additionally, bronchoscopy with endobronchial ultrasound-guided transbronchial fine needle aspiration (EBUS-TBNA) revealed several lymph node biopsy specimens positive for non-caseating granulomas and negative for malignant cells. She was subsequently diagnosed with sarcoidosis and started on oral prednisone therapy. Five days after her diagnosis, nearly a month after the pleural fluid was initially drawn, cultures returned positive for Mycobacterium tuberculosis. Prednisone was discontinued and the patient was referred to Infectious Disease for appropriate management.

Discussion

As demonstrated in our patient, the diagnosis of tuberculous pleural effusion may be delayed due to a nonspecific clinical presentation. The challenges of distinguishing sarcoidosis from tuberculosis in the absence of definitive microbiologic evidence have been well described, particularly when considering extrapulmonary manifestations of TB. A review of literature on this topic demonstrates a limited sample of patients found to be positive for TB after an initial diagnosis of sarcoidosis, corroborating the findings of our case. Mixed recommendations exist regarding the empiric treatment of TB in the setting of pleural effusion. Moreover, the clinical relevance of coexistent sarcoidosis and tuberculosis, as well as their pathogenic relationship, is not completely understood. Several studies have implicated a possible causal relationship between infectious exposure to TB and the development of sarcoidosis, as well as shared genetic properties between these two diseases. Further research is necessary to better formulate a clear diagnostic approach to pleural effusions in the setting of sarcoidosis and other systemic disease.

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NEW YORK POSTER FINALIST - CLINICAL VIGNETTE Rachel Davidov

Reactivation of Tuberculosis (TB) in a Veteran with Chronic Lymphocytic Leukemia

Title

Reactivation of Tuberculosis (TB) in a Veteran with Chronic Lymphocytic Leukemia

Authors

Rachel Davidov, MS Azib Shahid, MD Ghaith Shaaya, MD

Introduction

Tuberculosis (TB) is an infectious disease that causes over 1 million deaths worldwide every year. It is estimated that one third of the world's population is infected with TB in a latent state. Patients with hematologic malignancies are at a greater risk of progressing to active TB once infected, yet the diagnosis of TB in these patients is challenging because they present with a different set of clinical characteristics compared to those of patients without any underlying disease. (1)

Case Presentation

Mr. S is a 61-year-old male veteran with a history of chronic obstructive pulmonary disease (COPD) on 2-3L of home oxygen, and indolent chronic lymphocytic leukemia diagnosed with flow cytometry, currently under surveillance. The patient presented with shortness of breath and productive cough worsening for 1 week. Additionally, the patient reported occasional chills, night sweats, and a 20lb unintentional weight loss in the last 6 months. He denied hemoptysis, fevers, chest pain, nausea, vomiting, diarrhea, sick contacts, recent travel, or incarceration. Vital signs were normal except for a heart rate of 110. Physical exam was positive for bibasilar wheezing. Labs revealed a D-dimer of 1.52ug/mL. Complete blood count and comprehensive metabolic panel were normal. Covid-19 test was negative. Chest X-ray and CT angiography of the chest showed severe diffuse interstitial infiltrates predominantly in the upper lobes with significant pathological appearing lymph nodes in the mediastinum. There was no evidence of pulmonary embolism. Oncology and Pulmonology services were consulted, and the patient underwent a bronchoscopy with endobronchial ultrasound to obtain a biopsy of a mediastinal lymph node. The patient was treated with antibiotics and steroids for COPD exacerbation and showed significant clinical improvement. Lymph node biopsy showed low grade lymphoproliferative disorder. Bronchoalveolar lavage and bronchial washings showed acid-fast bacilli (AFB) positive 4+ on AFB smear and mycobacterium tuberculosis complex in the culture. The patient was then started on directly observed therapy with Isoniazid, Rifampin, Pyrazinamide, and Ethambutol, with Pyridoxine supplementation. The patient was deployed by the military and served in several middle eastern countries. While in the United states, the patient temporarily stayed at a nursing home. Tuberculin skin tests (TST) were negative throughout the patients' history. Screening for TB can be performed by a TST or an Interferon-gamma release assay (IGRA). Patient's with immunodeficient conditions (e.g. Hematological malignancies) have a lower sensitivity of TST, therefore a combined TST-IGRA test should be the test of choice in such patients. (1)

Discussion

This case emphasizes the importance of appropriate screening for TB in high-risk populations to allow early identification and treatment when the disease is in its latent stage. It also highlights the associated public health concern posed by individuals with active TB masked by other comorbid conditions. In this case, clinical diagnosis was delayed due to comorbid COPD and hematological disorder which can present with cough and B symptoms (fever, night sweats, weight loss) respectively. Clinicians need to have a high suspicion of TB in such cases to contain public health exposure and start treatment as soon as possible.

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NEW YORK POSTER FINALIST - CLINICAL VIGNETTE Daniel Griepp

When a Stuffy Nose Won't Go Away: Rhabdomyosarcoma Masquerading as Adenoiditis

Title

When a Stuffy Nose Won't Go Away: Rhabdomyosarcoma Masquerading as Adenoiditis

Authors

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Introduction

Embryonal Rhabdomyosarcoma is a malignant mesenchymal proliferation of immature skeletal muscle and may arise in children in the orbit, middle ear, nasal cavity, paranasal sinuses, or nasopharynx. Clinical diagnosis may be difficult in a subset of patients who have no significant deformities or irregularities upon visual inspection of the oropharynx. Rhabdomyosarcoma in this setting may be mistaken for a more common underlying etiology such as upper respiratory infection. We report a case of a seven-year-old male with embryonal variant rhabdomyosarcoma previously misdiagnosed by three different physicians to be adenoiditis based on clinical exam and laryngoscopy.

Case Presentation

An otherwise healthy seven-year-old boy presented to the emergency room complaining of intermittent fevers and noisy breathing worsening over the past three weeks. He had been evaluated three times at outside institutions for persistent, unexplained upper respiratory symptoms. Laryngoscopy had been previously performed and revealed significantly enlarged adenoids, but otherwise normal anatomy. CT head and neck revealed a large 4.6cm x 2.7cm x 3.3cm mass involving the right side of the nasopharynx. This extended laterally into the parapharyngeal space, superiorly to the skull base, and inferiorly to the level of the soft palate with local mass effect. The posteroinferior aspect at the level of the soft palate was likely what contributed to incorrect diagnosis of adenoiditis during laryngoscopy, leading to misdiagnosis. The mass appeared to be obstructing the right eustachian tube with associated right mastoid disease. The differential for the nasopharyngeal mass included nasopharyngeal carcinoma, dermoid cyst, and rhabdomyosarcoma. Pathological analysis of biopsied tumor revealed embryonal variant rhabdomyosarcoma with immunohistochemistry positive for desmin and actin. It was determined that the patient did not have concurrent adenoiditis, or adenoiditis secondary to rhabdomyosarcoma. Given the complicated location and large size of the tumor, the patient was treated medically with combined chemotherapy with vincristine and dactinomycin with favorable recovery and resolution of symptoms at the 1-year follow-up.

Discussion

This case highlights the capacity for rhabdomyosarcoma occurring in the head and neck region to mimic a commonly encountered upper respiratory tract infection. Rhabdomyosarcoma accounts for 3% of all pediatric neoplasms and half of all solid malignancies in patients less than ten years of age. Fewer than 25% of cases have overt signs of metastasis at the time of diagnosis. Common sites of metastasis include the lungs, bone marrow, bone, omentum, and pleura. Although there was significant mass effect on the nasopharynx and the tumor was adjacent to the soft palate inferiorly and skull base superiorly, there was no indication of surrounding invasion or nodal involvement, confirming a lack of metastatic spread. The present patient demonstrates the importance of maintaining a high level of diagnostic vigilance and clinical suspicion of non-infectious etiologies when symptoms persist over a prolonged period. This is particularly important, given the misdiagnoses of adenoiditis that occurred following workup by three different physicians.

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NEW YORK POSTER FINALIST - CLINICAL VIGNETTE Daniel Griepp

Adnexal Carcinoma of the Scalp: Aggressive Sebaceous Differentiation with Invasion of the Orbital Wall and Thoracic Vertebra

Title

Adnexal Carcinoma of the Scalp: Aggressive Sebaceous Differentiation with Invasion of the Orbital Wall and Thoracic Vertebra

Authors

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Introduction

Adnexal carcinoma is a rare malignant tumor that typically does not present as a large head mass. We present a case of a pathologically adnexal carcinoma of the head that presented after four years of growth. We review the characteristic imaging findings and correlate it with clinicopathological data.

Case Presentation

A 65-year-old woman with past medical history of chronic posterior head mass presented with worsening left arm pain, numbness, and decreased grip strength for the past two weeks. The head mass had been present for the past four years but had grown rapidly in the past four months. It was previously asymptomatic and never received a medical workup. Examination of the scalp revealed a large posterior solid occipital mass with centralized necrotic tissue that was painful to touch. The overall mass was not tender to palpation and exhibited normal skin color. Physical exam revealed prominent left posterior cervical and auricular lymphadenopathy. A core needle biopsy demonstrated stage IV adnexal carcinoma with sebaceous differentiation. CT head showed the giant pedunculated occipital mass to have solid, calcified, and cystic components associated with multiple smaller subcutaneous and subgaleal masses. 3D CT reconstruction shows the remarkable size, as well as the necrotic center on the right posterolateral aspect of the mass. CT head also showed scattered enhancing lesions were also seen in the calvarium and lateral orbital walls bilaterally consistent with bony metastatic disease. MRI cervical spine demonstrated impingement of the left C8 and T1 nerve roots due to epidural and paraspinous soft tissue extending posteriorly, consistent with clinical picture and suspicious for metastatic disease. The patient was lost to follow-up and one month later, MRI brain demonstrated evidence of direct invasion into the underlying parietal calvarium with bony thickening and enhancement.

Discussion

Adnexal carcinoma of the scalp is a rare malignant tumor. Furthermore, tumors of this size with malignant transformation and metastatic spread are even more rare as patients typically seek appropriate treatment. CT and MRI can provide suggestive radiological features such as solid, calcified, and cystic components consistent with sebaceous differentiation, as well as screen for bony metastases, which in this case were noted in the orbit and thoracic spine. Comprehensive review of literature revealed no previous reports of adnexal tumors with such remarkable size with no similar cases of metastases reported in the orbital wall and thoracic spine. To our knowledge, it is the largest sebaceous carcinoma to be reported occurring in the scalp.

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NEW YORK POSTER FINALIST - CLINICAL VIGNETTE Sasmith R Menakuru

Refractory Metabolic Acidosis Treated with Sustained Low-Efficiency Daily Dialysis in a patient with severe Diabetic Ketoacidosis

Title

Refractory Metabolic Acidosis Treated with Sustained Low-Efficiency Daily Dialysis in a patient with severe Diabetic Ketoacidosis

Authors

Sasmith Menakuru, Mohana Cherukuri, Mir Inzamam Ali, Sruti Kalla, Shruti Gupta

Introduction

Diabetic ketoacidosis (DKA) is a common presenting symptom of people who have type 1 diabetes mellitus. Patients with particularly severe symptoms of DKA can develop an acute kidney injury however in most cases these patients will respond to fluid resuscitation, insulin, and other supportive measures. We present a case of a young woman who presented with DKA which eventually progressed to a severe AKI refractory to treatment. Our patient was treated with sustained low-efficiency daily diafiltration versus the usually continuous renal replacement therapy or peritoneal dialysis.

Case Presentation

A 21-year old woman initially presented to the hospital with complaints of fever, abdominal pain, altered sensorium, drowsiness, and abdominal pain for the past 5 days. She had tachycardia, tachypnea, feeble pulses, hypotension, and cool extremities to the touch. Her blood glucose was above 500 and urinary ketones were 4+. She also had severe metabolic acidosis with an increased anion gap on blood gas analysis. This allowed us to formulate a provisional diagnosis of type 1 Diabetic Mellitus presenting with Diabetic Ketosisacidosis. The patient management included IV fluids and insulin infusion at a rate of 0.1U/Kg/hr. On day 2 the patient had decreased urine output (?0.5mL/Kg/hr) with edema and persistent metabolic acidosis despite adjusting corrective measures based on blood glucose and electrolyte values. The patient's clinical condition slowly deteriorated and she developed shock and acute kidney injury. This was confirmed by renal function testing which revealed elevated urea, creatinine, and oliguria. Treatment was updated to include dopamine, norepinephrine, intravenous antibiotics, and sodium bicarbonate. Since her kidney injury was progressing as well as having persistent metabolic acidosis the patient was put on renal replacement therapy. SLEDD was performed instead of peritoneal dialysis due to the patient having abdominal scarring from a previous umbilical hernia operation and lack of proper help at home. CRRT was not able to be done due to a lack of equipment at our rural hospital. SLEDD was continued and insulin infusion was titrated from days 3-7. There was a clinical improvement with improved urine output along with labs, normalized blood sugar levels, and decreased edema. She was

placed under observation for 2 weeks at the end of which she remained euglycemic with adequate urine output.

Discussion

Acute kidney injury is a known complication of diabetic ketoacidosis however most patients respond to simple corrective measures such as fluids, bicarbonate, and insulin. (1) Refractory metabolic acidosis needing dialysis is rare in patients presenting initially with DKA such as in our patient. (2) In our case, SLEDD was utilized instead of the more common peritoneal dialysis with further adds to the uniqueness of this case. Our patient was given SLEDD for refractory metabolic acidosis and hemodynamic instability. After treatment, her metabolic acidosis improved which led to an improvement in her shock and sensorium. On a review of previous case reports, we could not find any cases similar to ours due to the treatment being SLEDD.

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NORTH CAROLINA POSTER FINALIST - CLINICAL VIGNETTE An Bui

Deception of Left Ventricular Noncompaction Cardiomyopathy: When Diagnosis Becomes Too Late

Title

Deception of Left Ventricular Noncompaction Cardiomyopathy: When Diagnosis Becomes Too Late

Authors

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Introduction

Left ventricular noncompaction cardiomyopathy (LVNC) is a rare genetic variant leading to poor compaction of the myocardium. In a 10-year study with 37,555 transthoracic echocardiogram reviewed, 17 cases were diagnosed with 6-year follow up period resulting in mortality at 50% [1]. However, the infrequency of symptomatic cases until late in disease course makes it a difficult diagnosis for prevention of heart failure and eventual complication such as thromboembolism [3]. Awareness and knowledge of management of LVNC is essential in providing effective care for prevention of secondary complication involved with hemostasis due to heart failure. This report describes a case of diagnosis and treatment of LVNC associated with pulmonary embolism.

Case Presentation

A 36-year-old African American male with a past medical history significant for hypertension, heart failure with an ejection fraction of 25% found 3 months prior presented to the hospital with progressive dyspnea and bilateral lower extremity edema. On admission, he showed signs of obstructive shock due to bilateral pulmonary embolism and was taken to the intensive care unit for treatment. His transthoracic echocardiogram showed an ejection fraction equal to 15% and vegetation attached to the cardiac papillary walls. In contrast, his transesophageal echocardiogram did not show any signs of vegetation but showed a 2 layer structure within the apex and left lateral portion of ventricular myocardium with finger-like strips of myocardium with intertrabecular recesses. These findings led to the diagnosis of left ventricular noncompaction cardiomyopathy. Treatment was initiated with anticoagulants and heart failure regimens.

Discussion

This patient's case highlights the importance of recognizing LVNC early to prevent complications such as heart failure or thromboembolism. Although prevalence of LVNC has increased with improved echocardiography qualities, it is unknown whether the complication of thromboembolism is due to the hemostasis within the intertrabecular recesses or low ejection fraction from severe cardiomyopathy [2].

The difficulty of LVNC's symptomatic presentation makes it crucial to improve recognition of diagnosis and current criteria for prevention of worsening heart failure.

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OHIO POSTER FINALIST - CLINICAL VIGNETTE Carlos Arias Bermudez

Are Venous Thromboembolic Events Underdiagnosed in Stroke Patients? A Case Report and Literature Review

Title

Are Venous Thromboembolic Events Underdiagnosed in Stroke Patients? A Case Report and Literature Review

Authors

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Introduction

Several studies have demonstrated an association between ischemic stroke and venous thromboembolic events (VTE) with or without the presence of Patent Foramen Ovale (PFO). The mechanism remains uncertain. Stroke patients routinely undergo screening for PFO but there are no guidelines to screen for VTE in those patients, which is critical for choosing a secondary prevention regimen.

Case Presentation

A 75 year old man with history of Parkinson's disease, hypertension, diabetes mellitus type II, and hyperlipidemia presents to the emergency department with slurred speech. Per his wife, the patient was in his usual state of health until he woke up at 00:30 with slurred speech, right arm flailing and inability to move his legs. Vital signs were stable and within normal limits. NIHSS score was 4 initially with right facial droop, aphasia, dysarthria, and right upper extremity weakness. A head and neck CT angiogram was negative for obstructions but showed an incidental bilateral apical pulmonary emboli (PE). Brain MRI revealed an acute infarct in the left thalamus with hemorrhagic transformation. Bilateral segmental PEs were later confirmed with a dedicated chest CT. The patient denied shortness of breath, lower extremity pain or swelling, or history of thromboembolic events. However, he reported limited mobility for a few days due to back pain. Doppler ultrasound showed deep vein thrombi (DVT) in the posterior tibial and peroneal veins. Echocardiogram showed a PFO. The patient was treated with permissive blood pressure control, aspirin, statin, and heparin drip. He tolerated anticoagulation well, and therefore he was transitioned from heparin to an anti-X inhibitor. Neurological deficits improved by the time of discharge to a nursing facility for rehabilitation.

Discussion

We present a patient who suffered an acute ischemic stroke and was found to have a silent DVT and PE. He also had a PFO on echocardiogram. Multiple studies have demonstrated similar association. In a cohort study on 151 cryptogenic stroke patients, Tanislav et al found PE in 37% of studied subjects and DVT in 7% (1). However, other retrospective studies had much lower PE incidence (0.2 to 4.4%) among stroke patients (2-4). On the other hand, studies that screened PE patients for stroke found an incidence of 7.5 to 21% with the vast majority being silent strokes (5-8). Furthermore, the subgroup of PE patients with PFO had significantly higher risk of developing stroke when compared to patients without PFO (5, 6). These findings support the hypothesis that a single thrombotic source leads to two embolic events, one in the lung vasculature and one in the brain through the PFO. This evidence suggests that VTE might be underdiagnosed in many stroke patients, which will affect secondary stroke prevention. Large prospective trials are needed to identify efficient screening methods especially in the subgroup of patients with PFO. Possible methods include expanding brain and neck CT angiogram to scan the chest, training radiologist to specifically screen for apical PE on neck CT angiogram, or creating predictive modules utilizing large databases.

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OHIO POSTER FINALIST - CLINICAL VIGNETTE Nathan Callender

Birth in the Era of SARS-CoV-2: Evolving Neonatal Care and a Case Presentation

Title

Birth in the Era of SARS-CoV-2: Evolving Neonatal Care and a Case Presentation

Authors

Nathan Callender, BA; Dr. Ansley Splinter, MD, MAcM

Introduction

SARS-CoV-2 (COVID-19) is a novel virus. The clinical presentation is diverse. Best practices for prevention and care of infected patients are evolving. This case demonstrates a unique neonatal presentation of SARS-CoV-2.

Case Presentation

A full-term male was born via spontaneous vaginal delivery to a G4P2 mother. The immediate neonatal period was unremarkable, and he was discharged on day of life (DOL) 1 successfully breastfeeding and supplementing with formula per his mother's choice. On DOL 5 the mother noted he was no longer feeding well at the breast nor taking formula. He was evaluated by his primary care physician who noted difficulty feeding and jaundice that did not meet criterion for intervention. Close follow-up was arranged in case of a lack of clinical improvement. The neonate did not improve over the next 24 hours and was subsequently admitted to the hospital on DOL 7. Surveillance COVID-19 nasopharyngeal swab RT-PCR testing was negative on admission. A full septic workup was also negative. He received 24 hours of broad-spectrum antibiotics and intravenous fluids. OT and lactation services were consulted in the interim, and his feeding activity over the next 72 hours was noted to be improved. The patient met discharge criterion on DOL 11. However, on DOL 12, he was readmitted for persistent feeding difficulties. Surveillance COVID-19 nasopharyngeal swab RT-PCR testing was positive on DOL 13. Supportive care was again provided, and the patient was discharged on DOL 16 with appropriate weight gain and levels of activity. No sick contacts were identified, and it remains unclear where the patient contracted COVID-19.

Discussion

The presentation of COVID-19 in neonates is often centered around mild respiratory distress and fever [1, 2]. Severe presentations have been observed, most notably multi-system inflammatory syndrome in children and disseminated intravascular coagulation, however

current data suggest these disastrous syndromes are far less common than the aforementioned mild respiratory distress and fever [3]. This case presentation highlights that isolated feeding difficulty can be the presentation of COVID-19 infection in the first days of life. Furthermore, this case highlights the importance of maintaining a high clinical suspicion of infection with COVID-19 even in the face of reported negative results, as false-positive and false-negative results have been reported [4].

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OHIO POSTER FINALIST - CLINICAL VIGNETTE Mary Hennekes

Neck Pain – A Benign Finding in a Case of Urosepsis?

Title

Neck Pain – A Benign Finding in a Case of Urosepsis?

Authors

1. Mary Hennekes, Case Western Reserve University School of Medicine, Cleveland, OH

2. Melissa Jenkins, MD, Associate Professor, Division of Infectious Disease, The MetroHealth System, Cleveland, OH

Introduction

Septic arthritis of the facet joints with or without spondylodiscitis is a rare entity causing only 4% of pyogenic spinal infections1,2. Lumbar spine facet joint septic arthritis is most common3, followed by thoracic spine infection, and more rarely cervical infection. The most common mechanism of infection involves hematogenous spread1,2,4, particularly to bone with recent or prior trauma resulting in disrupted vertebral architecture1.

Case Presentation

A 59-year-old woman with a history of hepatitis C with cirrhosis, peptic ulcer disease, substance use including active IV drug use, depression, and resolved subdural hematomas complicated by seizures presented to the emergency department (ED) with full body rigors, chills, and myalgias of 1-day duration. She endorsed a 1-week history of urinary frequency, urinary incontinence, and suprapubic abdominal pain. In the ED, she was found to be febrile to 103°F, tachycardic, and tachypneic and stabilized with acetaminophen and IV fluids before transfer to the general medical floor. On admission to the floor, she endorsed worsening of her chronic neck pain and exhibited limited range of motion. This was initially attributed to a trauma history. She was managed with ketorolac injections, topical ointment, and heat packs with only mild improvement in symptoms. The patient also admitted to using IV heroin 3 days prior and a systolic murmur was appreciated on cardiac exam, so blood cultures were drawn with concern for endocarditis. Urine cultures were also sent. Both blood and urine cultures grew *E. coli*, the patient was started on cefepime. An echocardiogram demonstrated no valvular vegetations. Repeat blood cultures demonstrated clearance of *E. coli* but grew MSSA. A left knee wound found on later exam also grew MSSA. Because her neck pain had not yet improved, a C-spine X-ray was ordered which showed significant arthropathy and an endplate irregularity at C2-C3 as compared with prior imaging. Follow up MRI performed for concern of osteomyelitis

demonstrated facet joint septic arthritis and spondylodiscitis at C2-C3. Repeat blood cultures demonstrated bacterial clearance. Antibiotic therapy was changed to cefazolin and a PICC was placed for 6 weeks of antibiotics on discharge.

Discussion

This case illustrates how premature closure can lead to delayed or missed diagnoses. Although her initial workup was consistent with urosepsis, the finding of MSSA was unexpected. The subsequent diagnosis of septic arthritis and spondylodiscitis changed antibiotic choice and duration. A delay in diagnosis of *S. aureus* bacteremia and subsequent osteomyelitis or septic arthritis can lead to complications such as epidural abscesses, joint destruction, and spinal cord compression2,5, particularly in the cervical spine. It is, thus, imperative to have a low threshold of suspicion for occult bacteremia with metastatic sites of infection, particularly in persons who inject drugs.

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OHIO POSTER FINALIST - CLINICAL VIGNETTE Monica Larson

Bilateral Thromboangiitis Obliterans (Buerger's Disease) Exacerbation

Title

Bilateral Thromboangiitis Obliterans (Buerger's Disease) Exacerbation

Authors

Monica Larson, MS3, Case Western Reserve University School of Medicine Dr. Melissa Jenkins, MetroHealth, Cleveland

Introduction

Thromboangiitis Obliterans (TO) is a medium and small vasculitis that results in inflammatory, obstructive thrombi. Unlike other vasculitic diseases, it is not inflammation of the vessel walls that occludes the vessel, but a clot consisting of neutrophils, and then fibrotic tissue as the clot becomes chronic. Flares of TO are also unique amongst the vasculitides because the inflammation can spread to adjacent veins and neurovascular tissue. This disease classically presents in smokers, and the primary treatment is smoking cessation.

Case Presentation

Mr. P. is a 44yo male who presented with an acute exacerbation of TO. He had been diagnosed 6 years prior to presentation upon autoamputation of his 3rd digit. He is a former smoker, but has not smoked in 9 months. This admission, the patient presented with acute severe right hand pain and swelling. He was admitted to the Step Down Unit to receive an alprostadil drip for vasodilation. Vascular evaluation showed no occlusive disease and no need for surgical intervention. The patient's pain and swelling persisted for 12 days despite treatment with oral sildenafil and cilostazol. Vascular occlusion never occurred. On hospital day 15, after his right hand swelling began improving, the opposite hand swelled and caused extreme pain. Vascular studies again showed no occlusion, and the pain and swelling resolved in 5 days. To manage the pain, the patient required a combination of buprenorphine, acetaminophen, naproxen, gabapentin, and duloxetine, which were ultimately tapered to acetaminophen and naproxen alone. The patient was incarcerated, and was not permitted to take buprenorphine or gabapentin in prison, so the tapering process lengthened his stay.

Discussion

Several aspects are interesting about this case. First, the treatment options for TO are limited. As a result, much of this patient's management involved a "watch and wait" strategy to observe

for improvement of pain and swelling. The first line treatment of vasodilators was not sufficient for timely resolution of symptoms, and as this is a relatively rare condition, there were limited secondary treatment options. TO flares following smoking cessation are rare, yet this patient, though a former smoker, had not been smoking prior to the flare, nor was he exposed to second hand smoke due to his incarceration (Olin, et al). With consideration of this case, it would be valuable to consider other environmental triggers which may exacerbate TO. This case represents multi-limb involvement in a flare, and emphasizes the importance of evaluating all limbs and areas at risk during an acute flare, as symptoms of occlusion may develop at different times. TO is a serious, extremely painful disease that often results in autoamputation; as such, adequate pain control is essential. This patient's incarceration compromised optimal pain management, resulting in a prolonged hospital stay. The strict limitations on pain medications within the corrections system may put this population at risk for poorly managed pain. Physicians can play a role in advocating for appropriate pain management for incarcerated individuals with illnesses such as TO which require high levels of pain medication.

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OHIO POSTER FINALIST - CLINICAL VIGNETTE Parker Trent

Yamaguchi of the Young: Apical Hypertrophic Cardiomyopathy in a College Athlete

Title

Yamaguchi of the Young: Apical Hypertrophic Cardiomyopathy in a College Athlete

Authors

2LT Parker T. Trent, MS3, Northeast Ohio Medical University

Introduction

Yamaguchi syndrome, also known as Apical Hypertrophic Cardiomyopathy (ApHCM) is a less common variant of Hypertrophic Cardiomyopathy (HCM). ApHCM is characterized by hypertrophy of the apex of the heart and typically is not obstructive. ApHCM occurs in up to 25% of HCM patients of Asian descent and 1-10% of non-Asian HCM patients.1 Though patients with Yamaguchi syndrome are usually asymptomatic, they are at increased risk for cardiac complications such as atrial fibrillation, myocardial infarction, and congestive heart failure.2 Most cases are diagnosed between the 3rd and 6th decades of life.3 However, the literature reports a few cases of young athletes who experienced significant cardiac events, including cardiac arrest, that were subsequently diagnosed with ApHCM.4,5 These reports of cardiac arrest in young athletes with Yamaguchi Syndrome highlight the importance of an early diagnosis during routine athletic physical exams.

Case Presentation

We report here the case of a 17-year-old black male soccer player who was referred to Cardiology by his high-school athletic trainer for an abnormal ECG. The initial ECG showed high voltage QRS complexes, diffuse deep T-wave inversions, and ST changes. He has no personal medical history or family history of heart conditions. Physical exam revealed a systolic murmur and no other findings. A transthoracic echocardiogram was read as not having any significant abnormalities, however it also reported mild thickening of the apex of the left ventricle. The next year his collegiate soccer trainer referred him to another Cardiologist for his abnormal ECG with ST and T-wave changes as described above. Upon reviewing his past echocardiogram and ECG's, a preliminary diagnosis of Yamaguchi's syndrome was established, and a cardiac MRI and 3-day event recorder were ordered. The MRI confirmed the apical thickening of the left ventricle which is consistent with Yamaguchi's syndrome. It also showed obliteration of the left ventricle apex during systole, a left ventricular ejection fraction of 72%, and an absence of left ventricular outflow obstruction. The event monitor results showed no abnormalities. Following a group decision-making effort by the patient, the parents, the cardiology team, and the

athletic trainers, he was allowed to continue playing soccer with scheduled follow up in 8-12 months to monitor his left ventricular systolic function.

Discussion

As seen in this case, ApHCM can easily be missed on a standard transthoracic echocardiogram. Fortunately, this patient was diagnosed on re-evaluation and was completely asymptomatic. The cases of young athletes that weren't as lucky go to show that missing a diagnosis of ApHCM can have tragic consequences. These literature cases as well as the one presented here indicate the need to re-evaluate the use of transthoracic echo as a diagnostic tool in young athletes presenting with abnormal ECG findings. It is also important to ensure athletic trainers are aware of how this disease presents so that effected athletes will be appropriately referred for a full evaluation.

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OHIO POSTER FINALIST - CLINICAL VIGNETTE Phillip Wachowiak

A case of Erdheim-Chester Disease (ECD) with gastrointestinal involvement

Title

A case of Erdheim-Chester Disease (ECD) with gastrointestinal involvement

Authors

Phillip Anjum, Reed Geisler, Kaitlin Kavanaugh

Introduction

Erdheim-Chester disease (ECD) is a rare form of non-Langerhans cell histiocytosis derived from a monocyte-macrophage lineage. Somatic mutations of BRAF or other components of the MAPK signaling pathway are present in more than 50% of patients with ECD 1. This multisystem disease presents as histiocytic infiltration with sheets of foamy histiocytes on biopsy, and it can encompass a wide spectrum of disorders. Skeletal involvement, the most common clinical manifestation, occurs in the form of multifocal sclerotic lesions in the long bones of lower limbs. Other common clinical features include diabetes insipidus, neurologic symptoms, constitutional symptoms, circumferential thickening of the aorta, and retroperitoneal fibrosis 2.

Case Presentation

A 35 y.o. male with a history of retinitis pigmentosa, hypertension, diabetes insipidus, bilateral ureteral obstruction status post bilateral nephrostomy tubes, avascular necrosis of the left hip, and ECD presented with a 4-day history of nausea, vomiting, diarrhea, and abdominal pain. He reported not being able to keep anything down and having a decreased appetite. His last bout of emesis occurred the morning of presentation, while his last bowel movement occurred the morning before presentation. He denied flatus for several days. The patient had initially presented 1 month prior for idiopathic bilateral ureteral obstruction. During that hospital stay, a bone scan showed diffuse uptake within osseous structures, and a PET scan revealed bilateral tonsillar uptake and diffuse hypermetabolic activity within bilateral adrenal glands with soft tissue thickening. Diagnosis of ECD was confirmed with a mandible and maxillary biopsy that revealed chronic xanthogranulomatous and lymphocytic inflammation consistent with the disease. On exam, the patient's abdomen was soft, distended, and had mild tenderness to palpation. The physical exam was otherwise unremarkable. He was hypertensive to 152/91, but otherwise his vitals and labs were within normal limits. A CT showed dilated loops of jejunum and proximal ileum, with a focal distal transition point of small bowel dilation at an ileal loop in

the patient's right lower quadrant, consistent with small bowel obstruction, as well as mild wall and fold thickening of the jejunum and ileum, suggestive of acute enteritis. The patient was initially managed conservatively for small bowel obstruction with a nasogastric tube and bowel rest. By the fourth day of hospital stay, the patient still reported minimal flatus. He received a dose of prednisone and was taken to the OR that day for diagnostic laparoscopy, during which he was found to have no small bowel obstruction or adhesions. An inflamed jejunum and ileum were noted. His post-operative course was uncomplicated, and he was discharged the following day.

Discussion

This case illustrates a classic presentation of ECD: an adult male with long bone involvement (avascular necrosis of the left hip) and diabetes insipidus. Unique to this case was jejunal and ileal involvement with associated small bowel obstruction. Prednisone is recommended for management of ECD, but the patient might have also benefited from INFa, which is the first-line treatment for ECD2. Furthermore, steroid treatment may be contraindicated in ECD patients with GI involvement 3,4.

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OREGON POSTER FINALIST - CLINICAL VIGNETTE Genevieve Benedetti

An Insidious Cause of Pubic Pain in the Prostate Cancer Survivor

Title

An Insidious Cause of Pubic Pain in the Prostate Cancer Survivor

Authors

Genevieve Benedetti, MPP, Oregon Health & Science University, Kristen McClellan, BA, BSN, Oregon Health & Science University, Talia Kahn, MD, MPH, Portland VA Medical Center

Introduction

The incidence of metastatic prostate cancer has been on the rise since 2012 and this growth is expected to continue through 2025.1 As a result, so are its complications. Pubic osteomyelitis is an uncommon but serious complication and is generally seen in those with a history of radical prostatectomy, primary or salvage radiotherapy, and instrumentation of the urinary tract including surgical intervention for bladder neck contractures.2-5 Symptoms include chronic pubic pain, thigh pain, recurrent urinary tract infections, urosepsis, and difficulty with ambulation.2,6

Case Presentation

A 77 year old man with a history of prostate cancer and transitional cell bladder carcinoma presented with two months of worsening pubic pain radiating to the groin and thighs that began after a fall from his truck bed. He has a distant history of radical prostatectomy, radiation therapy, and TURBT with a urethroneocystostomy two years ago. Over the preceding few months, he was treated for multiple urinary tract infections, most recently, *Pseudomonas aeruginosa*. He reported several days of rigors and subjective fevers. He was incontinent of urine at baseline but denied saddle anesthesia or other neurological symptoms. On exam, he was afebrile with stable vitals. There was exquisite point tenderness over the pubic symphysis, but the neurological exam was reassuring. Labs were notable for leukocytosis and elevated CRP and ESR. On MRI, there was a marrow signal abnormality in the region of the pubic symphysis, most suggestive of radiation osteitis/myositis but infection or recurrent tumor could not be excluded. He underwent a bone biopsy and was discharged home given his clinical stability. Bone culture grew pseudomonas and pathology revealed acute osteomyelitis. He was readmitted and CT urogram and cystogram revealed a possible small abscess (<1 cm) but no evidence of fistulization or bladder extravasation. He was started on cefepime and discharged

on a prolonged course of IV antibiotics. Current thinking is that a bladder perforation resulted from his fall two months prior.

Discussion

While MRI is the best imaging study for evaluation of osteomyelitis, the imaging findings are difficult to differentiate from other complications in prostate cancer survivors such as radiation osteitis, secondary malignancy (e.g. sarcoma), or prostate carcinoma recurrence.7 Therefore, if suspicion for osteomyelitis is high, tissue should be sampled. Temporality can also be useful in parsing these etiologies. Insufficiency fractures most commonly occur within the first four months of pelvic radiotherapy.8 In a study of prostate cancer survivors with osteomyelitis, the mean time interval from cancer treatment to osteomyelitis diagnosis was seven years.2 There is no well-established treatment approach for this patient population. In a case series, oral and parenteral antibiotic therapy trials failed in eight out of ten patients prior to pubic surgical debridement.2 All patients in the case series who underwent resection regained full mobility and showed no clinical or radiographic evidence of osteomyelitis.2 Pain management is difficult, as proven in this patient who requires NSAIDs, muscle relaxants and opioids. When pain persists, pubic bone resection has been shown to provide immediate and sustained reduction in pain severity perception.9

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OREGON POSTER FINALIST - CLINICAL VIGNETTE Kristen McClellan

A Rare Cause of Chronic Diarrhea

Title

A Rare Cause of Chronic Diarrhea

Authors

Kristen McClellan, BA, BSN, OHSU; Genevieve Benedetti, MPP, OHSU; Talia Kahn, MD, MPH, Portland VA Medical Center

Introduction

Chronic diarrhea is a common presentation with a diverse differential. In a patient with HIV and multiple myeloma, the differential is even broader. A detailed history, physical exam, and workup can provide valuable insight into the underlying cause.

Case Presentation

A 61-year-old male with a history of HIV, multiple myeloma, and cardiac amyloidosis presented with three months of watery, non-bloody diarrhea and a thirty-pound weight loss. Prior to onset, his multiple myeloma treatment was switched from bortezomib to daratumumab with his diarrhea starting shortly after the change. Therefore, daratumumab was presumed to be the cause of his diarrhea and was discontinued. However, the diarrhea persisted. Stools were large volume and occurred several hours after eating, ceasing with fasting. He described episodes of fecal incontinence, but denied abdominal pain, distention, nausea, vomiting, steatorrhea, mucous, hematochezia, tenesmus, association with certain foods, travel, sick contacts, and antibiotic use. His medication list also included abacavir/dolutegravir/lamivudine and atovaquone. Diarrhea was refractory to trials of loperamide and diphenoxylate/atropine. On physical exam, his vitals were normal. He appeared cachectic with a normal abdominal exam. Labs revealed a CD4 count of 340, HIV viral load >100,000, hypokalemia, hypophosphatemia, hypomagnesemia, hypoalbuminemia, a low vitamin D and an elevated INR. Stool bacterial culture, ova and parasites, Clostridium difficile, and fecal leukocytes were negative. Colonoscopy revealed edematous and friable mucosa throughout the colon and biopsies were consistent with amyloidosis.

Discussion

Chronic diarrhea is common in patients with HIV. The differential is diverse and includes causes related to infection, immunosuppression, medications, and HIV-related complications. In patients with CD4 counts less than 200 cells/mm3, opportunistic infections are more common, and the differential should include Mycobacterium avium complex, CMV colitis, Microsporidium, and Cryptosporidium. This patient had a CD4 count greater than 200 and negative stool studies, so given his history of multiple myeloma, an even rarer diagnosis of gastrointestinal amyloidosis was considered. A detailed history helped differentiate between the three main categories of diarrhea - watery, inflammatory, and malabsorptive. Watery diarrhea is often not related to food intake and is nocturnal. Inflammatory diarrhea is characterized by blood and pus. Common indicators of malabsorption include weight loss, excess gas, association with food, relief with fasting, steatorrhea and lab abnormalities consistent with fat soluble vitamin deficiency, as seen in this patient. Malabsorptive features prompted intestinal biopsy and ultimately led to a definitive diagnosis of gastrointestinal amyloidosis. Gastrointestinal amyloidosis is caused by abnormal protein aggregation of beta-pleated linear sheets that deposit in the gastrointestinal tract and impede normal gut absorption. Diagnosis is confirmed through biopsy with Congo red stain demonstrating apple green birefringence under polarized light. Treatment targets the underlying malignancy usually through chemotherapy or autologous stem cell transplant. Though rare, immunoglobulin derived light chain amyloidosis must be considered in patients with multiple myeloma who present with gastrointestinal symptoms, including weight loss, diarrhea, abdominal pain, nausea, esophageal reflux, gastrointestinal hemorrhage, or malabsorption.

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OREGON POSTER FINALIST - CLINICAL VIGNETTE McKinna Tillotson

A Rare Case of Canine-Caused Infectious Endocarditis: Capnocytophaga canimorsus

Title

A Rare Case of Canine-Caused Infectious Endocarditis: Capnocytophaga canimorsus

Authors

McKinna Tillotson, MSIII, Oregon Health & Sciences University; Nattapron Tun, MD, Oregon Health & Sciences University; Sarah Patel MD, MPH, Oregon Health & Sciences University; Kellie Littlefield, DO, Oregon Health & Sciences University

Introduction

Capnocytophaga canimorsus is a facultatively anaerobic, fastidious, gram-negative bacillus present in the canine flora and is a rare cause of infection in humans resulting from a canine bite. This organism has low virulence for healthy people, and patients with asplenia, cirrhosis, or any immunocompromised state are most susceptible. We report an atypical case of subacute C. canimorsus infective endocarditis.

Case Presentation

A 51-year-old woman with a history significant for seronegative rheumatoid arthritis on prednisone, heart failure with preserved ejection fraction, and rheumatic heart disease with severe mitral stenosis/regurgitations initially presented with shortness of breath. She was found to have a type 2 NSTEMI thought to be related to demand ischemia from severe anemia and decompensated diastolic heart failure due to worsening rheumatic valve disease. On hospital day 12, while undergoing preoperative evaluation for mitral valve replacement surgery, she developed recurrent fevers with fatigue and leukocytosis. Initially, endocarditis was considered unlikely, due to lack of vegetation on prior echocardiogram earlier in admission and blood cultures without growth. However, five days after the initial draw, blood cultures returned positive for gram-negative bacilli, prompting a repeat echocardiogram which displayed a new 1.45x0.5 cm posterior mitral valve leaflet vegetation. CT abdomen displayed evidence of new splenic hypoattenuations concerning for septic embolic infarcts. The patient was started empirically on ceftriaxone. After eight days, speciation resulted positive for Capnocytophaga canimorsus, and antibiotics were switched to IV ampicillin/sulbactam for known beta-lactamase resistance in this species. After being questioned about prior exposure to this rare bacterium, the patient recalled a dog bite two weeks prior to presentation, necessitating 15 stitches. She

also described a month of unintentional weight loss and generalized malaise, consistent with subacute endocarditis. After negative blood cultures, the patient was discharged home on six weeks of IV ertapenem therapy including follow up with cardiothoracic surgery for replacement of mitral valve.

Discussion

This case highlights that although very rare, C. canimorsus endocarditis should be considered in patients with culture-negative endocarditis, particularly in immunosuppressed populations. This patient was on prednisone and had underlying valvular dysfunction. Symptom onset is typically three days after exposure; uniquely, our patient had nonspecific symptoms (weight loss, fatigue, malaise) but no fevers until three weeks after exposure. Additionally, the most common site for endocarditis for this species in the literature is the aortic valve, while our patient had a mitral valve vegetation as well as aortic involvement. Diagnosis in a female is also unusual as 78% of cases of c. canimorsus are male. This atypical presentation emphasizes the importance of thorough history taking to evaluate potential canine exposure, especially in patients with known risk factors. Also, as our patient did not initially have evidence of endocarditis on echo, this case illustrates that it is important to maintain a high level of suspicion in patients with risk factors and clinical signs of endocarditis. C. canimorsus endocarditis has a documented high fatality rate (up to 28 to 31 percent), prompt recognition and treatment are critical.

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PANAMA - POSTER FINALIST - CLINICAL VIGNETTE Luis F Rivera

Atrial Myxoma in Severe Coronary Artery Disease

Title

Atrial Myxoma in Severe Coronary Artery Disease

Authors

Luis Felipe Rivera, MD - Hospital General Cecilio A. Castillero, Panama Roberto Vallarino, MD - Hospital General Rafael Hernandez, Panama Daniel Vallarino, MD - Hospital General de Chepo, Panama

Introduction

Atrial myxomas are benign neoplasms that originate from primitive mesenchymal cells from subendocardial tissue. They are most frequently located at the left atrium and roughly represent between 50 and 70% of all primary cardiac tumors. It affects more women than men. A simultaneous presentation of both an atrial myxoma and coronary artery disease is unusual and it affects both operative course and management of both entities.

Case Presentation

A 52-year-old male from the province of Panama presents to the emergency department with a 10 month history of dyspnea at moderate exertion and palpitations at rest. He has been receiving treatment for both hypertension and paroxistical atrial fibrillation during the last 10 years preceding this presentation. He denied any family history. During the physical examination, the temperature was 37.0ºC, the pulse was 72 beats per minute, the blood pressure was 110/70 mmHg, and cardiac auscultation revealed an irregular rhythm, but without any murmurs. There was also no venous jugular distention, or facial or lower extremity edema. Electrocardiography at admission revealed sinus bradycardia, signs of left atrial enlargement and nonspecific repolarization abnormalities in the lateral and inferior leads. Transthoracic echocardiography revealed a preserved segmentary and global mobility of the left ventricle, an ejection fraction of 65%, and an 6.48 x 3.80 cm mass of smooth, regular borders that occupied approximately 60% of the total left atrial volume, that protruded towards the left ventricular outflow tract. A coronary angiography was then performed, which revealed a 90% stenotic lesion at the bifurcation of the left anterior descending artery and its first diagonal branch, a 90% stenosis of the proximal right coronary artery, and an intracardiac mass. Due to the severity of the vessels' occlusion and the presence of a concomitant intracardiac mass, it is decided to perform a simultaneous coronary revascularization and total resection of the mass.

The postoperative histopathologic report confirmed the diagnosis of an atrial myxoma, with dimensions of 7.0 x 3.5 x 4 cm.

Discussion

Patients that present both an atrial myxoma and cardiovascular disease can overlap in age and clinical presentation, sometimes overlooking a concomitant coronary artery disease in these type of patients. Retrospective cohort studies have encountered that when coronary angiography is performed preoperatively in patients with intracardiac tumors, silent coronary artery disease can be present , thus modifying the technical and postoperative aspects of the treatment in this population.

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PENNSYLVANIA POSTER FINALIST - CLINICAL VIGNETTE
Jonathan Baron

ROS-1 Mutation: Driving Lung Cancer in Young, Healthy Non-smokers

Title

ROS-1 Mutation: Driving Lung Cancer in Young, Healthy Non-smokers

Authors

Jonathan Baron, BS; Tiffany Dharia, MD. Department of Internal Medicine, University of Pennsylvania.

Introduction

Lung cancer continues to be the leading cause of cancer worldwide, with non-small cell lung cancers (NSCLCs) accounting for an estimated 85% of all lung cancer types. Several key driver gene mutations have been identified in NSCLCs, which have allowed for more accurate classification and improved treatment options based on each specific mutation. Recently, chromosomal rearrangements involving ROS-1, a receptor tyrosine kinase of the insulin receptor family, have been found and defined as driver mutations in 1-2% of all NSCLCs1. ROS-1 mutations have a higher prevalence in younger patients who are never-smokers with a new diagnosis of adenocarcinoma2. These rearrangements are defining a unique class of patients who otherwise have a low likelihood of developing lung cancer, associated with high morbidity.

Case Presentation

A 45 year-old Cambodian female with no past medical history presented to the clinic with a mild cough. Her medical history was notable for never smoking, occasional alcohol use, and no recreational drug use. She had no known occupational exposures and no family history of malignancy. Initial treatment for gastroesophageal reflux disease and asthma were ineffective. Chest x-ray revealed a left lower lobe infiltrate concerning for a pneumonia which did not resolve with antibiotics. The patient had worsening fatigue and shortness of breath over the course of the month. CT Chest showed bilateral pulmonary emboli, pleural effusions, mediastinal and hilar lymphadenopathy and pericardial effusion. She was admitted to the hospital and initiated on heparin for anticoagulation. Fluid cytology from thoracentesis revealed poorly differentiated adenocarcinoma of pulmonary origin. She developed heaviness in her left arm with no focal deficits on neurologic exam. Subsequent MRI of her brain showed no metastases but multiple subacute to acute strokes. Her course was complicated by acute respiratory failure requiring BiPAP with resolution after bilateral catheter drainage placement.

FISH analysis was positive for ROS-1 rearrangement and negative for ALK3 and EGFR mutations. She was promptly started on crizotinib and discharged home for continued outpatient follow-up with oncology.

Discussion

This case depicts a young Asian female who never smoked with rapid progression of newly diagnosed adenocarcinoma within two months of symptom onset. EGFR mutations are commonly tested in Asian patients with new NSCLC but ROS-1 rearrangements encompass a newer, small, yet highly relevant subgroup of NSCLCs. The recent approval for crizotinib for the treatment of this type of lung cancer has been associated with substantial and durable responses3, which highlights the need to identify and test for this mutation regularly. As demonstrated by this case report, this type of lung cancer can present in young, healthy, never smokers with no family history with nonspecific symptoms such as a cough. A high level of suspicion must therefore be maintained by physicians in order to identify low-risk patients with ROS-1 positive NSCLC in order to prevent a delay in treatment and further complications as witnessed by this patient's bilateral pulmonary emboli, malignant pericardial effusion and several strokes.

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PENNSYLVANIA POSTER FINALIST - CLINICAL VIGNETTE Brett Curtis

Nervous about myopathy? A Confusing Case of Hyperacute-onset Acute Inflammatory Demyelinating Polyneuropathy

Title

Nervous about myopathy? A Confusing Case of Hyperacute-onset Acute Inflammatory Demyelinating Polyneuropathy

Authors

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Introduction

Guillain-Barre syndrome (GBS) classically presents with bilateral ascending muscle weakness and hyporeflexia. However, atypical symptoms can confound diagnosis.

Case Presentation

A 79-year-old man, without medical history, presented after overnight onset of proximal muscle weakness and inability to ambulate. He had exercised the previous day. Over two days, he developed dysphagia and could not lift his arms above his head. He denied recent illness. Physical exam was notable for diminished vibration and pain in bilateral lower limbs and 0 to 1+ deep tendon reflexes throughout all extremities without myalgias. CBC/BMP were unremarkable. Notable labs included elevated creatinine kinase 274 U/L (30-170 U/L), lactate 2.4 mmol/L (0.67-1.8 mmol/L), and troponin 0.33 µg/L (0-0.5 µg/L). An infectious workup including COVID, HIV, tetanus, and Lyme was negative. Family was unaffected. A lumbar puncture revealed normal to mild protein elevation 45 mg/dL (15-60 mg/dL). Head and spine imaging were unremarkable. Transthoracic echocardiogram (TTE) showed left ventricular ejection fraction (EF) of 20-25% and wall motion abnormalities of the apex and anterolateral, anteroseptal, and inferoseptal walls. Electromyography (EMG) suggested an axonal demyelinating polyneuropathy but was interpreted as not diagnostic of GBS. Empirically, he received 2 doses of IVIG at 0.4 mg/kg for presumed GBS without improvement and was

transferred to our institution. Extensive work-up for autoimmune causes was negative. Repeat EMG confirmed a sensorimotor polyneuropathy with demyelination without myopathic components, confirming acute inflammatory demyelinating polyradiculopathy, a GBS subtype. Cardiac MRI with gadolinium showed diffuse hypokinesis and a complete lack of infarction, scarring, or infiltrate, suggesting potential for functional recovery. Guideline directed medical therapy with angiotensin-converting enzyme inhibitors and beta-blockers was initiated for non-ischemic cardiomyopathy with reduced EF. Mild dysarthria with silent aspiration on modified barium swallow required a nasogastric tube for nutrition. Eventually, he reported receiving a double dose influenza vaccine 2 weeks prior to symptom onset. He resumed IVIG to complete 5 total days of treatment and displayed improvement within 1 week of completion. He was transferred to inpatient rehabilitation 15 days after symptom onset.

Discussion

This case illustrates an unusual presentation of GBS and the need to rapidly initiate appropriate treatment. Proximal weakness in GBS remains atypical. Rapid progression from full function to profound weakness is also uncharacteristic, as maximum disability typically takes weeks to develop (1). Reports of acute rhabdomyolysis from GBS exist but mechanism of myocyte injury is unclear (2). Up to two thirds of patients suffer cardiovascular complications, including rhythm abnormalities and acute coronary syndromes. Myocardial involvement ranges from asymptomatic cardiomyopathy to fulminant heart failure and appears reversible without sequelae. Cardiomyopathy in GBS appears rare and incidence remains unknown. Proposed mechanisms for GBS-related cardiomyopathy include autonomic and nervous dysfunction from immune-mediated nerve damage (3). The temporal association between influenza vaccination and GBS is well reported. However, little evidence supports a causal relationship between vaccines and GBS, and it is unclear if a double-dose vaccination confers greater risk (4). Mainstay of treatment for GBS is prompt IVIG infusion. Clinicians should be aware that acute onset of proximal weakness, myositis, and cardiomyopathy are atypical features of GBS.

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PENNSYLVANIA POSTER FINALIST - CLINICAL VIGNETTE Lindsay Goldblatt

Sweating Out the Cause of Unilateral Mydriasis - A Unique Case

Title

Sweating Out the Cause of Unilateral Mydriasis - A Unique Case

Authors

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Introduction

This case report describes a patient who had an extensive and costly workup for episodic and alternating unilateral mydriasis in order to exclude a life-threatening cause. Through a proper medicine reconciliation, it was eventually discovered that the patient had recently been prescribed a newly FDA approved deodorant wipe containing an ingredient whose mechanism of action is well known to cause mydriasis with ocular contamination. A thorough history and clinician familiarity with this medication would have hastened this diagnosis and avoided an unnecessary medical workup.

Case Presentation

A 26-year-old female with no relevant past medical history presented to the emergency department with unilateral mydriasis, bilateral frontal headache, and blurry vision. The symptoms started earlier in the day after a morning workout but were attributed to stress and eye strain. She denied any recent changes in medications or trauma. Family history was negative for strokes or clotting disorders. Upon evaluation, there was left pupil mydriasis (8mm) with a sluggish reaction to light and accommodation. Extraocular movements and all other cranial nerves were intact. Her NIH stroke score was 0. A STAT non-contrast Head-CT and CT-angiogram were performed which revealed no abnormalities. The presumed diagnosis made by a neurologist was an atypical migraine. The patient was discharged home and the pupil returned to normal within 24 hours. In the subsequent two months, the patient reported three additional episodes of acute mydriasis in alternating eyes. The patient was referred to a neuro-ophthalmologist, who diagnosed her with bilateral Adie's Pupil, an idiopathic benign condition

caused by damage to the ciliary nerves, which required no further workup. A further personal review by the patient revealed the first incident occurred soon after she had been prescribed glycopyrronium tosylate (Qbrexza), a prescription medication pad applied topically at night to reduce underarm sweating. The primary active ingredient, glycopyrronium, is an anticholinergic agent that blocks the muscarinic receptors at the neuromuscular junction. Contamination to the pupillary sphincter would cause mydriasis by blocking the signal to contract the pupillary sphincter muscle. The patient had not disclosed the use of these pads due to both sporadic uses and because she did not consider medicated pads to be a “real” medication. Discontinuing the use of these pads resulted in no further episodes of mydriasis for the next year.

Discussion

An important lesson to be learned from this case is the value of taking a complete history in order to prevent extensive and costly workups, referrals to numerous specialists, and ultimately frequently delayed diagnosis. Thorough medication reconciliation that includes topical prescriptions may save patients time, cost, and medical risk associated with more extensive workup. Furthermore, if providers are unaware of new medications such as glycopyrronium tosylate, they may be unable to include these on their differential diagnoses to guide questioning and decision making. Case reports such as this one help not only serve as a reminder of the importance of a thorough history but also improve awareness of a potentially under-recognized but not uncommon medication side effect.

PENNSYLVANIA POSTER FINALIST - CLINICAL VIGNETTE
Madeline Hooper

Masquerade of Marauders: Sweet Syndrome, Zoster, and Hepatitis C

Title

Masquerade of Marauders: Sweet Syndrome, Zoster, and Hepatitis C

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Introduction

Sweet syndrome (SS) is a febrile neutrophilic dermatosis often associated with infection, malignancy, and medications.[1-7] Defined by the acute eruption of painful inflammatory skin lesions with mucocutaneous involvement, SS can also affect the central nervous system and viscera.

This report describes a corticosteroid-refractory case of bullous SS with equivocal evidence regarding its underlying etiology. We also discuss the complications of varicella zoster (VZV) and hepatitis C (HCV).

Case Presentation

A 75-year-old man with a history of end stage renal disease and untreated HCV presented with a hemorrhagic, necrotic rash on his face with tense, hemorrhagic bullae in his mouth and on his arms and legs. His allergies included piperacillin-tazobactam, ciprofloxacin, and metronidazole. Prior to admission, the patient presented to an outside hospital with fever and encephalopathy concerning for infection of a sacral wound. He received intravenous cefepime, levofloxacin, and vancomycin.

Subsequently, a vesicular rash erupted on the patient's face and arms. Per concern for Stevens-Johnson syndrome/toxic epidermal necrolysis (SJS/TEN), he was transitioned to aztreonam and tigecycline. The rash worsened despite treatment with intravenous immunoglobulin (IVIG),

methylprednisolone, and acyclovir. Differential diagnoses considered were SJS/TEN, SS, paraneoplastic pemphigoid, and polyarteritis nodosum.

On admission, the rash and bullae totaled approximately 10% body surface area (BSA) with oral involvement. Nikolsky sign was negative. He was hemodynamically stable, afebrile, anemic, and thrombocytopenic. Burn and Dermatology consults favored the diagnosis of bullous Sweet syndrome. All antibiotics, acyclovir, and IVIG were discontinued; high-dose methylprednisolone was continued and hydrocortisone and triamcinolone ointments were initiated. Infectious, inflammatory, and malignancy workups were ordered. Punch biopsy of the scalp showed diffuse dermal neutrophilic infiltrate consistent with SS.

The rash rapidly progressed to involve minimally 30% BSA with larger, more numerous bullae by day 3. Leukocytosis with neutrophilia was noted. Blood cultures, HIV 1/2, and HSV were negative. Serology indicated elevated HCV viral load, ANA, and anti-Ro antibodies. Direct fluorescent antibody test was positive for VZV and acyclovir was restarted for possible disseminated VZV reactivation. The patient died on day 10 from medical complications.

Discussion

Bullous SS is a rare subtype that manifests with neutrophilic bullous lesions instead of the more common papules and plaques. At diagnosis, the suspected trigger(s) of this patient's SS included contrast dye, hydralazine, and/or antibiotics. Occult hematologic malignancy was considered; his age, anemia, thrombocytopenia, and absence of arthralgias were consistent with previous literature linking SS and malignancy.[4, 8] Least likely was an inciting respiratory infection.

As Endo et al described bullous SS in which HSV appeared to trigger the syndrome in a dermatomal pattern, it is also possible the SS was caused by VZV that was incorrectly identified at first presentation.[9] Moreover, the literature cites three cases of SS in the setting of HCV that resolved after steroid treatment.[10-12] No data clarify if the relationship between this patient's HCV, autoimmunity, and SS was causal or benign.

Unique to our case is its myriad possible etiologies. Because SS may not regress without treatment of the underlying cause, elucidating the precipitating event remains important on a case-by-case basis. This element of SS management requires further study.

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PENNSYLVANIA POSTER FINALIST - CLINICAL VIGNETTE Mary B White

An Unfortunate Case of Spontaneity: Spontaneous Pneumothorax in the Setting of Septic Pulmonary Emboli

Title

An Unfortunate Case of Spontaneity: Spontaneous Pneumothorax in the Setting of Septic Pulmonary Emboli

Authors

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Introduction

Native-valve infective endocarditis (IE) has a low incidence in the United States with 2 to 10 cases per 100,000 person-years. Staphylococcal Aureus is the most frequent cause of IE with Methicillin-Resistant Staphylococcal Aureus (MRSA) rates increasing. MRSA IE has a high mortality rate with studies citing 30-56%. IE confers the risk of multiple complications, such as valvular destruction, microvascular and large-vessel embolization, metastatic infection, and immunologic phenomenon. Spontaneous pneumothorax from septic pulmonary emboli (SPE) in IE is a rare, but life-threatening, complication only described in case reports. This case illustrates the importance of maintaining a high index of suspicion for pneumothorax in patients with known SPE and increasing oxygen requirements to ensure early diagnosis and intervention.

Case Presentation

A 42-year-old male with a history of intravenous drug use presented to the emergency department with hematemesis, diffuse pain, and loss of appetite. He presented with similar symptoms five days prior and was diagnosed with MRSA bacteremia; however, he left against medical advice. On exam, he appeared cachectic with tachypnea, rigors, bilateral necrotic lower extremities, and track marks. He developed acute hypoxemic respiratory failure and septic shock, requiring intubation and admission to the Medical Intensive Care Unit. A computed tomography of the chest revealed SPE and cavitations. A transesophageal echocardiogram demonstrated a large tricuspid valve vegetation with moderate tricuspid regurgitation. He met the Duke Criteria for MRSA IE and was treated with vancomycin and ceftaroline. His course was complicated by acute renal failure requiring hemodialysis. Nine days into admission, the patient developed worsening hypoxemia and increased work of breathing despite increasing FiO2 supplementation. A chest x-ray showed a seven centimeter right sided pneumothorax. A 28-French chest tube was emergently placed at beside and placed on suction with immediate return of 1.2 liters of blood. The patient's oxygenation requirement and agitation improved immediately after placement of the chest tube.

Discussion

This case helps to demonstrate a rare complication of right-sided IE. SPE can occur from microvascular thrombi from IE, specifically, a tricuspid valve vegetation. Although the exact pathophysiology is unknown, it is presumed that SPE cause pulmonary infarctions and cavitations leading to a high risk of rupture, rarely, resulting in a spontaneous pneumothorax. In this scenario, there was no tension component, so the patient's hemodynamics and airway pressures remained stable, making diagnosis challenging. The presenting sign of an acute process was

the patient's acute hypoxia and agitation. Clinicians should have a high suspicion for spontaneous pneumothorax when a patient acutely decompensates in the setting of right-sided IE with SPE. Although this is a rare complication, prompt diagnosis and intervention can improve patient outcomes. More studies with increased numbers of patients should be performed to understand the risk factors, presentation, pathophysiology, and optimal treatments.

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RHODE ISLAND POSTER FINALIST - CLINICAL VIGNETTE Fadwa Ahmed

Sweet's syndrome in the setting of newly-initiated risankizumab therapy for psoriasis

Title

Sweet's syndrome in the setting of newly-initiated risankizumab therapy for psoriasis

Authors

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Introduction

Sweet’s syndrome (acute febrile neutrophilic dermatosis) is a rare disorder of unclear etiology characterized by painful cutaneous lesions sometimes accompanied by systemic symptoms. It has been associated with a number of autoimmune conditions, drugs, malignancies, and infections, though many cases are idiopathic. We describe a rare case of Sweet's syndrome in a 49-year-old male with preexisting psoriasis following recent initiation of risankizumab therapy.

Case Presentation

A 49-year-old man with a history of plaque psoriasis presented with a five-day history of acute-onset, rapidly developing non-pruritic skin lesions. The first lesion appeared on his right ankle and subsequently spread to both arms, legs, back, and ears. His exam was notable for diffuse 1 to 2 cm annular necrotic ulcerations, surrounded by erythema and edema (see figures). His medical history was most notable for severe plaque psoriasis, for which he was in the middle of induction therapy with Risankizumab-rzaa, an IL-23 inhibitor. His last dose was approximately six weeks prior. He denied associated symptoms, including fever, respiratory symptoms, gastrointestinal symptoms, and joint pain. Exposure history was notable for sex with a longstanding male partner, but no travel, pets, sick contacts, or new allergens. He was initially started on broad spectrum antibiotics for possible ecthyma gangrenosum, but bacterial, fungal, and viral cultures of the lesions were all negative. Biopsy samples collected from lower extremity, upper extremity, and trunk skin lesions all revealed neutrophilic infiltrates in the superficial and mid-dermis with neutrophilic and histiocytic perivascular infiltrates, and associated endothelial swelling. Diagnosis of Sweet's Syndrome was made, and he was started on 120 mg of prednisone daily. Upon initiation of high-dose steroid therapy, the patient’s condition improved rapidly and he was discharged home two days later.

Discussion

Sweet's syndrome is a rare disorder characterized clinically by the abrupt onset of painful, erythematous skin lesions, often consisting of plaques, papules, and/or nodules, and histopathologically by the presence of neutrophilic infiltrate in affected dermis. Drug-induced Sweet's syndrome has been well-described, particularly in association with granulocyte colony-stimulating factor. Several other drugs have been reported in association with

Sweet's syndrome, including TNF-alpha inhibitors. However, to our knowledge, there are no other reports of Sweet's syndrome in the setting of recently initiated IL-23 inhibitor therapy. Such drug reactions are deemed "paradoxical" due to their correspondence with conditions which, in their idiopathic forms, have been effectively treated with the very biologic agents that appear to incite them. While the pathogenesis of such paradoxical reactions to biologic agents remains a matter of ongoing investigation, hypotheses include biologic agent-induced cytokine imbalance and/or shifts in cellular response patterns in addition to baseline T-cell dysfunction (potentially overlapping with preexisting rheumatologic conditions, such as psoriasis).1 With the ever-expanding use of existing and development of new biologic agents, clinicians should maintain vigilance in surveilling for adverse events, especially those which are new or sparsely-described.

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RHODE ISLAND POSTER FINALIST - CLINICAL VIGNETTE Clara Mao

Fifth Time's A Charm: A Case of HHV-8-Associated Multicentric Castleman Disease

Title

Fifth Time's A Charm: A Case of HHV-8-Associated Multicentric Castleman Disease

Authors

Clara Mao MS3, Jaclyn McKenna MD, Sean O'Neill MD, Habibe Kurt MD, Kate Cahill MD

Introduction

Multicentric Castleman disease (MCD) is a rare lymphoproliferative disorder associated with a broad spectrum of systemic inflammatory symptoms, making careful clinicopathologic correlation particularly important for diagnosis [1]. We report the case of a 67-year-old man presenting with diffuse lymphadenopathy, fatigue, and dyspnea who was diagnosed with HHV-8-associated MCD after four previously unremarkable lymph node biopsies.

Case Presentation

A 67-year-old man with a past medical history of paroxysmal supraventricular tachycardia and diffuse lymphadenopathy presented with two weeks of worsening dyspnea, palpitations, fatigue, and fever. Over the last two years, he had been experiencing worsening lymphadenopathy, recurrent episodes of generalized fatigue and night sweats, and a 30-pound unintentional weight loss. One year prior to admission, the patient had a PET CT demonstrating extensive lymphadenopathy. Three core needle lymph node biopsies and one excisional lymph node biopsy were notable only for lymphoid hyperplasia suggestive of reactive changes. On arrival, the patient was hypotensive, tachycardic, and tachypneic but stabilized with supplemental oxygen and intravenous fluids. Physical exam was notable for enlarged rubbery, non-tender, mobile lymph nodes in the cervical, submandibular, axillary, and inguinal regions. Initial labs were significant for WBC 7.9 x 10^9/L, hemoglobin 10.4 g/dL, platelets 236 x 10^9/L, total protein 8.1 g/dL, albumin 2.7 g/dL, D-dimer 869 ng/mL, and BNP 205.6 pg/mL. CT pulmonary angiogram showed splenomegaly and diffuse mediastinal, hilar, and axillary lymphadenopathy increased from previous studies. The patient's hospital course was complicated by nocturnal fevers which were often associated with transient episodes of supraventricular tachycardia. A broad hematologic, infectious, and rheumatologic workup was pursued for fever and diffuse lymphadenopathy. CT abdomen pelvis showed extensive

abdominal and inguinal lymphadenopathy with trace pericardial effusion. The patient had recently tested negative for HIV, tuberculosis, and treponema. He had elevated inflammatory markers with ESR 116 mm/h, CRP 126 mg/L, ferritin 1080 ng/mL, and LDH 282 IU/L. These markers–along with the patient's history of non-specific systemic symptoms, lymphadenopathy, splenomegaly, anemia, and hypoalbuminemia–raised suspicion for Castleman disease. As part of the workup, HHV-8 qPCR viral load was found to be elevated at 410,000 copies/mL, with an IL-6 level of 10.76 pg/mL. A repeat excisional inguinal lymph node biopsy was performed, this time with immunohistochemistry using a monoclonal antibody stain specific for latency-associated nuclear antigen-1 (LANA-1), which is encoded by HHV-8. Pathology was consistent with HHV-8-positive MCD, plasma cell variant. The patient was started on rituximab after discharge from the hospital.

Discussion

This case demonstrates the need for a broad differential in the diagnosis of MCD, whose presentation may overlap with a number of infectious, autoimmune, and neoplastic processes. With histopathologic findings that include largely preserved lymph node architecture and reactive lymphoid hyperplasia, additional immunohistochemical studies to detect HHV-8-associated MCD may be overlooked in the absence of explicit clinical suspicion [2]. Furthermore, symptoms consistent with MCD in the absence of HHV-8 qPCR positivity should still trigger consideration of excisional lymph node biopsy to evaluate for HHV-8-negative/idiopathic MCD [3].

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SOUTH CAROLINA POSTER FINALIST - CLINICAL VIGNETTE
Phillip G Garrison

Hurricane, Zoonosis, and Renal Failure

Title

Hurricane, Zoonosis, and Renal Failure

Authors

Phillip G. Garrison, Michael G. Janech, Juan Carlos Q. Velez, Mohammed Alzubaidi

Introduction

Leptospirosis is a zoonosis caused by an obligate aerobic spirochete where rodents serve as a major reservoir host. Transmission to humans occurs through direct contact with bodily fluids of infected animals or through indirect contact from contaminated water. In tropical countries, leptospirosis is more prevalent, with outbreaks occurring during the rainy season, coinciding with flooded areas. However, it is less common in the USA. Herein, we describe a case of severe AKI associated with Hurricane Maria and due to leptospirosis.

Case Presentation

A 52-year-old resident of St. Thomas, US Virgin Islands was transferred to the US mainland for medical evacuation. He was a survivor of Hurricane Maria one week prior. He presented with one week of chills, rigors, nausea, and abdominal pain. He reported drinking untreated water and sleeping soaking wet with no dry clothes. Examination was remarkable for scleral icterus, conjunctival suffusion, and epigastric tenderness. Laboratory data showed: leukocyte count 12,300/µl, platelets 44,000/µl, Na 133 mEq/L, K 2.4 mEq/L, serum creatinine (sCr) 7.1 mg/dL, BUN 61 mg/dL, alkaline phosphate 175 U/L, ALT 30 U/L, AST 32 U/L, total bilirubin 13.8 mg/dL, direct bilirubin 11.5 mg/dL and CK 175 U/L. Urinalysis was positive for urobilinogen. Abdominal sonogram was unremarkable. Given strong suspicion for leptospirosis, he was started on penicillin, ceftriaxone and doxycycline. Serum and urine were positive for leptospiria by PCR. The hospital course was complicated by pulmonary hemorrhage and severe ARDS necessitating hemodialysis for volume overload. Patient subsequently responded to antimicrobial therapy and his sCr on discharge was 0.8 mg/dL.

Discussion

Renal involvement in leptospirosis includes tubulointerstitial nephritis from inflammation and direct tubular injury from leptospira, as well as pigment-nephropathy due to hyperbilirubinemia and rhabdomyolysis. Hypokalemia is a frequent finding in leptospirosis AKI due to a decrease of potassium tubular reabsorption in the damaged proximal epithelia and to an increased distal secretion resulting from increased distal sodium delivery. Within a region afflicted by a hurricane, a triad presentation in acutely ill patients with fever, jaundice, and hypokalemic AKI should alert the clinician of possible leptospirosis.

TENNESSEE POSTER FINALIST - CLINICAL VIGNETTE Christine Joyce

Hyperbaric Oxygen Therapy-Induced Seizures in Patients on Tramadol: A Case Series

Title

Hyperbaric Oxygen Therapy-Induced Seizures in Patients on Tramadol: A Case Series

Title

Hyperbaric Oxygen Therapy-Induced Seizures in Patients on Tramadol: A Case Series

Authors

Christine Joyce, BS; Zach Poindexter, EMT; Michael Freeman, MD; Mitchell Goldman, MD; Daphne Norwood, MD?

Authors

Christine Joyce, BS; Zach Poindexter, EMT; Michael Freeman, MD; Mitchell Goldman, MD; Daphne Norwood, MD

Introduction

Tramadol is an analgesic used for pain management. At therapeutic levels there is a low incidence of seizures; however, at higher doses tramadol inhibits gamma-aminobutyric acid (GABA), inducing seizures. Hyperbaric oxygen therapy (HBOT) works by increasing the atmospheric pressure while allowing the patient to breathe 100% oxygen. It is frequently utilized for treatment of non-healing wounds but can be used for a variety of other medical problems. Seizures on HBOT are thought to be related to oxygen toxicity and lowering the seizure threshold. Occurrence of seizures at our institution when administering HBOT is less than 1%. Between January and December of 2019, two patients had seizures at our institution, both of which were on tramadol. Therefore, we hypothesize that tramadol is a contributing factor to developing seizures while undergoing HBO2 therapy. This paper addresses various commonalities and differences between three patients on Tramadol to determine the hazards of developing a seizure for patients receiving HBOT while on Tramadol.

Introduction

Tramadol is an analgesic used for pain management. At therapeutic levels there is a low incidence of seizures: however, at higher doses tramadol inhibits ?-aminobutyric acid (GABA) can induce seizures.? Hyperbaric oxygen (HBO2) therapy works by increasing the atmospheric pressure while allowing the patient to breathe in 100% oxygen. This treatment is frequently utilized in wound healing centers for treatment of non-healing wounds but can also be used for a variety of other medical problems.? Seizures on HBO2 therapy are thought to be related to oxygen toxicity and lowering the seizure threshold. Occurrence of seizures at our institution when administering HBO2 therapy is less than 1%. In the last twelve months two out of three patients on tramadol had seizures while receiving HBO2 therapy in our wound care center. Therefore, we hypothesize that tramadol is a contributing factor to developing seizures while undergoing HBO2 therapy. This paper addresses various commonalities and differences between these three patients to determine the hazards of developing a seizure for patients receiving HBO2 therapy while on tramadol.

Case Presentation

The first patient is a 70-year-old Caucasian female with a non-healing lower GI tract wound following radiation for vaginal cancer (Patient A). This patient started on 50 mg of Tramadol two times a day as needed three months prior to initiation of HBOT. She completed 53 HBOT sessions at 2.5 ATA for 90 minutes with two 5-minute air breaks. During her 54th session, she had a tonic-clonic seizure which lasted for three minutes. She then proceeded to have a second seizure which lasted three minutes, after which she reached a postictal state. The second case is a 73-year-old Caucasian man with osteoradionecrosis of the mandible (Patient B). The patient was initially treated with 30 rounds of HBOT at a pressure of 2.5 ATA for 90 minutes with two 5-minute air breaks. While receiving HBOT, he was on 50 mg of Tramadol three times a day as needed. He then had a six-month break from HBOT, after which time he resumed treatment. Approximately 65 minutes into his second session (32nd overall), the patient had a tonic-clonic seizure which lasted for one minute. The last case is a 49-year-old African American female with a non-healing diabetic leg ulcer (Patient C). The patient was treated with 30 rounds of HBOT at a pressure of 2.0 ATA for 90 minutes without air breaks. She was prescribed 50 mg of tramadol twice daily as needed three months prior to initiation of therapy. The patient continued to receive this medication throughout her treatment course and never experienced a seizure.

Discussion

Our observation that the only patients at a single hyperbaric oxygen treatment center to seize were also on tramadol suggests that there is an association. Reviewing our clinical cases and the literature, it may be that patients receiving over 30 treatments of HBOT may be a higher risk for seizure induction. The use of tramadol as a pain medication for patient who require HBOT for poorly healing wounds may confer unnecessary risk.

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TEXAS POSTER FINALIST - CLINICAL VIGNETTE Naba Asif

Got Milk...Alkali Syndrome?

Title

Got Milk...Alkali Syndrome?

Authors

Naba Asif

Introduction

Milk alkali syndrome is a form of hypercalcemia caused by excessive calcium intake. Symptoms include hypercalcemia, metabolic alkalosis, and acute kidney injury3. Milk alkali syndrome was considered a rare cause of hypercalcemia due to the emergence of histamine blockers in the 1970s and reduced need for antacids to treat peptic ulcer disease. However, new cases arise due to the widespread use of calcium supplements among elderly patients and postmenopausal women1.

Case Presentation

A 69-year-old male with past medical history of renal cell carcinoma- status post right-sided nephrectomy, cerebrovascular accident, and benign prostatic hyperplasia presented to the hospital with severe constipation for 1 week. Additional symptoms included nausea, vomiting, and increased urinary frequency. The patient denied any abdominal pain, dysuria, fever, or chills. Upon admission, pertinent laboratory results showed creatinine: 2.9 (0.55 – 1.30 mg/dL), GFR: 32, calcium level: 14.7 (8.2 – 10 mg/dL), albumin: 3.4 (3.4-4.7 g/dL), and alkaline phosphatase: 392 (38-136 units/L). CT of the abdomen revealed large amounts of fecal matter in the colon and diverticulosis. Urinalysis showed elevated leukocyte esterase, nitrites, and WBC count. The patient was not taking any calcium-sparing drugs such as thiazide diuretics, vitamin A, or lithium. He was started on IV normal saline with a subsequent calcium level of 14.1 mg/dL. Out of concern for malignancy, extensive lab work was performed and showed gamma glutamyl transferase of 753 (5-83 units/L), ionized calcium: 1.67 (1.12- 1.32 mmol/L), PTH intact: 8.7 (14.6 – 101.3 pg/mL), 1,25- vitamin D: 73.6 (19.9-79.3 pg/mL), 25 vitamin D: 33.5 (30-100 ng/mL), and PTH-related peptide:

Discussion

The patient's past medical history of renal cell carcinoma and old age was highly suggestive of cancer recurrence. This complicated the diagnosis of milk alkali syndrome and led to extensive laboratory work and imaging. The name "milk-alkali syndrome" can be misleading as calcium carbonate has replaced milk as a leading cause of hypercalcemia2. Updating guidelines to replace the name with calcium alkali syndrome and to rate milk alkali syndrome higher on a list of differential diagnoses might encourage physicians to consider the condition even in the face of severe hypercalcemia and potentially reduce health care costs.

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TEXAS POSTER FINALIST - CLINICAL VIGNETTE Brooke A Burgess

Acute Cerebellitis and Intracranial Hypertension in a Young Woman Following a Viral-like Illness

Title

Acute Cerebellitis and Intracranial Hypertension in a Young Woman Following a Viral-like Illness

Authors

Brooke Burgess, MS1; Jamael Thomas, MD, MPH2

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Introduction

Acute cerebellitis (AC) is a rare auto-inflammatory condition that usually occurs in children. Most cases are mild and have full functional recovery. AC is much less common in adults in whom it is often more severe and associated with an increased likelihood for long-term sequelae and fatality. We report a case of a 20-year-old woman who developed acute cerebellar dysfunction. Imaging revealed cerebellitis complicated by intracranial hypertension (ICH) and obstructive hydrocephalus. She required emergent ventriculostomy and posterior fossa decompression.

Case Presentation

A 20-year-old African American woman developed “mono-like symptoms” 1-month prior to presentation with a 1-week history of headache, blurry vision, and intractable vomiting. Physical exam demonstrated dysmetria with pronounced ataxia. MRI: cerebellar edema and leptomeningeal enhancement complicated by early ascending transtentorial cerebellar and descending tonsillar herniations with mild mass effect on the brain stem. This was indicative of AC with ICH. Laboratory tests: positive mycoplasma serum IgG, HSV-1, and EBV. No lumbar puncture was done due to herniation risk. Cerebral angiogram/venogram showed stable AC with narrowing of the bilateral sigmoid sinuses with an elevated pressure gradient. This is commonly seen in idiopathic ICH. The patient was treated with acyclovir, moderately dosed methylprednisolone, dexamethasone, and acetazolamide but cerebellar signs worsened despite

aggressive medical management of ICH. A repeat CT demonstrated new obstructive hydrocephalus of the 3rd and bilateral lateral ventricles with interval increase in cerebellar edema. An emergent posterior fossa decompression and ventriculostomy with external ventricular drain placement was performed. High dose pulse methylprednisolone was administered. Extensive cerebrospinal fluid analysis including bacterial and viral panels were nondiagnostic. The patient slowly improved. Serial CTs showed progressive decrease in ventricular size. Her intracranial pressure stabilized and clinical status gradually improved. She was discharged to inpatient rehabilitation. She subsequently was tapered off steroids, experienced motor and cognitive functional recovery and was discharged.

Discussion

The diagnosis of acute cerebellitis requires recognition of clinical symptoms and appropriate CNS imaging studies. MRI is the preferred modality and may show leptomeningeal enhancement, cerebellar edema, and/or obstructive hydrocephalus in more severe cases. Identification of the etiology requires CSF culture and analysis of cells/protein and serum studies searching for autoantibodies, or antibodies to various pathogens. Cerebellar biopsy may show leptomeningeal inflammation and meningoencephalitis. Therapy is guided by both clinical severity and etiologic identification. Infectious causes must be promptly treated with appropriate antimicrobial/viral medication. Mild, noninfectious cerebellitis can be treated with moderate dose glucocorticoid therapy and often results in full recovery. If fulminant disease with cerebellar swelling, herniation, and/or hydrocephalus occurs, emergent surgical intervention may be required. As occurred in this patient, ventriculostomy and posterior fossa decompression was necessary to prevent herniation and death. Long-term complications including cerebellar atrophy and persistent imaging abnormalities have been described. Most patients with severe acute cerebellitis have greater long-term morbidity, however outcomes can vary drastically, from death to complete neurologic recovery.

TEXAS POSTER FINALIST - CLINICAL VIGNETTE Brenda S Castillo

A Decitabine-induced and Delayed Presentation of Sweet Syndrome in the Setting of Chronic Myelomonocytic Leukemia.

Title

A Decitabine-induced and Delayed Presentation of Sweet Syndrome in the Setting of Chronic Myelomonocytic Leukemia.

Authors

Brenda S. Castillo B.S., Jesus Guzman, M.D., Jesus Gutierrez, M.D., Sundar Cherukuri, D.O., Abhizith Deoker, M.D., FACP

Introduction

Sweet syndrome (SS), also known as acute febrile neutrophilic dermatosis, presents with an acute onset of pyrexia, neutrophilia, and tender erythematous skin lesions. SS is a diagnosis of exclusion, differential diagnoses include bacterial and viral infections, inflammatory disorders, and malignancies. Clinical features and skin biopsy findings consistent with diffuse neutrophilic infiltrates, aid in diagnosis. SS can be idiopathic; drug-induced or secondary to malignancies. Acute myelogenous leukemia and chronic myelogenous leukemia are associated with SS. Culprits of drug-induced SS include antineoplastic agents, such as azacitidine. SS commonly presents with cutaneous manifestations, but ocular, cardiac, pulmonary, renal, liver, and neurologic involvement can occur. SS is treated with glucocorticoids. Resolution of skin lesions is achieved after the underlying malignancy is treated, or the offending drug is removed. Chronic myelomonocytic leukemia (CMML) is a rare myeloid neoplasm, with an annual incidence of about 4 in 1 million cases. It affects elderly males more commonly, with a median age of 71-73 years. CMML is treated with azacitidine and decitabine, and a stem cell transplant can be curative.

Case Presentation

A 61-year-old Caucasian male, with a past medical history remarkable for newly diagnosed chronic myelomonocytic leukemia (CMML), previously treated with decitabine, presented after a 2-week history of a worsening necrotizing soft tissue infection of his left hand. Prior to presentation, he was treated with antibiotics, without improvement. On presentation, vital signs, and laboratory studies, were not indicative of an infection. The patient was admitted with a working diagnosis of necrotizing soft tissue infection of the left hand, secondary to chemotherapy or malignancy induced necrosis. An infectious workup was started, and broad-

spectrum antibiotics were given. Existing lesions grew and ulcerated further. New lesions appeared on his upper and lower extremities, chest, and back. He underwent multiple debridement procedures of left and right hands. He remained afebrile, and antibiotics were discontinued. After antibiotic discontinuation, he became febrile, and antibiotics were restarted. Throughout hospitalization white blood cell (WBC) count was increasing, and on day 7, complete blood count (CBC) was remarkable for leukocytosis with a WBC count of 16.17 and neutrophilic count of 6.97 with no infectious etiologies identified. On day 10, skin lesion biopsy results from the left hand showed diffuse neutrophilic infiltrates and neutrophilic and neutrophilic vasculitis. A diagnosis of sweet syndrome was made.

Discussion

SS is diagnosed through clinical features, histological and laboratory studies. Cutaneous and extracutaneous manifestations of SS, can often be confused with other entities. Prompt identification and treatment are integral to avoid complications. Malignancy associated SS is most often observed in patients with AML. Existing literature includes a case of azacitidine induced SS in a patient with CMML. Cases of decitabine induced SS have not been described. Our patient underwent treatment with decitabine without the development of SS for two months, while drug induced SS is reported to have a prompt onset after exposure. We describe an unreported case of decitabine induced SS in the setting of a rare myeloid neoplasm, CMML, with a temporal presentation that differs from reports of drug induced SS.

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TEXAS POSTER FINALIST - CLINICAL VIGNETTE Fariha Hameed

Role of Extracorporeal Membrane Oxygenation and Extracorporeal Carbon Dioxide Removal in COVID-19 Management

Title

Role of Extracorporeal Membrane Oxygenation and Extracorporeal Carbon Dioxide Removal in COVID-19 Management

Authors

Fariha Hameed MS2, Kha Dinh, MD, Rahat Hussain, MD, Bindu Akkanti, MD, Biswajit Kar, MD

Introduction

The pneumonia associated with COVID-19 infection can lead to extreme hypoxia and acute respiratory distress syndrome (ARDS) requiring the use of intubation. For severe cases, veno-venous extracorporeal membrane oxygenation (V-V ECMO), a cardiopulmonary bypass system in which venous blood is removed from the body, oxygenated, and then returned, may be a therapeutic tool. ECMO is a well-established therapy for refractory ARDS; however, there is limited literature on its efficacy in managing COVID-19-associated ARDS. Moreover, very few cases have reported utilizing extracorporeal carbon dioxide removal (ECCO2R), a circuit that directly removes carbon dioxide from the bloodstream and facilitates “ultra-low” volume mechanical ventilation in treating refractory respiratory acidosis, in COVID-19 management.

Case Presentation

A 59-year-old Caucasian male pilot for commercial airlines with no past medical history flew to Hong Kong and various US cities, and 6 weeks later noted an abrupt onset of diffuse arthralgias, dry cough, fevers, chills, and rigors. He presented to the ER with a fever with a maximum temperature of nearly 105°F, shortness of breath, dry cough, and oxygen saturation of 93% on room air. Labs indicated lymphopenia, elevated ferritin, and elevated IL-6. His initial CT imaging showed clear lungs with slight ground glass opacifications. Following 10 days of fever, dyspnea, and myalgia, the patient developed ARDS, was intubated for hypoxic respiratory failure, and was diagnosed with COVID-19 pneumonia. After two days, he was cannulated for V-V ECMO respiratory support. Three days later while on V-V ECMO, he received hydroxychloroquine and tocilizumab, and after two weeks, he received COVID-19 convalescent plasma. At that time, he had secondary complications of multi-drug resistant Pseudomonas right empyema, bronchopleural fistula, and associated bacteremia. He had a tension pneumothorax and a drain was placed for resolution of the infection and pneumothorax. He was treated with ceftolozane-

tazobactam and ciprofloxacin for an 8-week course. He also required CRRT for his progressing acute renal failure, but he did not develop ESRD. After a total of 42 days, the patient showed improvement from hypoxia and was taken off V-V ECMO. However, he developed persistent hypercarbic respiratory failure with a pH of 7.10 and PCO2 of 97. Two days later, he was placed on Hemolung, an ECCO2R lung dialysis device to remove carbon dioxide. After one week, the patient underwent a CT scan that indicated significant septal thickening and ground-glass opacities, and a suction catheter revealed large blood clots. A therapeutic bronchoscopy was performed and blood clots were removed bilaterally. The following week, the patient stabilized, and the ECCO2R was removed.

Discussion

This was one of the earliest COVID-19 cases in Houston before better-known therapeutics were being administered. This patient had no predisposing medical conditions to make him more susceptible to contracting the virus, but his travel history and older age did put him at a higher risk. Despite the prolonged runtime of V-V ECMO, secondary pneumonia, and complications, the patient ultimately gained clinical benefit from the use of V-V ECMO and ECCO2R in severe ARDS and refractory hypercapnia related to COVID-19.

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TEXAS POSTER FINALIST - CLINICAL VIGNETTE Matthew Makansi

Raltegravir-Associated DRESS Syndrome in a Pregnant, HIV-Positive Woman

Title

Raltegravir-Associated DRESS Syndrome in a Pregnant, HIV-Positive Woman

Authors

Matthew Makansi; Eugene Stolow, MD, MPH; Danielle Dixon, DO; Diane-Ngan Huynh Trang, MD; Ruth Berggren, MD, MACP

Introduction

Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) syndrome is a rare, yet severe adverse drug reaction characterized by skin eruption, fever, eosinophilia, atypical lymphocytes, lymphadenopathy, and internal organ involvement. We present a case of DRESS in an HIV-positive, pregnant woman to demonstrate confounding variables that can cloud its diagnosis.

Case Presentation

A 31-year-old, 17-week gravid African American female with HIV was initiated on antiretroviral therapy (ART) with emtricitabine/tenofovir (alafenamide) and raltegravir at a CD4+ T-cell count of 37 (4%) and HIV load of 118,000 c/ml. Five weeks later she had a diffuse, pruritic, papular rash on her chest that spread to her face and abdomen. Her CD4 count and viral load had improved to 303 (15%) and 519 c/ml, respectively. She received 6 days of steroids without improvement and presented for further care. On admission, 4-6 mm monomorphic skin-colored papules were densely scattered over her face, neck, axillae, chest, and abdomen (figure 1). She was ill appearing with intermittent fevers, sinus tachycardia, and subjective dyspnea. Leukocytosis, thrombocytosis and mild liver enzyme elevations were noted. CT chest revealed bilateral axillary lymphadenopathy. An infectious workup, antibiotics and antifungals were initiated. On hospital day (HD) 2, ART was discontinued, and WBCs plateaued at 33x103/µL (15% eosinophils). On HD 4, ART was re-initiated, and WBCs increased to 44x103/µL (25-32% eosinophils). On HD 6, skin punch biopsy revealed perivascular dermatitis with eosinophils and a mixed pattern suggesting drug eruption (figure 2); no fungi or mycobacteriae were seen. Fungal, parasitic, viral, and bacterial tests were negative. Blood smear showed atypical lymphocytes and eosinophilia, leading to a presumptive diagnosis of DRESS. Raltegravir was replaced with atazanavir/ritonavir; the patient improved clinically with resolution of the rash

and leukocytosis. One week later, axillary lymph node biopsy revealed a prominent eosinophilic infiltrate representing drug-induced lymphadenitis, further confirming the diagnosis.

Discussion

For the differential diagnosis of disseminated rash, lymphadenopathy, and leukocytosis in the setting of HIV and pregnancy, we considered opportunistic infection with immune reconstitution syndrome, syphilis, or allergic medication reaction including DRESS syndrome. After a negative broad infectious workup, the diagnosis of DRESS was confirmed by skin and lymph node biopsies, monitoring for eosinophilia, peripheral smear, and clinical improvement upon raltegravir discontinuation. Although existing literature is predominately limited to case reports, one retrospective study found an association between raltegravir-associated DRESS and the HLA-B*53:01 allele and African ancestry. Our patient had African ancestry and positive HLA-B*53:01 allele testing. Images of dermatologic findings on dark skin are lacking, especially within texts aimed at generalists. This case provides unique educational images to better understand DRESS presentation on dark skin. Given the variable presentation and time course of DRESS, its potentially life-threatening complications, and the dearth of literature on its relationship to raltegravir, strong clinical suspicion is crucial for diagnosis.

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TEXAS POSTER FINALIST - CLINICAL VIGNETTE Alexandra L Maningat

Herpes Zoster Without the Herpete? Ramsay Hunt Syndrome Zoster Sine Herpete, a Case Report

Title

Herpes Zoster Without the Herpete? Ramsay Hunt Syndrome Zoster Sine Herpete, a Case Report

Authors

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Introduction

Ramsay Hunt Syndrome (RHS) is a rare form of herpes zoster affecting the geniculate ganglion with clinical presentation typically consisting of otalgia, ipsilateral facial paralysis, and vesicular rash affecting the ear, hard palate, and/or the anterior two-thirds of the tongue. Ramsay Hunt Syndrome zoster sine herpete (ZSH) is an atypical presentation of RHS with absence of vesicular rash.1,2

Case Presentation

A 79-year-old female presented to the outpatient internal medicine clinic with complaints of 10/10 right ear pain and unilateral numbness/tingling/neuralgia in a facial nerve distribution. The patient had VZV as a child and had not received a shingles vaccination. Her vital signs were within normal limits. Upon physical exam, tympanic membranes were clear, and no vesicular eruptions noted.

Differential diagnosis in addition to RHS, included Bell's Palsy, Lyme's disease, acoustic neuroma, trigeminal neuralgia, and otitis media.

There was high clinical suspicion for RHS, despite the lack of vesicular rash, due to the patient's severe otalgia and facial pain/numbness in the distribution of nerve fibers arising from the geniculate ganglion.

Treatment included acyclovir for the VZV reactivation oral prednisone for the inflammation of the affected nerves and amitriptyline PRN for neuralgia.

Upon two-week follow-up, the patient reported that her otalgia and facial neuralgia improved to 2/10. An additional course of acyclovir was initiated to ensure the resolution of RHS ZSH, and amitriptyline continued PRN for neuralgia.

Discussion

Herpes zoster has many clinical manifestations, depending on the sensory ganglia affected by latent VZV. In RHS, VZV is reactivated in the geniculate ganglion causing the facial and vestibulocochlear nerve to be affected, leading to the typical presentation of otalgia, ipsilateral facial paralysis, and vesicles along the ear, hard palate, and/or anterior two-thirds of the tongue.1,3,4

RHS ZSH is an atypical presentation of herpes zoster without vesicular eruption. RHS ZSH can be mistaken for Bell's Palsy but has more severe facial paralysis and complications including permanent hearing loss and facial paralysis, this makes early detection and treatment imperative to preventing devastating sequelae. RHS ZSH is typically diagnosed by clinical evaluation, however, if the clinical diagnosis is uncertain, confirmation may be completed utilizing laboratory examinations such as polymerase chain testing (PCR), direct fluorescent antibody (DFA), or viral culture.1,2,3,4

Including RHS ZSH on the differential list for a presentation of facial paralysis and otalgia can prevent permanent damage associated with delayed or incorrect treatment of herpes zoster.1,2,3,4,5,6

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TEXAS POSTER FINALIST - CLINICAL VIGNETTE Jared A Sperling

A Case of Encephalitis Associated With COVID-19

Title

A Case of Encephalitis Associated With COVID-19

Authors

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Introduction

In 2019, there was a widespread outbreak of a novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV2). Initially thought to be isolated to the respiratory system, several studies have shown extrapulmonary manifestations to the heart, kidney, blood, and skin. Neurological and cerebrovascular sequelae have emerged as a rare extrapulmonary manifestation, though the mechanism is currently unknown. Here we present a neurological manifestation in which SARS-CoV2 was associated with the development of acute encephalitis in an otherwise healthy patient without pulmonary symptoms. These rare neurological complications are a unique presentation and diagnostic challenge in patients infected with SARS-CoV2.

Case Presentation

The patient is an 18 year-old male with no past medical history who was brought to the ER by his father due to altered mental status. The patient slept the entire day prior to admission. Family attempted to wake the patient around 4:30PM when his eyes rolled backwards. He started trembling, vomited, and required assistance with walking. His speech “did not make sense.” Two of his co-workers tested positive for COVID-19 in the past week. No history of drug use, cough or shortness of breath was reported. On admission, the patient’s temperature was 101.6˚F. Patient was AOx1, followed simple commands, made eye contact and was cooperative. No photophobia, phonophobia or headache were noted. UDS was negative; synthetic marijuana could not be tested. Our differential diagnoses included bacterial or viral meningitis, encephalitis, recreational drug-related changes and stroke. Neurology was consulted. The patient started empiric treatment for meningitis with ceftriaxone, vancomycin, dexamethasone and acyclovir. CSF analysis revealed RBC 2,230 (spun: clear, colorless), WBC 84 (segs 2%,

lymphocytes 96%, monocytes 2%), protein 112 mg/dL, glucose 69 mmol/L, and gram stain with no polyps or organisms seen. Meningoencephalitis panel was negative. CBC with differential revealed WBC 13.0, MPV 10.0, neutrophils 84.9%, and lymphocytes 8.2%; all others within normal limits. CMP revealed potassium 3.1 mEq/L, chloride 108 mEq/L, glucose 123 mg/dL, and alkaline phosphatase 126 IU/L. Head CT and MRI were within normal limits. EEG revealed mild generalized slowing, suggesting impaired cerebral function. The patient was diagnosed with Acute Aseptic Meningoencephalitis due to COVID-19. Vancomycin, ceftriaxone and acyclovir were discontinued. The patient's encephalopathy improved and he remained afebrile, and was discharged home on steroids.

Discussion

Our patient presented with encephalopathy, aseptic meningitis and positive SARS-CoV2 PCR in the absence of respiratory symptoms. He was discharged home the following day on steroids, noting improvement of symptoms and clinical stability. Several cases have described acute and post-infectious encephalopathy, headache, stroke, seizure, and peripheral neuropathy secondary to COVID. Clinicians are advised to complete full meningoencephalitis work-up and COVID testing in patients presenting with similar symptoms. Various mechanisms for neurological symptoms have been proposed, including neuroinflammatory processes and direct tropism for the CNS. Further study is needed to characterize the mechanisms and acute effects of SARS-CoV2 infection on the nervous system and any residual neurological deficits.

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TEXAS POSTER FINALIST - CLINICAL VIGNETTE Priscilla Tanamal

Treating Vancomycin-Induced DRESS in a Patient with an Implanted Vancomycin-Impregnated Joint Spacer

Title

Treating Vancomycin-Induced DRESS in a Patient with an Implanted Vancomycin-Impregnated Joint Spacer

Authors

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Introduction

Drug reaction with eosinophilia and systemic symptoms (DRESS) is a potentially life-threatening hypersensitivity reaction that can occur with prolonged courses of antibiotics and is most typically associated with fever, skin manifestations, and hypereosinophilia. This adverse drug reaction is of particular concern in prosthetic knee and hip joints, which are managed with intravenous antibiotics, placement of antibiotic-impregnated cement spacers, and delayed second-stage revision arthroplasty. The treatment of DRESS is drug removal and systemic corticosteroids, which is complicated in patients with antibiotic-impregnated spacers. This case demonstrates effective treatment of DRESS without removing the spacer containing the inciting antibiotic.

Case Presentation

Ms. MT is a 72-year old female with past medical history of osteoarthritis who was admitted with a chief complaint of a rash. Two years prior, she underwent a left total knee arthroplasty complicated by multiple prosthetic joint infections. This resulted in eventual hardware removal and vancomycin-meropenem-gentamicin spacer implantation one month prior to presentation. She simultaneously received intravenous vancomycin and meropenem. After approximately four weeks of antibiotics, she acutely developed a diffuse rash characterized by confluent erythematous papules and plaques scattered on her trunk, bilateral upper and lower extremities, and face, and numerous scattered non-follicular pustules on her right flank, upper back, and left thigh. She also had nondesquamating oral lesions on the roof of her mouth. She became febrile to 102F and developed audiovisual hallucinations, confusion, and wheezing. Her left leg was erythematous and edematous with a surgical scar without drainage or induration. A skin biopsy was obtained, and she received intravenous methylprednisolone. She became

increasingly hypotensive with worsening leukocytosis and lactic acidosis, concerning for severe sepsis, and she was subsequently transferred to the MICU for stabilization. She continued to receive methylprednisolone, but her intravenous antibiotic regimen was replaced with daptomycin and metronidazole, covering cultures from her prosthetic joint; her antibiotic spacer was left in place. The pathology of her skin biopsy and complete blood count showing eosinophilia was consistent with DRESS, likely due to vancomycin. Despite her antibiotic spacer remaining in place, her vital signs stabilized, her rash and pruritus began to subside, and she was transitioned to oral prednisone after six days. The patient was discharged on an oral prednisone taper with follow up with the dermatology clinic and orthopedic clinic.

Discussion

While vancomycin-induced DRESS is rare, a sharp increase in reported cases has been reported in the past few years, perhaps due to the emergence of methicillin-resistant staphylococcus aureus. Specifically, there are reported cases in the orthopedic patient population of patients developing DRESS after a prolonged course of vancomycin. In a small number of case reports concerning patients treated for prosthetic joint infections with both intravenous and cement-impregnated vancomycin, resolution of DRESS occurs with systemic corticosteroids and removal of only the intravenously administered vancomycin. Mrs. MT's case supports the scant literature documenting resolution of vancomycin-associated DRESS in patients with a retained vancomycin-laden spacer. These observations can guide management of similar cases and may suggest no need to remove an antibiotic spacer, reducing the need for additional operations.

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TEXAS POSTER FINALIST - CLINICAL VIGNETTE Frank L Ventura

A Curious Case of Spermatochezia

Title

A Curious Case of Spermatochezia

Authors

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Introduction

Rectal-prostate fistulas are uncommon anatomical connections between the prostatic urethra and rectum that are typically iatrogenic but can also result from other underlying pathology. Here, we present a unique case of a rectal-prostate fistula causing rectal passage of sperm.

Case Presentation

A 33-year-old male with a history of illicit drug use presented with five days of testicular pain. He also reported a substantial amount of sperm passage from his rectum with ejaculation for the past two years. Vital signs were within normal limits. Physical examination was notable for left testicular swelling with a positive Prehn's sign and a defect in the anterior rectal wall on digital rectal exam. Labs showed a neutrophilic leukocytosis and urinalysis was suggestive of a urinary tract infection. Computed tomography of the pelvis revealed evidence of left epididymo-orchitis and a gas-filled structure within the posterior aspect of the prostate consistent with a rectal-prostate fistula, confirmed with a voiding cystourethrogram (VCUG). He was treated with piperacillin-tazobactam, and a joint colorectal and urologic surgical fistula repair was performed. Extensive work-up to rule out infectious causes, inflammatory bowel disease, and malignancy was unremarkable. Further investigation divulged a three-week comatose-state due to cocaine and phencyclidine intoxication two years prior with documentation suggesting a traumatic Foley catheter placement and strong suspicion for premature balloon dilation in the prostatic urethra. The patient denied rectal manipulation, anal penetration, or history of trauma. Repeat VCUG revealed resolution of the fistula, and the patient recovered with only mildly reduced antegrade ejaculatory volume.

Discussion

Several etiologies of rectal-prostate fistulas are well-established including fistulizing Crohn's disease, regional radiation, cryotherapy, and severe trauma (2). Cases secondary to foley catheter placement have not been previously reported in the literature. Urethral catheters, though often misused, are effective tools in both the inpatient and outpatient settings, particularly for the temporary relief of urinary retention. However, it is crucial for clinicians to recognize the numerous potential complications that oftentimes becomes an afterthought to many providers. Recurrent urinary tract infections, contributions to antimicrobial resistance, potential for kidney and bladder damage, and localized trauma to the urethra are only a few potential complications that can be burdensome both to the patient and healthcare system (1,2). This case not only highlights a rare complication of catheter use, but also emphasizes the importance of provider mindfulness when utilizing seemingly benign therapies such as foley catheters.

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UTAH POSTER FINALIST - CLINICAL VIGNETTE Federica Brecha

When Elevated Lactate Is Not Due to Shock: Consider Thiamine Deficiency

Title

When Elevated Lactate Is Not Due to Shock: Consider Thiamine Deficiency

Authors

Federica Sternini Brecha, BS (University of Utah School of Medicine) Shannon Jones, PharmD (University of Utah, Department of Internal Medicine) Natalie M. Como, MD (University of Utah, Department of Internal Medicine, Division of General Internal Medicine)

Introduction

Thiamine deficiency causing beriberi and Wernicke's encephalopathy is classically associated with alcohol abuse but can occur in many scenarios.[1] This underrecognized condition is easily treated and reversed with thiamine supplementation.[2] Here we present a patient with malabsorption and subsequent thiamine deficiency leading to multisystem disease.

Case Presentation

The patient is a 57-year-old male with a small bowel and liver transplant due to a motor vehicle accident 20 years prior and end ileostomy due to carcinoma. His chief complaint was "dizziness," consisting of lightheadedness and diplopia. His wife described three months of progressive forgetfulness and fabricating stories. Additionally, he had parasthesias in his thighs, high ostomy output and progressive exertional dyspnea. On admission, he was well appearing but in mild respiratory distress. VS: BP 106/76, HR 106, RR 24, T 37.0, SpO2 98% on room air. Labs included sodium 130, troponin 14, lactate 6.3, CRP 7.4, and ESR 30. EKG showed sinus tachycardia and non-specific ST changes. CT chest showed small bilateral pleural effusions. The patient was admitted and treated with IV fluids due to suspicion of dehydration from his ostomy output (~6L/day). After a few days he became hypotensive and infectious workup returned negative. Echocardiogram showed ejection fraction of 30-40% with wall motion abnormalities and a moderate sized pericardial effusion. Three months prior, he was admitted with a similar presentation and lab values (troponin 13, lactate 9). Left heart catherization was normal and he was treated for presumed pneumonia and NSTEMI. In the ICU he received high dose thiamine, which is our institution's standard of care for critically ill patients with altered mental status. He improved and discharged home. With no improvement and chart review, thiamine deficiency was considered. Thiamine level was drawn and empiric treatment was started. MRI brain showed contrast enhancement involving mammillary bodies and medial

anterior thalami with focal hemorrhage involving the left mammillary body consistent with Wernicke's encephalopathy.[3] Thiamine level eventually returned low (62nmol/L; normal range 70-180nmol/L). After five days of high dose IV thiamine, the patient experienced complete resolution of exertional dyspnea, memory issues, diplopia, and parasthesias. Echocardiogram was repeated and showed normalized EF to 55%. He was discharged with oral and IM thiamine to ensure good effect in case of unreliable gastrointestinal absorption. Eighteen days after discharge he was transitioned to oral thiamine as his labs were within normal range.

Discussion

Thiamine deficiency occurs in many clinical situations, including alcohol use, malnutrition, malabsorption, loop diuretic use, and HIV/AIDS.[4-7] Here, lactic acid and troponin levels were diagnostic clues. Thiamine pyrophosphate is a crucial co-factor in the citric acid cycle and prevents lactate buildup.[10] A slowed or stopped citric acid cycle damages high energy cells, including myocardial cells, leading to elevated troponin. Thiamine repletion is considered safe, and thus should be initiated empirically when deficiency is suspected since whole blood testing can take several days.[8] Thiamine administration is therapeutic and diagnostic as ventricular function and lactic acid levels typically normalize quickly with repletion. Providers should consider thiamine deficiency in patients with risk factors as it mimics other disease states.

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UTAH POSTER FINALIST - CLINICAL VIGNETTE Federica Brecha

Acute Kidney Injury Requiring Dialysis in a Patient with Tobramycin Containing Bone Cement

Title

Acute Kidney Injury Requiring Dialysis in a Patient with Tobramycin Containing Bone Cement

Authors

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Introduction

Bone cements, loaded with multiple antibiotic types, are frequently used during two-stage revisions of prosthetic joint infections.[1,2] Antibiotic combinations, such as tobramycin and vancomycin, are used for synergistic effects. Systemic absorption of tobramycin is thought to be low, however little is known about the effect of bone cement antibiotic dosages on the kidneys. One study of 50 patients found a 20% incidence of acute kidney injury (AKI) with median onset at post-op day (POD) 2, in patients receiving bone cement spacers with tobramycin plus or minus vancomycin.[3] Here we present a case of a woman with post-operative non-oliguric AKI after the implantation of a bone cement for a prosthetic joint infection.

Case Presentation

The patient is a 66-year-old woman with a complicated history of recurrent left knee prosthetic joint infections. During this hospitalization, she underwent the first of a planned two-stage revision of the left total femur replacement. Her pre-operative baseline creatinine was 0.6 mg/dl. A bone cement was placed containing 26.5 g of tobramycin and 13 g of vancomycin. Notably, she also had acute blood loss operatively and received six units of blood. The evening of surgery, the patient's tobramycin level peaked at 17ug/ml. On POD2, her labs showed creatinine of 1.67 mg/dl, FeNa of 1.3%, urinalysis notable for 1.005 specific gravity, 18 WBC and 4RBC; urine microscopy was negative for RBCs, WBCs and had a rare granular cast. Her creatinine steadily increased to 4.91 mg/dl on POD4 with tobramycin level of 14.8 ug/ml. She continued to make > 2 L of urine per day but hemodialysis was initiated primarily for clearance of tobramycin. Creatinine and tobramycin levels both steadily decreased by day 3/3 of hemodialysis, creatinine was 2.25 mg/dl and tobramycin was 7.7 ug/ml. Although the patient's creatinine increased slightly again post-dialysis before eventually downtrending, her tobramycin level continued to decrease to 6.3 ug/ml on POD 12 as her urine output continued to increase (UOP of 5L) and she was discharged with a creatinine of 2.1 mg/dl.

Discussion

A systematic review from 2013 reported about a 5% incidence of AKI in patients receiving bone cements with antibiotics and there are few case reports describing AKI related to bone cement spacers containing tobramycin.[4] The therapeutic peak range of tobramycin is 3 to 10 ug/mL, while the critical value is > 12 ug/mL. Our patient had a peak tobramycin level of 17 ug/ml. AKI due to antibiotic impregnated bone cement spacers should be considered in the differential diagnosis in patients with increasing creatinine after prosthetic joint revision surgery. This can be a vicious cycle as decreased kidney function leads to less antibiotic clearance and rising antibiotic levels cause ongoing renal damage. There are not guidelines for hemodialysis in this situation in the absence of other indications. Here we present a unique case of tobramycin clearance with hemodialysis followed by renal recovery, sparing the need for antibiotic spacer removal. As the patient's urine output dramatically increased after 3 days of dialysis we believe correction of supratherapeutic tobramycin levels lead directly to improvement in AKI.

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VIRGINIA POSTER FINALIST - CLINICAL VIGNETTE Omar Elghawy

Clinical Presentation of Minimal Change Disease Secondary to Graft Versus Host Disease after Allogeneic Hematopoietic Cell Transplant (HCT)

Title

Clinical Presentation of Minimal Change Disease Secondary to Graft Versus Host Disease after Allogeneic Hematopoietic Cell Transplant (HCT)

Authors

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Introduction

Allogeneic hematopoietic cell transplant (HCT) has revolutionized the treatment of various hematologic neoplasms; however, it is associated with significant morbidity and mortality due to graft versus host disease (GVHD).1 GVHD occurs when either autoreactive or microchimeric T cells attack host tissue including the skin, gastrointestinal tract, lung, liver and rarely kidney.2 In the setting of renal GVHD, several renal pathologies have been described including minimal change disease (MCD).3 While rare, it is important to consider MCD on the differential diagnosis in patients with HCTs presenting with albuminuria, renal insufficiency and peripheral edema.

Case Presentation

A 64-year-old male presented with symptoms of fatigue, chronic leukopenia, and recurrent granuloma annulare. Bone marrow aspirate and biopsy revealed mild erythroid and megakaryocytic dysplasia with increased blasts consistent with myelodysplastic syndrome (MDS). After three cycles of azacitidine without improvement in his MDS, the patient received a

reduced intensity conditioning (Fludarabine/Busulfan) allogeneic peripheral blood HCT from a matched unrelated female donor with minor ABO incompatibility (O+ donor to A+ recipient).

The patient's post-HCT course was complicated by idiopathic pneumonia syndrome and an autoimmune hemolytic anemia 2 months and 8 months after HCT, respectively. On presentation for the autoimmune hemolytic anemia, routine lab work revealed an elevated creatinine (1.8 mg/dL) and drastically reduced hemoglobin (4.9 g/dL). Shortly after the diagnosis of the hemolytic anemia, the patient presented with lower extremity edema, fatigue, and hypertension which was initially attributed to glucocorticoid therapy. His symptoms worsened with dyspnea on exertion, extreme hypertension, and severe lower extremity edema that progressed to his upper extremities, abdomen, and scrotum. He experienced numbness in his legs, pain with skin stretching, frothy urine and a 50 lb weight gain. Chemistries 5 weeks after presentation for hemolytic anemia showed an elevated BUN (87 mg/dL), rising creatinine (3.1 g/dL) and low serum albumin (2.3 g/dL). Urinalysis revealed an elevated protein and hyaline casts. Renal biopsy with an ultrastructural evaluation via electron microscopy demonstrated severe effacement of the visceral podocyte foot processes with no glomerular abnormalities. Immunofluorescence microscopy for albumin revealed tubular protein droplet staining, casts staining, and normal linear staining of basement membranes.

A diagnosis of MCD was made secondary to GVHD. The patient was started on an immunosuppressive combination of tacrolimus adjusted for a trough level 4-8 ng/mL, prednisone taper over 4 months and later mycophenolate (500 mg BID) was added for simultaneous GVHD of the lungs. Due to subsequent paresthesia's, the tacrolimus was withdrawn, and mycophenolate was increased to 1000 mg BID. With treatment, the patient's edema significantly improved, serum creatinine stabilized at 2.0 mg/dl and albumin recovered to 3.9 g/dL. MCD resolved completely with no further complications on his last office visit 804 days post-HCT.

Discussion

This case highlights the importance of considering MCD in patients with renal insufficiency, albuminuria, and anasarca after HCT. Renal biopsy is necessary to diagnose MCD. Early combination therapy using tacrolimus and prednisone may improve patient outcomes, although further work is required to determine how GVHD impacts the kidneys to cause MCD.

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VIRGINIA POSTER FINALIST - CLINICAL VIGNETTE Varun Jain

A lifting agent granuloma identified in woman twenty-five weeks following sessile serrated adenoma polypectomy

Title

A lifting agent granuloma identified in woman twenty-five weeks following sessile serrated adenoma polypectomy

Authors

Varun Jain, BS; Eric Sellers, MD

Introduction

Premalignant lesions and early cancers of the gastrointestinal tract are removed primarily through endoscopic mucosal resection (EMR) or endoscopic submucosal dissection (ESD).1 To optimize technical success and avoid deeper tissue injury, endoscopists lift the mucosa by expanding the submucosal space with saline or a commercial lifting agent. The use of commercial lifting agents containing a contrasting dye and viscous solution has been thought to provide a longer-lasting cushion for these procedures when compared to normal saline, potentially allowing for improved ease and quality of resection.2,3 They are all composed of a proprietary mixture of compounds in order to achieve these results. Reports of local inflammatory reactions associated with the use of these compounds have previously been described.4–8

Case Presentation

A 46-year-old female with a family history of CRC and colon polyps was seen for initial screening colonoscopy. The patient's maternal grandmother and paternal grandfather were diagnosed with CRC, and her mother had tubular adenomas diagnosed at age 45. The initial colonoscopy was notable for a 15 mm sessile serrated adenoma in the cecum. After an injection lift with ORISE Gel™, the polyp was resected utilizing hot snare polypectomy. Three hemostatic clips were placed to prevent future bleeding. The patient was advised to follow up in 6 months for repeat colonoscopy.

At follow-up colonoscopy, a well-healed polypectomy scar was appreciated in the cecum. Lateral to this site was an 8 mm area of tan, abnormally raised colonic tissue. Given the concern for residual polyp, this area was completely resected utilizing hot snare polypectomy. Histologic examination of the resected tissue was consistent with a foreign-body reaction and amorphous

eosinophilic material consistent with lifting agent was noted. She was advised for 3-year surveillance interval for her next colonoscopy.

Discussion

The use of a submucosal lift may improve the safety of EMR by providing a submucosal cushion that limits risk of perforation and deep thermal injury to the underlying tissue. Newer agents such as ORISE Gel™ show greater efficacy compared to saline injection in achieving adequate longer-lasting submucosal cushions.2

As we utilize new compounds, we must be vigilant of potential downstream effects. This case demonstrates one such effect as a likely result of the proprietary blend of compounds used to increase the viscosity of the submucosal lifting solutions. Although rare, prior reports have indicated localized inflammatory reactions at lift-polypectomy sites as well as lack of gel resorption after weeks.4–8 Westbrook et. al. have proposed the named "lifting agent granuloma" to describe this phenomenon.6 These reports align with our case. Moreover, to our knowledge, at 25 weeks from initial submucosal injection, our case represents the longest recorded interval of ORISE Gel™ remaining in a patient's tissue.

Endoscopists should be aware of this "lifting agent granuloma" as a consequence of ORISE Gel™. While "lifting agent granulomas" have not shown negative clinical consequences, its presence may complicate the surveillance of EMR and ESD sites. This report highlights the possibility of ORISE Gel™ creating a suspicious artifact upon colonoscopy and the importance of endoscopist-pathologist collaboration.

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VIRGINIA POSTER FINALIST - CLINICAL VIGNETTE Prajeeth Kumar Koyada

Partners in Crime: Meropenem-Associated Exacerbation of Ertapenem-Induced Encephalopathy

Title

Partners in Crime: Meropenem-Associated Exacerbation of Ertapenem-Induced Encephalopathy

Authors

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Introduction

Carbapenems are a class of ß-lactam antibiotics that have grown in use as the incidence of multi-drug resistant organisms has increased. This class shares the same side effect profile as other ß-lactam antibiotics and cephalosporins, but there is an increasing recognition that this same class may rarely lead to reversible encephalopathy. This report is one of the first descriptions of acute encephalopathy brought upon by administration of ertapenem and exacerbated after subsequent substitution with meropenem.

Case Presentation

A 60-year-old male with a past medical history of lumbar osteomyelitis presented with a three-day history of altered mental status. This patient had recently been admitted for his lumbar osteomyelitis at an outside hospital, administered a course of meropenem and vancomycin there without complication, and had completed nine of 32 scheduled outpatient doses of daily ertapenem and daptomycin. Three days prior to presentation, the patient had a fall with loss of consciousness and seizure-like activity. Subsequently, the patient experienced a significant decline in his mental status. He became unusually lethargic and ataxic, his speech became unintelligible, and he had a visual hallucination where he saw his late mother lying in his bed. On presentation, physical exam was notable for impaired attention with orientation to self only, dysarthria, and diffuse hyperreflexia with bilateral myoclonus. Ertapenem and daptomycin were substituted with meropenem and vancomycin and an extensive workup – CBC, CMP, LFTs, eGFR (73 mL/min/1.73 m2), serum albumin (3.3 g/dL), urine drug screen, urinalysis, head CT, cEEG, blood cultures grown throughout admission, and various infectious panels including

Cryptococcus, Lyme, syphilis, and HSV/VZV – was unrevealing. That evening, the patient became markedly agitated and started assaulting staff. The following afternoon, his continued agitation necessitated sedation and intubation for his MRI and lumbar puncture; both studies were found to be unremarkable. On hospital day three, the patient was extubated and meropenem was substituted with ceftriaxone out of concern for carbapenem-induced encephalopathy. On hospital day four, the patient was calm and alert, oriented to self and place, and spontaneously conversing with his sons and staff; by the next day, he was back to his baseline neurologic status and was discharged soon after with close follow-up.

Discussion

This case illustrates the potential for severe encephalopathy secondary to carbapenem therapy even in patients with normal renal function and serum albumin levels. The Naranjo Adverse Drug Reaction Probability score for this patient is 7, indicating a probable causal relationship between drug exposure and his clinical presentation. This case also highlights the hitherto undescribed risk for exacerbation of encephalopathy after carbapenem substitution, as shown by this patient's transition from marked somnolence to severe agitation following ertapenem substitution with meropenem. Overall, recognition of the carbapenems' ability to cause a rapidly reversible encephalopathy is essential to the evaluation and management of the undifferentiated patient presenting with a non-specific change in mental status; this will be especially critical in the years to come as these antibiotics garner greater popularity and increased use against multi-drug resistant organisms.

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WASHINGTON POSTER FINALIST - CLINICAL VIGNETTE Nobel Nguyen

Fahr's Syndrome Pathophysiology in an Adolescent with Congenital Albright Osteodystrophy

Title

Fahr's Syndrome Pathophysiology in an Adolescent with Congenital Albright Osteodystrophy

Authors

Nobel Nguyen, MSIII, Shae Patel, MSIII, Victoria Bryant, PhD, Tala Dajani, MD

Introduction

Basal ganglia calcifications are synonymous with Fahr's syndrome (FS). FS can be caused by a primarily genetic disorder or secondary to endocrine pathology. A diagnosis of exclusion, FS clinical diagnosis includes bilateral basal ganglia calcifications, positive family history, and neurological symptoms. Secondary FS is most commonly associated with calcium metabolism disorders and is most often diagnosed in the 4th or 5th decade of life. We describe the first development of presumptive FS in an adolescent patient with an incidental finding of basal ganglia calcifications as a comorbidity to Albright's hereditary osteodystrophy (AHO), characterized by short stature, hypocalcemia, thyroid hormone resistance, parathyroid hormone resistance, polyostotic fibrous dysplasia, and mild intellectual disability.

Case Presentation

QD is an 18-year old male who was diagnosed with AHO at age 4 years and chronic headaches at age 6 years. He presented for emergency evaluation of a debilitating headache associated with emesis and dizziness at age 18 years. Vital signs were: 98.6°F, HR 103 beat per minute, RR 18 breaths per minute, BP 122/77 mmHg, 98% RA, 5'1", 72 kg. A diagnostic CT scan demonstrated "striking" calcifications in the caudate, globus pallidus, throughout the cerebrum, and in the frontoparietal subcortical regions. His medications included levothyroxine 100 mcg daily and calcitriol 0.5 mcg daily. He denied missed doses. Laboratory evaluation revealed normal CBC, CMP, glucose 83 mg/dL, Calcium 8.9 mg/dL, TSH 1.34 uIU/mL, Free T4 1.56 ng/dL, HbA1c 5.4%, 1,25 vitamin D 14.33 ng/mL(19.9-79.3) 25 vitamin D 13.3 ng/mL(30-100). Follow-up MRI showed no additional lesions. Radiological consultation concluded that this was a comorbid diagnosis of FS with AHO phenotype. His biological mother developed subcutaneous nodules when she was a child and was diagnosed with type 2 diabetes mellitus as an adult.

Discussion

AHO, also described by pseudohypoparathyroidism type 1a, is inherited in an autosomal dominant (AD) manner.3 AHO clinical features are parathyroid and thyroid hormone resistance.4 FS is characterized by bilateral basal ganglia calcifications with a possible myriad of neurological and/or psychiatric symptoms described in the 4th or 5th decade. QD was diagnosed with congenital AHO, chronic headaches, global developmental delay, and chronic constipation in childhood, who presented with FS findings in the second decade of life. CT scan met radiological imaging criteria for FS. This presentation of FS in QD is noted much earlier in life than previous reports of FS findings. It is unclear if children with congenital PTH resistance are at risk of developing basal ganglia calcification early in life leading to neurological or psychiatric symptoms. Further studies are needed to elucidate the incidence and prevalence of FS in children and teens with congenital calcium dysmetabolism. Diagnosis of FS could be made earlier and can help determine the natural history, progression, and possible early interventions for this disease. Further investigation is needed to elucidate if routine cranial imaging is indicated in children with congenital calcium disorders to determine natural history into adulthood. In conclusion, early detection of FS in a young patient can be critical in the early identification and management of FS related symptoms.

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WEST VIRGINIA POSTER FINALIST - CLINICAL VIGNETTE Seth Noorbakhsh

Recurrent catheter-associated Tsukamurella bacteremia and suspected endocarditis in a patient with poor nutritional status

Title

Recurrent catheter-associated Tsukamurella bacteremia and suspected endocarditis in a patient with poor nutritional status

Authors

Seth Noorbakhsh, Benita Wu MD, Jacob Fuqua MD, and Laura Davisson MD MPH FACP

*All authors are associated with West Virginia University School of Medicine.

Introduction

Tsukamurella is a Gram-positive aerobic bacillus related to Corynebacterium that rarely causes infection in humans outside of immunocompromised hosts. Case reports of Tsukamurella infection document mainly catheter-associated bacteremia, meningitis, and pneumonia. One case of Tsukamurella endocarditis has been reported in a patient undergoing chemotherapy, successfully treated with TMP-SMX. Here, wpresent a case of recurrent central venous catheter-associated Tsukamurella bacteremia with possible Tsukamurella endocarditis in a 55-year-old female with a complicated gastrointestinal history

Case Presentation

A 55-year-old female with a history of multiple hospitalizations due to complications from GI perforation and recurrent Tsukamurella pulmonis bacteremia was re-admitted for intractable nausea and anemia secondary to acute GI blood loss (Hgb 6.8). On presentation, her vital signs were unremarkable, but she was pale, ill-appearing, and cachectic, with diffuse abdominal tenderness. The patient had PEG- J tube and Hohn catheter in place with no signs of infection on admission. Due to recurrent T. pulmonis bacteremia, she was on long term trimethoprim-sulfamethoxazole (TMP-SMX) for suppression therapy. During her admission, she developed pancytopenia with white blood cell count (WBC) 4,000/uL, platelet count (PLT) 85,000/uL, and absolute neutrophil count (ANC) 1790/uL. Thus, her TMP-SMX was held on recommendation of the Infectious Disease team. Five days later, the patient developed a fever of 100.9 F. Empiric therapy of vancomycin, cefepime, and metronidazole was initiated, and her Hohn catheter was

removed. Blood cultures with speciation confirmed recurrence of Tsukamurella infection, and therapy was switched to a targeted two-week course of levofloxacin and trimethoprim-sulfamethoxazole, with plans for life-long trimethoprim-sulfamethoxazole monotherapy. Due to the chronic, recurrent nature of her Tsukamurella infections, endocarditis was suspected. Cardiac PET/CT was obtained because the patient's esophageal strictures prevented transesophageal echocardiogram (TEE) and was negative. After appropriate antibiotic therapy with TMP-SMX, repeat blood cultures returned negative, and the patient's Hohn catheter was replaced at the time of discharge.

Discussion

This case illustrates the challenges faced in the management of recurrent Tsukamurella infection, particularly in the setting of adverse reaction to the mainstay of suppression therapy, TMP-SMX. Most cases of Tsukamurella infection are associated with underlying immunodeficiency. In this case, our patient's poor nutritional status related to her complicated GI history likely contributed to an immunocompromised state, making her susceptible to colonization with T. pulmonis. In addition, the patient's Hohn catheter access also made her susceptible to Tsukamurella infection. It is important to evaluate for endocarditis in patients with recurrent bacteremia. However, sensitivity of cardiac PET/CT scan to detect endocarditis is low (39%) in native valvular disease, with a negative predictive value of only 82%. In this way, Tsukamurella endocarditis cannot be excluded in this patient. Catheter-associated bacteremia is classified as complicated when associated with other disease processes such as septic thrombosis, osteomyelitis, or endocarditis. Complicated catheter-associated bacteremia requires an extended course of treatment, sometimes lifelong.

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WEST VIRGINIA POSTER FINALIST - CLINICAL VIGNETTE Bradley Owens

Spontaneous Pneumocephalus: a rare complication of CPAP use

Title

Spontaneous Pneumocephalus: a rare complication of CPAP use

Authors

Bradley Owens MSIII; Kylie Parrish, MD; Jennifer Turner, MD

Introduction

Pneumocephalus is presence of air within the cranial cavity that is most often associated with trauma or iatrogenic causes. Cases typically involve prolonged sneezing, coughing, frequent Valsalva, and the sphenoid sinus is usually implicated. Presentations include recurrent or chronic headaches, without history of migraine, that are unrelieved by NSAIDs. There may be concurrent dizziness, syncope, bulbar palsies, meningeal signs, or loss of consciousness. The primary imaging modality used is CT, but flexible endoscopy can also confirm the diagnosis. Management is usually conservative with rest, supplemental oxygen, limiting rise of intracranial pressure, and limited activity. Most cases resolve spontaneously, but some rarely require surgery.

Case Presentation

A 67 year old female with medical history of type two diabetes, obstructive sleep apnea, and carotid arterial disease presents with sudden loss of conscious at primary care clinic following chronic complaints of headache, facial numbness, neck stiffness, and dysarthria. The patient was diagnosed via CT with non-tension pneumocephalus. She was admitted for monitoring and serial imaging. Her treatment was conservative management with CPAP use discontinued until resolution. Flexible endoscopy demonstrated thinning of the sphenoid sinus. The patient had severe carotid stenosis with signs of chronic micro-aneurysms affecting the right thalamus and putamen. Total length of stay was 7 days with spontaneous resolution of the pneumocephalus. On discharge, the patient was discouraged from using CPAP, but one month later she suffered narcosis from hypercarbia necessitating use of CPAP at the lowest tolerable level.

Discussion

Pneumocephalus is a rare often iatrogenic condition that was first described in 1741. Spontaneous cases can be difficult to recognize and diagnose. The condition requires a weakness within the cranial vault, most often at the sphenoid sinus, and a gradient to permit air entry. Cases may associate frequent Valsalva inducing maneuvers or lumbar puncture with excessive drainage. Other causes include infection, trauma, neoplasm, and altitude changes. This case had an associated sphenoid sinus defect and associated use of high pressure CPAP for OSA. Cessation of the CPAP along with conservative management allowed spontaneous resolution. The clinical presentation was initially vague consisting of recurrent headaches and neck pain without obvious origin. The onset was insidious taking place over several months with associated arthralgia, unilateral facial numbness, and dysarthria. Before diagnosis, it was necessary to rule out primary neurological disease, trauma, infection, and other secondary neurological sources. This patient had underlying stenotic disease of the carotid arteries bilaterally which may have made the patient more likely to lose consciousness from pneumocephalus. Management in most cases involves rest, activity limitation, stool softeners, avoidance of Valsalva, cough, or sneeze, and supplemental oxygen. Use of oxygen encourages nitrogen to dissolve within the blood and relieve the collection of air. Rarely, surgical intervention to correct the associated skull deformity is necessary to prevent recurrence or for persistent pneumocephalus. This case was unique because of the associated CPAP use, which required a modification in that therapy. The patient required re-initiation of CPAP due to symptomatic hypercarbia within one month, and this associated condition may indicate a need for future surgical intervention.

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WISCONSIN POSTER FINALIST - CLINICAL VIGNETTE Jason Cummings

A Case of Rhabdomyolysis and Acute Kidney Injury Associated with COVID-19 in a 55 Year Old Man

Title

A Case of Rhabdomyolysis and Acute Kidney Injury Associated with COVID-19 in a 55 Year Old Man

Authors

Jason Cummings, MS3 and Khalid Mohamed, MD

Introduction

COVID-19 has been reported to have effects on many different organ systems including but not limited to the respiratory system, gastrointestinal system, cardiovascular system, and central nervous system. An additional reported symptom of SARS-CoV-2 is rhabdomyolysis, a condition characterized by severe acute muscle injury. However, to date the literature describing an association between SARS-CoV-2 and rhabdomyolysis is relatively sparse.

Case Presentation

A 55 YO male with a past medical history significant for hypertension and diverticulitis presented to the ED with generalized myalgias, SOB and chest pain in the context of testing positive for SARS-CoV-2 three days prior to admission. Initial onset of symptoms associated with SARS-CoV-2 was 10 days prior to admission. Upon admission to the ED, the patient was afebrile with a pulse of 76, RR of 22, BP of 85/52 mm Hg, and his oxygen saturation was 86% on room air. He was quickly placed on 2 L NC oxygen with quick improvement. Initial lab work-up was significant for WBC count of 15,000/microliter, creatinine of 8.66 mg/dL, BUN of 68 mg/dL, sodium of 133 mmol/L, bicarbonate of 16 mmol/L, anion gap of 23 mEq/L, Ferritin of 2,599 micrograms/mL, D-Dimer 2.39 micrograms/mL, LDH 442 U/L, procalcitonin of 3.26 ng/mL and lactic acid of 1.0 mmol/L. Urinalysis was significant for 3+ blood in urine, 2+ protein in urine, 6-10 WBCs/hpf, 6-10 RBCs/hpf and hyaline casts. The patient was given 2 L of Lactated Ringer solution in ED and was then placed on maintenance fluids with normal saline at a rate of 100 ml/hr. Additionally, the patient was started on dexamethasone on day 1 of admission. On day 2 of admission, creatine kinase levels were obtained and measured 2,499 U/L, WBC had improved to 13,400/microliter, creatinine had slightly improved to 7.74 mg/dL, BUN was measured at 70

mg/dL, and CRP was 12.7 mg/dL. On day 2 of admission, normal saline was changed to lactated ringer solution and the rate of fluids was increased from 100 ml/hr to 125 ml/hr. By day 3 of admission, creatine kinase levels had already decreased to 1,596 U/L. Lactated ringer solution continued to be administered at a rate of 125 ml/hr, and the patient reported progressive improvement in symptoms. By day 4 of admission, WBC count had normalized to 9,600/microliter, BUN decreased to 44 mg/DL and creatinine was down to 1.45 mg/dL. IV fluids were discontinued on the fourth day of admission and the patient was observed for an additional 24 hours before discharging after a 5 day hospital course during which he received a net positive 5 liters of fluids. Prior to discharge, a final BMP was obtained which demonstrated a creatinine level of 1.32 mg/dL.

Discussion

This case contributes to the growing body of evidence describing an association between SARS-CoV-2 and rhabdomyolysis. Consequently, it is reasonable to always consider rhabdomyolysis in patients that have recently been diagnosed with SARS-CoV-2 and present with severe myalgias accompanied by an AKI. Early recognition followed by aggressive IV fluid treatment can result in a relatively quick return to baseline kidney function.

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WISCONSIN POSTER FINALIST - CLINICAL VIGNETTE Leilani HERNANDEZ

IDENTIFICATION AND TREATMENT OF BLASTOMYCOSIS IN AN IMMUNOCOMPETENT HMONG PATIENT

Title

IDENTIFICATION AND TREATMENT OF BLASTOMYCOSIS IN AN IMMUNOCOMPETENT HMONG PATIENT

Authors

Leilani Hernandez MPH, Pinky Jha MD

Medical College of Wisconsin, Milwaukee WI

Introduction

People of Hmong ancestry are at increased risk of Blastomycosis which is a rare but life-threatening fungal infection. Large populations of Hmong have settled in Wisconsin which is an area endemic to Blastomycosis 1. In addition, Hmong are more susceptible to this infection due to genetic differences in immune response to Blastomyces dermatitidis 2.

Diagnosis and subsequent treatment are often delayed since it presents with non-specific symptoms and rarely occurs in immunocompetent hosts. Presenting symptoms include cough, fever, sputum production, hemoptysis, shortness of breath, weight loss, night sweats, and chills. Here we report the identification and treatment of blastomycosis in an immunocompetent Hmong patient who presented with non-specific pulmonary symptoms.

Case Presentation

A 44-year-old Hmong female presented to the Emergency Department with cough and shortness of breath. The cough started three weeks prior to presentation and produced yellow-green sputum. She also experienced fevers and chest pain during this time. One week prior, her PCP recommended a cough medicine with no improvement of symptoms. She denied sore throat, congestion, hemoptysis, headaches, rash, sick contacts, and recent travel.

Vitals signs were significant for tachycardia to the 120s and oxygen saturations in the low 90s. Rhonchi were heard throughout all lung fields. Chest X-ray showed bilateral perihilar and basilar

opacities greater on the left side. She was started on ceftriaxone and azithromycin in the ED and vancomycin was added the next day on the hospital floor. Despite antibiotics, she continued to have fevers, cough, and shortness of breath. Per Infectious Disease consult, a CT scan and cultures were obtained. Infectious work up including QuantiFERON-TB and COVID-19 testing were negative.

Itraconazole was started three days after presentation due to a presumed Blastomycosis diagnosis when sputum cultures revealed broad based budding yeast. Chest CT revealed diffuse scattered consolidative and nodular densities with complete consolidation of the left lower lobe and early central cavitary changes. Urine later confirmed Blastomyces antigens. Amphotericin B was added one day after starting Itraconazole for worsening respiratory status and persistent tachycardia. Despite treatment, Pulmonology recommended transfer to the ICU six days after admission due to impending respiratory failure.

Discussion

In Midwestern states with a high Hmong population, it is important to keep Blastomycosis high on the differential. It is frequently misdiagnosed as community acquired pneumonia, viral pneumonia, or Tuberculosis leading to delayed treatment and worse outcomes. If a Hmong patient presents with non-specific pulmonary symptoms, sputum or tissue samples should be collected immediately for testing so as not to delay treatment. Identification of broad budding yeast in these specimens provide justification for starting anti-fungal therapy.

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WISCONSIN POSTER FINALIST - CLINICAL VIGNETTE Kareem Malas

Barotrauma without the barotrauma: Spontaneous pneumomediastinum and Macklin Effect in a patient with COVID-19 pneumonia

Title

Barotrauma without the barotrauma: Spontaneous pneumomediastinum and Macklin Effect in a patient with COVID-19 pneumonia

Authors

Kareem Malas MS, Corrado Ugolini MD, MPH, Pinky Jha MD, MPH, FACP

Introduction

Spontaneous pneumomediastinum is a rare complication of COVID-19 pneumonia and has only been reported in a handful of people around the world. Of the cases reported, most were secondary to barotrauma-related mechanical ventilation. We present one of the only reported cases of spontaneous pneumomediastinum in a patient with severe COVID-19 pneumonia without preceding barotrauma.

Case Presentation

An 82-year-old woman with a history of OA and asthma presented with 3-week dry cough, SOB, poor appetite, and generalized weakness. She saw her PCP prior to admission and was prescribed prednisone for suspected asthma exacerbation which she took for 2 days without improvement. On presentation, she had a low-grade fever of 100.2°F and SpO2 in the 60s. She had labored breathing with frequent coughs and decreased breath sounds bilaterally. Initial lab work notable for rapid COVID-19 PCR positive, SARS-COV-2-antibody negative, WBC 8300, procalcitonin 0.22, LDH 603, ferritin 1478.0, CRP 3.50, D-Dimer 0.99. CXR showed extensive interstitial thickening and parenchymal opacities throughout both lungs suggestive of COVID-19 pneumonia. The patient was placed on OptiFlow 60% FiO2 40L O2 with improved SpO2 to 95%. She met the criteria for severe disease and was started on dexamethasone 6mg daily, Remdesivir for 5 days, enoxaparin 40mg SQ daily, and prone-ventilation protocol. She received convalescent plasma on HD 2. Her clinical status continued to deteriorate by HD 5, requiring increased OptiFlow to 70% FiO2 50L O2, rising WBC to 16000, and jump in D-Dimer to 10.66. Subsequent CT PE was negative for PE but revealed extensive ground-glass consolidation bilaterally, as well as extensive pneumomediastinum and pneumopericardium most likely

secondary to Macklin Effect. The pneumomediastinum was conservatively managed with general monitoring of respiratory status. A rapid response was called on HD 7 for continued desaturations with tachypnea, prompting further OptiFlow increase to 80% FiO2 60L O2. Given the patient's worsening hypoxic respiratory failure and newly discovered pneumomediastinum, she was transferred to the MICU where she was eventually intubated with mechanical ventilation. She quickly developed worsening hypotension and shock due to COVID-19 ultimately requiring vasopressor support but without clinical improvement. She was switched to comfort cares on HD 19 and passed away the same day.

Discussion

Spontaneous pneumomediastinum is a rare complication of COVID-19 pneumonia that can cause worsening chest pain, SOB, and in rare instances, tamponade and airway compression. Most cases of spontaneous pneumomediastinum are related to barotrauma, usually secondary to mechanical ventilation. Our case presents a unique instance of spontaneous pneumomediastinum in a patient with COVID-19 pneumonia in the absence of preceding barotrauma. The etiology of the pneumomediastinum was attributed to the Macklin Effect: alveolar rupture with dissection of air into the mediastinum. Possible explanations for the alveolar rupture include direct alveolar destruction by the COVID-19 infection and/or increased endobronchial pressure from severe coughing against a closed glottis. Although very rare and usually self-limiting, spontaneous pneumomediastinum should be considered when managing COVID-19 pneumonia even in the absence of barotrauma. Early recognition and conservative management of pneumomediastinum can mitigate worsening of cardiorespiratory function and lead to enhanced clinical outcomes.

WISCONSIN POSTER FINALIST - CLINICAL VIGNETTE Sarah Meeuwsen

A CASE OF SUBCUTANEOUS EMPHYSEMA WITH PNEUMOMEDIASTINUM AND PNEUMOPERICARDIUM IN THE SETTING OF RHINOTILLEXOMANIA AND MEDIAL ORBITAL WALL FRACTURE

Title

A CASE OF SUBCUTANEOUS EMPHYSEMA WITH PNEUMOMEDIASTINUM AND PNEUMOPERICARDIUM IN THE SETTING OF RHINOTILLEXOMANIA AND MEDIAL ORBITAL WALL FRACTURE

Authors

Sarah Meeuwsen, Medical College of Wisconsin Sushma Bangalore Raju, MD, Medical College of Wisconsin

Introduction

Subcutaneous emphysema (SE), pneumomediastinum (PM), and pneumopericardium (PC) can occur due to a myriad of different etiologies. Defined as air introduced into the fascial planes, SE can be traumatic, surgical, iatrogenic, or spontaneous in onset. Typically, a perforation within the gastrointestinal or respiratory tract complicated by emesis, coughing, or Valsalva maneuver results in air forced into the subcutaneous tissues, pericardium, mediastinum, or retroperitoneal space. More rarely, air descends from maxillofacial structures causing these pathologies. This case describes a rare triad of clinical findings which may arise in hospital medicine settings as a delayed result of facial trauma.

Case Presentation

A 32-year-old male with a past medical history of COVID-19 infection, type 1 diabetes mellitus, repeated episodes of diabetic ketoacidosis (last 6 days prior), Staph. aureus bacteremia, rhinotillexomania, and medical non-compliance presented with acute onset facial and neck swelling and pain. On admission, a CT of the facial bone demonstrated extensive soft tissue emphysema of the face and a fracture of the right lamina papyracea. The patient denies any history of trauma, chest pain, shortness of breath, or drug use. A CXR shows extensive subcutaneous emphysema with pneumomediastinum and pneumopericardium, new compared to a CXR completed 5 days prior. A CT esophagogram showed no evidence of barotrauma and the interval development of the right lamina papryacea fracture from a head CT one month

prior, our team suggested the air within the soft tissues is attributed to the ethmoid fracture and exacerbated by repeated nose blowing. His condition was conservatively managed with sinus precautions, and continuation of his current course of antibiotics for his bacteremia. Repeat CXR and CT chest after 3 days of admission showed improvement, and the patient was discharged on day 4.

Discussion

This patient's complicated clinical picture reveals multiple potential etiologies for his triad of clinical findings. There are reports of PM and spontaneous SE as a rare complication of diabetic ketoacidosis. [1] Typically resulting from alveolar rupture secondary to changes in pressure gradients from vomiting and/or Kussmal respirations allowing air to move along the bronchovascular bundle. [2] This patient also has a history of medical non-compliance and is a known poor historian, so we cannot completely rule out trauma to the face or cocaine use, which have also been associated with PM. [3] Most likely, this patient's repeated digital manipulation of the nose caused erosion, followed by fracture to the medial lamina papyracea, a fragile bone on the medial orbital wall. [4] Rathore, et. al reports a case of medial orbital wall erosion secondary to rhinotillexomania complicated by MSSA infections to the soft tissue in the medial orbit. [5] Fractures of the medial orbital wall and ethmoid sinus are more frequently associated with SE than other fractures of the midface. [6] The fracture acts as a ball-valve mechanism, trapping air within the fascial layers. This patient has been known to repeatedly blow his nose as part of his rhinotillexomania, which has been shown to force air into the subcutaneous tissues in the setting of maxillofacial injuries. [7]

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WISCONSIN POSTER FINALIST - CLINICAL VIGNETTE Brooke Olson

Neuroleptic Malignant Syndrome: A Case of Unknown Causation and Unique Clinical Course

Title

Neuroleptic Malignant Syndrome: A Case of Unknown Causation and Unique Clinical Course

Authors

Brooke J. Olson, BS; Mohan S. Dhariwal, DO, PhD

Introduction

Neuroleptic Malignant Syndrome (NMS) is a rare syndrome known to be related to initiation of dopamine antagonist medications. The incidence of this uncommon condition is not well-studied, with estimates ranging from 0.02% to 3% of patients taking antipsychotic medications. While easily recognizable when all classic symptoms are present, the heterogeneity of its clinical course makes this syndrome difficult to identify. Classic symptoms of NMS consist of hyperthermia, muscular rigidity, autonomic hyperactivity, and altered mental status following exposure to neuroleptic medications. With this case report, we present a case of NMS of unclear etiology and unique clinical course.

Case Presentation

A 33-year-old female with a past medical history of developmental disorder with behavioral disturbance presented to our institution with altered mental status. She had an appointment with her psychiatrist two weeks prior to her presentation where her haloperidol regimen was adjusted. Benztropine was also discontinued at this visit. After speaking with the patient's caretakers at her group home, it was unclear how much haloperidol they were administering in addition to her scheduled dosing. The patient had been having slower speech, drowsiness, and drooling which began four days prior to her presentation with progression to lethargy, bowel and bladder incontinence, eventually becoming unresponsive. On admission, the patient was diffusely hyperreflexic with hypertonia. Haloperidol levels were obtained, and results came back unremarkable. Creatinine kinase levels were significantly elevated at 3328 units/L. She experienced undulating fevers with a maximum temperature of 100.4oF. A lumbar puncture and brain MRI were negative. Neurology and psychiatry teams were consulted and therapy with dantrolene was recommended. The day after initiation of dantrolene therapy, hypertonia and hyperreflexia improved with eventual return to baseline function.

Discussion

We present a unique case of NMS of unclear etiology. Our patient had been taking haloperidol for years prior to this event with no addition of new neuroleptic agents for months. Her haloperidol regimen was changed near the onset of her symptoms with suspicion that the patient had been receiving higher dosing than prescribed, but a serum haloperidol level was obtained with unremarkable results. It has also been reported that NMS can result from withdrawal from anti-Parkinsonian medication. In relation to this, our patient was taking benztropine which was discontinued approximately two weeks prior to her presentation. This also could have contributed to her development of NMS. The patient's presenting symptoms fit the defined sequelae of NMS with exclusion of all other possible differential diagnoses. Her presentation of altered mental status which then progressed to muscle rigidity and hyperthermia is classically seen in NMS, although she did not present with any outright symptoms of autonomic dysfunction. Her condition did significantly improve with administration of dantrolene, consistent with NMS. Our case provides insight to the various presentations that can be seen in NMS as well as the various possible etiologies. With this case, we raise the question of whether or not increasing doses of previously prescribed neuroleptic medications can provoke NMS. With greater understanding of the presentation and cause of NMS comes decreased time to recognition and treatment.

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WISCONSIN POSTER FINALIST - CLINICAL VIGNETTE Gopika Senthilkumar

A functional, subcarinal paraganglioma adherent to the left atrial wall and supplied by large branches of coronary and bronchial arteries.

Title

A functional, subcarinal paraganglioma adherent to the left atrial wall and supplied by large branches of coronary and bronchial arteries.

Authors

Gopika SenthilKumar1, Chris K. Rokkas MD2, Paul L. Linsky MD2

Medical Scientist Training Program1, Department of Cardiothoracic Surgery2, Medical College of Wisconsin, Milwaukee WI

Introduction

Mediastinal paragangliomas (PG) are neuroendocrine masses that account for 0.3% of mediastinal tumors1. Functional PGs (secrete catecholamines) are even rarer with only approximately 50 reported cases in the literature2. We report a unique case of a patient with a symptomatic, functional, subcarinal PG that was adherent to the left atrial wall and supplied by a large branch of the right coronary artery (RCA) and bronchial arteries.

Case Presentation

A 35-year-old male presented to the ED with chest pain, seizures, diaphoresis, and hypertension. ECG revealed prolonged QT interval and T wave abnormalities. A highly vascular 5.7cm subcarinal mass was identified on CTA and Dotatate images; labs showed elevated (>3x normal) levels of norepinephrine, normetanephrine, dopamine, and chromogranin A. He was diagnosed with functional paraganglioma and started on terazosin 1mg BID. The dosage was increased to 6mg BID over a month. The patient was also started on 12.5mg BID metoprolol 3wks after ER visit to control catecholamine-related symptoms and minimize intraoperative catecholamine surges. The subcarinal mass was supplied by a large branch of the RCA and bronchial arteries. Thus, a multi-stage resection was planned: (1) blood vessel embolization to protect the RCA and minimize intraoperative bleeding, (2) robotic-assisted thoracoscopy (RAT) for tumor resection. The RCA was successfully embolized. The bronchial artery was not embolized due to high-grade stenosis of the ostium. While mobilizing the tumor via RAT, the

mass was found to be more firmly adhered to the pericardium than suspected based on imaging. To avoid injuring the left atrium, it was decided that an open sternotomy with cardiopulmonary bypass (CPB) would be safer. This was performed the next day, and the tumor and partial left atrial wall were successfully resected. Robotic tumor mobilization greatly increased tumor exposure during the open surgery. Histological examination of the mass revealed a 5.9cm paraganglioma that stained positive for chromogranin, synaptophysin, and S100 and negative for CK AE1/3, confirming the diagnosis of paraganglioma. The patient displayed hemodynamic instability and thus the sternotomy could not be closed until 7 days later. Post-operatively, the patient required temporary respiratory support. He made a full recovery and was discharged 17 days after sternotomy closure, and his labs and symptoms returned to baseline by 4mo post-op.

Discussion

To date, there are only a few reported cases of RAT-assisted resection of posterior mediastinal masses, and none, to our knowledge, were functional PGs with major blood vessel supplies. In 22-30% of patients with posterior mediastinal masses, conversion to open surgery has been reported as a necessary technical step to overcome challenges posed by the difficult anatomical location of the tumors or proximity to cardiac structures3. This case illustrates that a hybrid and multidisciplinary approach involving (1) alpha and beta-blockade, (2) pre-operative embolization of tumor blood supply, (3) RAT-based tumor mobilization, and (4) open resection with CPB can be a safe strategy in the treatment of functional mediastinal PGs that are adherent to cardiac structures and are supplied by major blood vessels. This hybrid approach can help minimize intraoperative bleeding and catecholamine surges while protecting important anatomic structures.

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CHAPTER WINNERS – CLINICAL VIGNETTE

Alabama Clinical Vignette Poster Finalist - Emily Baird

Title

A Case Study Demonstrating Tolerance of the Gut to Large Volumes of Enteral Fluids in Burn Shock

Authors

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Introduction

Initial management of severely burned patients requires aggressive fluid administration, largely achieved through intravenous (IV) access. However, while volumes and types of fluids employed have been hotly debated for some time, there has been little discussion about pursuing alternative routes of fluid administration. Clinical and pre-clinical evidence suggests that enteral or oral resuscitation may effectively complement intravenous fluid administration for burn resuscitation. While this strategy has been discussed in the context of resource-limited settings, its implementation could reduce overall IV fluid requirements during routine care. However, concerns have been raised over impaired gut perfusion and potential adverse side effects (e.g., ileus).

Case Presentation

Here we present a case study of an 82-year-old man with a total burn size of 14% who was encouraged to ingest the oral rehydration solution (ORS) Drip Drop® starting 7 hours post-burn. In the ensuing 17 hours he consumed over 5 L of ORS, which was nearly 1 L more than the total amount of IV fluids he received. During this time, his lactate reduced from 3.4 to 2.4 mmol/L, and hemodynamics were maintained. Moreover, there were no adverse gastrointestinal side effects or vomiting episodes.

Discussion

This case report highlights the safe and effective use of enteral fluids in the resuscitation of a patient in burn shock with the patient's gastrointestinal tract tolerating a large volume of oral fluids without any adverse clinical sequelae. This report and discussion suggest a feasible and readily available adjunct to IV fluids in definitive clinical care.

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Alabama Clinical Vignette Poster Finalist - Aalaap Desai

Title

Cardiac Angiosarcoma with Metastases to the Brain: A Rare Case of a Ruthless Presentation

Authors

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Introduction

With an incidence of 0.0001% in autopsy studies, primary cardiac angiosarcoma is amongst the rarest and fatal subtypes of malignancies. Patients are often asymptomatic in initial stages. By the time symptoms develop, the disease is often advanced leaving few, if any, treatment options. The presented case discusses a young patient with the most commonplace of symptoms, shortness of breath and headache, leading to an inevitable diagnosis of a rare primary cardiac malignancy.

Case Presentation

A previously healthy 26-year-old Caucasian female presented with new-onset chest pain and worsening dyspnea for one month. Imaging showed a large pericardial and bilateral pleural effusions requiring pericardiocentesis and bronchoscopy. The patient then left against medical advice (AMA) preventing additional work-up. She returned one month later with interval worsening of dyspnea and subsequently underwent transbronchial cryobiopsy which showed eosinophilic pneumonia. The patient was treated with pulse-dose steroids prior to leaving AMA again. She returned six weeks later with worsening dyspnea for 3 weeks associated with intermittent hemoptysis as well as a 5-day history of new-onset severe headaches. She was notably hypoxemic requiring supplemental oxygen via nasal canula as well as anemic requiring transfusion. Repeat imaging showed significant interval worsening of cannon-ball lung lesions and a new large mediastinal mass effacing the right atrium. CT and MRI brain showed multiple hemorrhagic intracranial lesions with surrounding vasogenic edema. Due to the rapid disease progression, a comprehensive infectious work-up ensued including fungal, parasitic, and bacterial serologies. Other differentials included malignancy and vasculitis. A cardiac MRI with anesthesia was obtained with plans for biopsy and tissue diagnosis. Shortly after imaging, patient was found to be aphasic with right-sided hemiparesis. Emergent CT head revealed a large parenchymal hemorrhage of the left frontal lobe. She had a decompressive craniectomy and pathology showed angiosarcoma supported by immunohistochemistry revealing strong positive reactivity in the ERG, CD31, and CD34 studies for endothelial cells. Patient remained intubated in the neurosurgical intensive care unit but unfortunately her condition continued to deteriorate.

Given her instability and grim prognosis, few palliative measures were available and her family decided to withdraw care with the patient passing shortly after.

Discussion

In a young previously healthy patient like this with relatively few risk factors and lack of constitutional symptoms, malignancy is often not on the forefront of many clinicians' minds. The rarity of primary cardiac malignancy and its predominance in young male patients make this diagnosis challenging. In this patient, her initial relative stability in combination with the bronchoscopic findings of eosinophilic pneumonia may have served as red herrings. In presenting this case, we hope that future clinicians will consider aggressive primary malignancies such as metastatic cardiac angiosarcoma in patients with similar presentations to improve mortality with earlier intervention.

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California Clinical Vignette Poster Finalist - Shiva Barforoshi

Title

A Rare Case of Steroid-Resistant Neurosarcoidosis of the Cavernous Sinus With Optic Neuropathy: A Case Report

Authors

Shiva Barforoshi, BA; Nikhil A. Patel, BS; Alvin P. Singh, MS; Terrence Li, MD; Benjamin Mba, MD

Introduction

Sarcoidosis is an inflammatory disease that presents with nervous system involvement in 5-10% of cases, commonly known as neurosarcoidosis.1 While there are no randomized controlled trials for the treatment of neurosarcoidosis, expert opinion supports initial treatment with corticosteroids and the use of steroid-sparing or anti-TNF agents in refractory or severe cases.

Case Presentation

A 48-year-old African American male with a past medical history of biopsy-proven hepatic and renal sarcoidosis and progressive headache, dizziness, and blurry vision for 5 months presented with an acute exacerbation of right-sided vision loss over one day. MRI of the brain revealed a dural-based mass extending into the right cavernous sinus and compressing the right optic nerve. Given the pathological confirmation of systemic granulomatous disease consistent with sarcoidosis, clinical manifestations, bilateral hilar and mediastinal lymphadenopathy, MRI findings typical of central nervous system inflammation, and exclusion of other possible etiologies, the patient was diagnosed with probable neurosarcoidosis. Biopsy of the dural-based mass to meet the diagnostic criteria of definite neurosarcoidosis was considered but deferred due to the risk of permanent neurological deficits induced by the procedure.2 In our workup, other pathologies that commonly cause granuloma formation and cavernous sinus lesions were considered, including systemic and CNS infections (e.g., neurosyphilis, tuberculosis, etc.), neoplastic processes (e.g., systemic lymphoma, CNS tumors, etc), and other neuro-inflammatory and autoimmune disorders (e.g., granulomatosis with polyangiitis, IgG4-related hypertrophic pachymeningitis, etc.). Corticosteroids initially resolved his symptoms; however, he suffered an acute relapse. Combination therapy with corticosteroids plus mycophenolate mofetil (MMF) led to the eventual resolution of his symptoms. The patient was instructed to follow up in 1 month for rheumatologic consultation and consideration for initiation of infliximab to minimize long-term steroid toxicity.

Discussion

Only 8 cases of neurosarcoidosis involving the cavernous sinus have been reported. 3-8 Expert opinion and small retrospective studies support early, aggressive treatment for severe cases of

neurosarcoidosis, as relapses are frequent.1 Our patient represents the only reported case of probable neurosarcoidosis of the cavernous sinus with optic neuropathy successfully treated with corticosteroid plus MMF combination therapy. This case presentation supports the need to develop criteria for classifying patients with neurosarcoidosis into mild, moderate, and severe cases to guide treatment decisions. These criteria may be based on neurolocalization and the degree of neurological disability, with the notable exception of isolated facial nerve paralysis, which can most often be treated with only a few weeks of prednisone monotherapy and rarely recurs. Given its potentially devastating neurological consequences, we would classify optic neuropathy as a severe case of neurosarcoidosis, similar to cases of spinal cord disease. In severe cases of neurosarcoidosis, steroids and steroid-sparing agents in addition to anti-TNF agents, especially infliximab, are initiated earlier on in the course of treatment.1 Presumably, our patient's optic neuropathy would have resolved sooner with earlier initiation of corticosteroid and MMF combination therapy and/or infliximab. We highlight the need to consider early, aggressive treatment in cases of neurosarcoidosis with optic neuropathy and to develop criteria to guide treatment strategy based on neurolocalization and the degree of neurological disability.

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California Clinical Vignette Poster Finalist - Sumeet Brar

Title

Multiple Etiologies of Pulmonary Hypertension

Authors

Sumeet Brar

Introduction

Pulmonary hypertension has a diverse range of etiologies. A thorough and complete evaluation to determine the primary etiology is necessary to provide proper treatment.

Case Presentation

A woman in her 40s with a complex medical history presents with worsening dyspnea on exertion. She has systemic lupus erythematosus complicated by lupus nephritis, nephrotic syndrome, secondary Sjogren's syndrome, and fibromyalgia. In addition, she has recurrent pulmonary emboli, multiple episodes of pneumonia, sickle cell trait, and asthma. Notably, she has had a stable, large pulmonary embolus in her right lower pulmonary artery for several years. The patient's previous right heart catheterization 2 years prior demonstrated elevated pulmonary artery pressures consistent with pulmonary hypertension. However, a pulmonary angiogram was not performed at this time because the patient was lost to follow-up. During the present admission, the patient underwent another right heart catheterization, which demonstrated worsening pulmonary hypertension as well as signs of right heart enlargement and decreased ejection fraction. In addition, a pulmonary angiogram was simultaneously performed. It revealed the major etiology of her pulmonary hypertension was small vessel disease secondary to lupus and not chronic thromboembolism. She was started on an infusion of epoprostenol, a synthetic analogue of prostacyclin.

Discussion

Determining the appropriate etiology of pulmonary hypertension is crucial since there are vastly different treatments for each etiology. Pinpointing a specific etiology can be difficult when a patient has multiple comorbidities that can each contribute to the pathogenesis of pulmonary hypertension, such as in this case. Both the patient's lupus and chronic pulmonary embolism could be likely etiologies. Lupus can cause small vessel disease in which endothelial dysfunction results in hyperplasia of both the intima and media. Chronic pulmonary emboli result in vascular remodeling secondary to increased shear forces in occluded vessels. A pulmonary angiogram can distinguish between the two etiologies, as the pulmonary vascular resistance will be markedly elevated relative to the degree of obstruction in pulmonary hypertension secondary to small vessel disease. Pulmonary vasodilators such as prostacyclin analogous have the most evidence in treating pulmonary hypertension caused by small vessel disease. Epoprostenol results in

pulmonary vasodilation through both direct and indirect mechanisms, in addition to having anti-inflammatory and anti-thrombotic properties. Unfortunately, those with an underlying connective tissue disease have a worse prognosis than those with idiopathic pulmonary hypertension. If the patient's chronic pulmonary embolus was determined to have been the major etiology, a thromboendarterectomy would have been indicated instead.

California Clinical Vignette Poster Finalist - Tina Huang

Title

Refractory Hypokalemia and Ectopic ACTH in Small Cell Lung Cancer

Authors

Tina Q. Huang, Gavin Ho, Tyler Larsen

Introduction

Small cell lung cancer (SCLC) is an aggressive malignancy associated with paraneoplastic syndromes such as ectopic Cushing's syndrome (ECS), syndrome of inappropriate ADH secretion, and parathyroid related hormone secretion. Acute metabolic abnormalities, such as refractory hypokalemia, should raise suspicion for ECS.

Case Presentation

A 72-year-old man presented to the emergency department with swelling of all four extremities and severe dyspnea. One week prior to his presentation, the patient was diagnosed with small cell lung cancer. The patient was diagnosed with acute hypoxic respiratory failure and superior vena cava syndrome secondary to progressive SCLC and admitted to the hospital. Admission labs were notable for a severe hypokalemia to 2.3 mEq/L and a new metabolic alkalosis. He was treated for several days with oral and intravenous potassium chloride, but his hypokalemia only modestly improved. An afternoon cortisol level was elevated to 61.5 mcg/dL. Elevated ACTH and morning cortisol indicated likely ACTH-dependent hypercortisolism. Dexamethasone administration failed to suppress cortisol levels (AM cortisol 47mcg/dL), indicating a likely ectopic source. Endocrinology recommended a pituitary MRI, which showed potential 1.4 mm microadenoma. However, this was ultimately inconclusive as the suspected adenoma was too small to be evaluated without additional imaging, which the patient declined. Given the recent diagnosis of SCLC, refractory hypokalemia, metabolic alkalosis, and lack of cortisol suppression post-dexamethasone test, hypokalemia was suspected to be secondary to hypercortisolism from ectopic ACTH secretion from small cell lung cancer. Urgent chemotherapy (carboplatin/etoposide/atezolizumab) was initiated in the hospital with close monitoring for tumor lysis syndrome, which did not occur. The patient's extremity swelling improved modestly with chemotherapy. Potassium improved to 3.1 at discharge with daily PO repletion. The patient was discharged with plans for continued chemotherapy and palliative radiation for his SVC syndrome. He was discharged with supplemental potassium, which was eventually tapered down with resolution of hypokalemia as an outpatient.

Discussion

Since being reported by Brown in 1928, limited presentations of ECS in the setting of SCLC have been described. Recognition of this paraneoplastic syndrome in SCLC is important for

prognosis staging of SCLC as well as effective correction of electrolyte derangements of paraneoplastic processes. In this patient, hypercortisolism secondary to ectopic ACTH secretion caused refractory hypokalemia. Ectopic ACTH caused the elevated levels of hypercortisolism observed in this case. Cortisol has possible mineralocorticoid activity in renal tubules, but is usually inactivated to cortisone via 11ß hydroxysteroid hydrogenase type II activity. However, elevated levels of cortisol overwhelm inactivation of cortisol to cortisone. As a result, cortisol binds to mineralocorticoid receptors, causing the persistent hypokalemia found in this patient. Refractory hypokalemia is a relatively rare presentation of hypercortisolism secondary to ectopic ACTH secretion, and diagnosis of ECS in the setting of SCLC has important implications for patient prognosis.

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California Clinical Vignette Poster Finalist - Yvonne Lu

Title

Antibiotic Spacers as a Cause of Hypercalcemia

Authors

Yvonne Lu, BS; Khwaja Hamzah Ahmed, BS; Maryam Rahimi, MD

Introduction

Hypercalcemia may present with a wide range of symptoms, including abdominal, psychiatric, or bone issues. Calcium regulation is a complicated process influenced by a number of variables, of which parathyroid hormone is the most prominent. However, in the absence of a parathyroid disorder, the etiology of hypercalcemia can be difficult to discern. In this case, we examine a post-surgical patient with an initially unclear etiology of hypercalcemia.

Case Presentation

A 65-year-old male presented to clinic for post-hospitalization follow-up. Medical history was significant for hypertension and bilateral hip osteoarthritis with an uncomplicated left hip replacement. In June 2018, the patient had a right hip replacement complicated with MSSA infection requiring multiple IV antibiotic courses. In December 2018, he had a fall requiring open reduction and internal fixation of the right hip. This was complicated with hardware-associated osteomyelitis, prompting placement of an antibiotic spacer in January 2019. Due to continued infection, a second antibiotic spacer was placed in April 2019. He was hospitalized twice in April and August of 2019 for abdominal pain and constipation, and was diagnosed with hypercalcemia and acute renal failure. The etiology of his renal failure was not apparent at this time, and it was unclear whether hypercalcemia was the cause of his renal failure or vice versa. Common causes of acute renal failure and hypercalcemia such as multiple myeloma, sarcoidosis, and malignancy were ruled out. Bone turnover, seen in osteoporosis, is another cause of hypercalcemia and is often evaluated by bone biopsy. However, the patient did not wish to undergo a bone biopsy and opted for serum bone turnover markers such as C-telopeptide (CTX) assays. He was found to have elevated CTX levels, but a bone density scan did not show osteoporosis. The patient continued to be treated with oral and IV fluids until his calcium and renal function stabilized around November 2019, and repeat x-rays showed resolution of the antibiotic spacer beads.

Discussion

Given that the common etiologies of hypercalcemia and renal failure were ruled out, the patient's presentation was likely related to his antibiotic spacers, which were loaded with calcium-sulfate-antibiotic beads. Currently, the side effects of antibiotic spacers reported in the literature are mostly mechanical, such as fracture or displacement. Systemic side effects are less commonly

reported, highlighting an area for further study. Additionally, while bone turnover markers such as CTX may help identify cases of high bone turnover such as in osteoporosis, the usage of such markers may be limited in cases of kidney failure given that the markers are renally excreted. This case showcases the importance of keeping antibiotic spacers in the differential when working up hypercalcemia, especially in a complicated post-operative patient.

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California Clinical Vignette Poster Finalist - Kathryn Park

Title

A rare cause of peripheral neuropathy in a young healthy immigrant patient

Authors

Kathryn Park BA, University of California San Diego School of Medicine Jessica Xiao BS, University of California San Diego School of Medicine Bernice Ruo MD MAS FACP, University of California San Diego School of Medicine, Division of General Internal Medicine, UCSD Health

Introduction

Nitrous oxide abuse is an uncommon cause of vitamin B12 neuropathy. As nitrous oxide use increases worldwide, it should be considered as part of the differential for peripheral neuropathy.

Case Presentation

A 21-year-old Chinese male with no past medical history presented to clinic with one-month history of numbness in bilateral hands and lower extremities. Patient reported sudden onset numbness of constant and stable severity. He noted unsteadiness with walking and difficulty with jumping. He also noted erectile dysfunction with rare morning erections. He denied headaches, vision changes, paresthesia, weakness, dizziness, recent trauma or infection, new medications, or alcohol use. Physical exam demonstrated some instability with tandem walking, negative Romberg's test, and deep tendon reflexes that were difficult to appreciate. Muscle strength and tone, pain and temperature sensation, and proprioception were preserved. Upon further questioning, the patient reported daily nitrous oxide use for one year and stopped using when the symptoms started. However, there was no change in symptoms with cessation. Laboratory testing was remarkable for low vitamin B12 levels (<150) and megaloblastic anemia (Hgb 13.3, MCV 97.0). TSH, HgbA1c, and BMP were normal. Our patient was diagnosed with peripheral neuropathy secondary to nitrous oxide-induced vitamin B12 deficiency and started on 2000 mcg of daily vitamin B12 supplementation. The patient did not have health insurance and ultimately did not follow up.

Discussion

Nitrous oxide is a colorless, chemically inert gas, typically used as an anesthetic in the medical or dental setting. Recreational use of nitrous oxide, known as whippets, is increasing worldwide; nitrous oxide is the second most popular recreational drug after cannabis in the United Kingdom, and its use has sharply increased in China since 2016. Heavy or sustained abuse of nitrous oxide can lead to rapid inactivation of vitamin B12. This causes irreversible inhibition of methionine synthase, preventing generation of methyl groups for synthesis of DNA, RNA, and myelin. Patients can present with peripheral neuropathy, sensory ataxia, encephalopathy, psychosis, and

subacute combined degeneration syndrome. Dysautonomia, including erectile dysfunction, is a less common manifestation of vitamin B12 deficiency but has been reported in case reports as a presenting symptom of nitrous oxide abuse. While there is no established treatment for nitrous-oxide induced vitamin B12 deficiency, treatment typically includes vitamin B12 supplementation orally or intramuscularly and abstinence from further nitrous oxide inhalation. Neurological effects of nitrous oxide abuse are potentially reversible, and prognosis is good with early intervention; however, improvement can take months. Some patients may only partially recover and have permanent sequelae. Peripheral neuropathy has a wide variety of causes, including systemic disorders, drugs and toxins, and genetic conditions. The most common etiologies are diabetes mellitus, alcohol abuse, and HIV infection. Our case demonstrates the importance of a thorough social history and recognizing nitrous oxide abuse as part of the differential for peripheral neuropathy.

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Delaware Clinical Vignette Poster Finalist - Praneeja Matta

Title

Levamisole: The (Skin) Cutting Agent in Cocaine

Authors

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Introduction

Levamisole is an anthelmintic agent but is commonly used as an adulterant in cocaine. It is found in approximately 70% of cocaine in the United States.[1,2] Levamisole's white powder formulation, theorized cholinergic stimulation, and amphetamine-like psychostimulatory properties make it an ideal diluting agent for cocaine.[1] Unfortunately, levamisole has several side effects, including agranulocytosis, leukopenia, vasculitis, and dermal necrosis. This is a case of severe levamisole-induced vasculitis (LIV) requiring extensive skin grafting.

Case Presentation

A 35-year-old female with a history of cocaine use disorder and hepatitis C was admitted to the hospital for pain control and workup of a progressive, painful rash. The patient had prior episodes of these rashes in smaller distributions, which had resolved spontaneously. In the current episode, the rash started as small areas of erythematous, non-blanching lesions that rapidly progressed to large, coalescing, purpuric plaques, some with overlying bullae, on her hands, arms, legs, ears, chest, and left foot. Initial labs demonstrated an elevated ESR and CRP with positive perinuclear anti-neutrophil cytoplasmic (p-ANCA), anti-proteinase-3 (PR3), and anti-myeloperoxidase (MPO) antibodies. Cytoplasmic anti-neutrophil antibody (c-ANCA) was negative. Cryoglobulins were positive, however hepatitis C virus PCR was negative, and the patient's history of hepatitis C was felt to be non-contributory. Punch biopsy of a lesion demonstrated thrombotic vasculopathy, consistent with LIV. Before steroid treatment was initiated, the patient left against medical advice, only to return two weeks later with worsening necrotic wounds. Labs at this time demonstrated a new leukopenia and neutropenia. The patient was started on high-dose prednisone with resolution of some of her smaller wounds. Her three-week hospital course was complicated by a polymicrobial superficial wound infection and the need for five surgical wound debridements. She was ultimately discharged on a prednisone taper with plastic surgery follow-up for skin grafting.

Discussion

First described in the 1970's, LIV involves a characteristic clinical presentation of vasculitis with varied lab findings. The associated retiform purpura typically involves the ears, but can also present on the nose, cheeks, trunk, and extremities.[2,3,4] Cutaneous manifestations may also include necrosis, abscesses, and bullae. Notably, LIV has a unique autoantibody profile. The majority of cases have p-ANCA (88%-100%) and MPO (66-100%) antibodies, while PR3 and c-ANCA antibodies are present in about 50% of cases.[2,3,4] The skin lesions typically resolve spontaneously within 2-3 weeks of drug discontinuation and recur with subsequent levamisole exposure. In severe cases when full-thickness skin necrosis is present, surgical debridement, grafting, and specialized wound care may be required. The role of corticosteroids is controversial, although they are often utilized as an adjunct in patients with progressive skin disease or systemic involvement.[5] Clinicians should maintain a high index of suspicion for this diagnosis in patients with a recent history of cocaine use.

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Florida Clinical Vignette Poster Finalist - Paul K Gursky

Title

DETECTION OF AMPULLARY CANCER WITH COLOGUARD®: CASE REPORT

Authors

Paul Gursky, Bryan Pacheco, William Butler, Melodie Mope M.D

Introduction

Ampullary carcinoma is a distinct neoplasia comprising histological and oncogenic features of both colorectal and pancreatic malignancy AVC's unique pathological properties, including location, small size, and low prevalence, have caused challenges with the development of structured guidance for diagnosis and management. Screening for malignancy through fecal DNA testing is increasing in use and accuracy Cologuard is one such test which uses fecal DNA to screen for colorectal carcinoma and adenomas, known commonly as a FIT-DNA multitarget stool DNA test (MT-sDNA) However, malignancies present in the upper gastrointestinal tract, including ampullary carcinoma, are capable of being detected through various DNA markers, including KRAS, p53, APC, and BMP3

Case Presentation

A 70 year old female presented to her urologist with right flank pain and hematuria. An abdominal and pelvic CT revealed a right kidney stone and incidentally discovered a moderate, 8.5 mm dilation of the common bile duct with stricture. Further ultrasound of the right upper quadrant, MRCP, and laboratory findings were inconclusive. Follow up with her PCP also showed a recent positive Cologuard® test, prompting referral and follow up with gastroenterology for colonoscopy and Esophagogastroduodenoscopy. Colonoscopy was negative for occult lesion, but EGD displayed prominent partially obstructing mass on the duodenum. Biopsy with ERCP and histological analysis indicated primary ampullary malignancy with KRAS, APC and BMP3 mutations. A PET scan revealed metastasis to the lungs. Clinically the patient presented without symptoms until late into the course of her treatment. The patient went through chemotherapy and succumbed to her condition two years later. Given the stage of her cancer her original prognosis was three months.

Discussion

AVC is a cancer of multiple epithelial origins, comprised of intestinal epithelium and pancreaticobiliary epithelium Fecal DNA testing (Cologuard) has been designed to identify colorectal carcinoma utilizing mutations associated with early stage colon carcinogenesis, particularly KRAS, APC, BMP3, and p53 Gene mutations TP53, KRAS, and APC are associated with specific subtypes of AVC As was possibly the case with our patient, DNA markers currently being utilized to identify CRC and advanced adenomas of the lower GI tract are

capable of recognizing carcinomas of the upper GI tract. No study has yet been conducted with regards to AVC; however, reactivity of Cologuard to cancers within the GI tract, including the liver and pancreas, has been noted. Current recommendation for positive MT-sDNA and negative colonoscopy is to return to a routine screening schedule

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Georgia Clinical Vignette Poster Finalist - Brittany S Tummings

Title

The Fluidity of Fluid: Overload in Heart Failure from a Non- Cardiac Cause

Authors

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Introduction

Ascites refers to buildup of fluid within the peritoneal cavity. It is commonly caused by portal hypertension and may be a sign of volume overload in patients with right-sided heart failure. Herein we present a case of a man with heart failure who had ascites initially responsive to management for heart failure, but who later represented with worsening abdominal distention. Further work up revealed an unexpected diagnosis.

Case Presentation

A 75 year old African American man with medical history of Heart Failure with Reduced Ejection Fraction (25%), End-Stage Renal Disease (ESRD), and recent admission for Heart Failure exacerbation represented in 5 days with increased abdominal distention concerning for volume overload. The patient endorsed a rapid increase in abdominal fullness with shortness of breath, despite previous diuresis. On presentation his vitals were within normal limits. Physical examination was significant for massive ascites. Prior ascites fluid analysis revealed Serum Albumin Ascites Gradient (SAAG) <1.1 mg/dl, protein >2.5g/dL but ascites was now resistant to diuresis and heart failure management. During this index admission, repeat ascitic fluid analysis showed similar results as previous paracentesis with negative fluid cultures and cytology negative for malignancy. Work up for TB was negative. Serum protein electrophoresis and urine electrophoresis was negative for cancer. Computed tomography (CT) abdomen showed liver nodularity, suggestive of newly diagnosed cirrhosis. Iron studies revealed high ferritin levels and liver biopsy was performed. Histopathology revealed grade 3 septal fibrosis and parenchymal iron stained Kupfer cells, reflecting diagnosis of hemochromatosis. HFE genetic screening was negative. Given his anemia, he was a poor candidate for phlebotomy and patient was discharged for outpatient follow up Gastroenterology and Hematology for non-hereditary hemochromatosis.

Discussion

Hemochromatosis refers to increased iron absorption and deposition in the liver that can lead to multisystem organ failure. Hereditary Hemochromatosis (HH) is common among Caucasians and typically results from autosomal recessive HFE gene mutation. Non-hereditary

hemochromatosis may result from disorders of erythropoiesis or blood transfusions. However, this African American patient had two negative genetic screenings. Iatrogenic iron from transfusions during hemodialysis likely contributed to non- hereditary hemochromatosis in this patient. Hepatic iron overload may manifest hepatic fibrosis which can progress to cirrhosis, as in this case. First- line therapy for hemochromatosis is routine phlebotomy but in this case was not the best option given this patient's anemia. Hematology considered iron chelating agents as second line therapy. The diagnosis in this case was masked by heart failure but histopathology was key to revealing the diagnosis and should be employed in similar cases.

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Idaho Clinical Vignette Poster Finalist - Ryan Day

Title

Argh Me Toe Hurts: Bachelor Scurvy

Authors

Ryan Day MS4, University of Washington Carlee Fountaine MD, University of Washington Boise Internal Medicine Residency

Introduction

Ascorbic acid (vitamin C) is an essential micronutrient for humans. It is necessary for epithelial barrier function and plays important roles in the function of the immune system. Ascorbic acid deficiency, also known as scurvy, results in an acquired connective tissue disorder of impaired collagen synthesis.

Case Presentation

A 74-year-old gentleman presented with a chief complaint of pain in his right hallux. He reports throbbing pain for several months and three weeks of dizziness, lightheadedness and multiple ground level falls. His past medical history was notable for diabetes and alcohol use disorder. On presentation, he was afebrile and hypotensive. The physical exam was notable for an erythematous and edematous forefoot and right hallux with nail removed and bone exposed. Other exam findings included temporal wasting, abdominal hairs with a corkscrew-like appearance, chronic excoriations on multiple extremities, and numerous scattered ecchymosis. Initial labs and images suggested osteomyelitis of the toe with severe peripheral vascular disease in the right leg. His skin findings and temporal wasting were concerning for nutritional deficiency. A Vitamin C level was drawn, and he received empiric nutritional supplementation with Vitamin C, Vitamin D3, Thiamine and a multivitamin in addition to treatment for osteomyelitis. His Vitamin C level resulted as undetectable. Further history revealed a one-year diet of strictly canned foods and beer. He received right lower extremity revascularization and hallux amputation along with vitamin supplementation and full diet. He gained over 20 pounds with reduction of scattered ecchymosis and resolution of dizziness.

Discussion

Presenting symptoms of scurvy are variable, but classic findings include petechia, ecchymoses, perifollicular hyperkeratosis or hemorrhage, corkscrew hairs, gingivitis, poor wound healing, and depression. Scurvy is likely underrecognized as studies have shown it is common in patients with alcohol use disorder. Diagnosis of scurvy is made with a combination of dietary history, low serum vitamin C levels and resolution of clinical manifestation after treatment with ascorbic acid. This case presents two unique learning opportunities. First, the patient is a prime example of the concept of “Bachelor Scurvy”, a condition described in unpartnered men newly

responsible for preparing their own meals combined with alcohol consumption and a diet virtually void of fruits and vegetables. Secondly, this case is a reminder of how social determinants of health can affect the elderly male veteran population to increase the risks of nutritional deficiencies. Exploring nutritional status in hospitalized, geriatric veterans is time well spent with ample opportunity for patient education.

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Illinois Clinical Vignette Poster Finalist - Thomas C King

Title

Recurrent Cryptogenic Stroke Complicated by Endocarditis - Looking Beyond the Common Differential

Authors

Authors: Thomas King, Maria Isabel Camara Planek MD, Gianna Bosco MD, Nicole Cornet, Clay H Hoster MD, Gatha Nair MD, Celine Goetz MD

Introduction

Lambl's excrescences are filiform fronds that form at sites of valvular closure, and are a rare but important cause of thromboembolic disease. We were presented with a patient who had multiple complicated medical issues including Lambl's excrescences that presented an array of problems in management.

Case Presentation

A 53 year old female with past medical history of lupus, heart failure, DVT with recurrent PE, intracranial hematoma, prior cryptogenic stroke presented with endocarditis, MRSA bacteremia, and DVT. Upon presentation, she had altered mental status and physical exam was remarkable for upper extremity weakness. MRI brain showed small acute infarcts in the left frontoparietal region. For further endocarditis workup, she underwent transthoracic echocardiogram (TEE) which showed a small, mobile mass on the left ventricular aspect of the aortic valve concerning for both Lambl's excrescences (LE) and endocarditis vegetation also appreciated on the tricuspid and mitral valves, along with a patent foramen ovale (PFO). We felt that the clinical picture was best explained by embolic stroke phenomena due to the LE, endocarditis vegetations, and PFO appreciated on the TEE. Management of LE was complicated in two ways. First, the patient was unable to be anticoagulated due to GI bleed and intracranial hematoma. Secondly, the patient was deemed to not be a surgical candidate for the endocarditis and ultimately with patient and family discussion, decided to proceed with antibiotics and hospice care.

Discussion

LE are an uncommon cause of thromboembolism and stroke. They are thought to be due to endothelial damage along the high stress closure lines of the aortic and mitral valves. Most patients are asymptomatic, however lesions on the aortic valve are the most common culprits in LE causing stroke. TEE is the gold standard for diagnosis (1). LE should be considered in the differential diagnosis of any cryptogenic stroke. In our patient's case, etiology of stroke was most likely multifactorial. Her simultaneous MRSA tricuspid and mitral endocarditis, PFO, and presumed aortic valve endocarditis with LE resulted in difficult management of the case. There was no known etiology of her prior cryptogenic stroke prior to admission, suggesting LE as a

possible culprit. Though data is sparse in the management of LE, current consensus from a recent review of 27 identified cases of LE suggests that patients with a first episode of stroke due to LE should be managed with dual anti platelet therapy or anticoagulated with warfarin (2). Those with subsequent episodes should be considered for surgical intervention. In this case, these were contraindicated. LE is an uncommon, yet important cause of cryptogenic stroke. Our case highlights the complexity of managing LE in the context of anticoagulation contraindication and endocarditis, the importance of multidisciplinary management, and the need for higher-powered studies to validate current diagnosis and management.

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Kentucky Clinical Vignette Poster Finalist - Nicholas Butler Jr

Title

The Tell-Tale Heart: A Carcinoid Complication

Authors

Nicholas Butler, M3 Chandler Park, MD, FACP

Introduction

When most physicians hear "carcinoid syndrome," the following buzzwords come to mind: skin-flushing, GI distress, bronchospasm, and hypotension. What is less known about carcinoid syndrome is its frequent and sometimes initial cardiac involvement.

Case Presentation

An eighty-year old female with previous diagnosis of carcinoid syndrome presents to primary care physician with worsening dyspnea. On physical exam, a high pitched holosytolic murmur is heard best at the left lower sternal border. She is found to have extensive hepatic disease. Her workup for a cardiovascular pathology includes an echocardiogram which reveals significant backwards flow from the right ventricle into the right atrium during systole leading to a functional diagnosis of severe tricuspid regurgitation. The obvious question is whether this significant tricuspid dysfunction can be traced back to a less-common primary valvular disease like rheumatic fever, endocarditis, etc. or the more-common secondary etiology such as pulmonary hypertension or left-sided valvular disease. Interestingly, the initial echocardiogram demonstrates thickened and retracted tricuspid leaflets. Future investigation would reveal she had normal right ventricular size and function, mild pulmonary valve regurgitation with no stenosis, normal left ventricular chamber size, and a left ventricular fraction of 72% making heart failure from a secondary cause unlikely. The patient was diagnosed with carcinoid heart disease: a manifestation of carcinoid syndrome and characterized by deposits of pathognomonic plaques within the heart. As a result of her right-sided heart failure, she required a prosthetic tricuspid valve replacement which today remains the only effective therapy. Post-op resulted in minimal tricuspid regurgitation and today her carcinoid disease is controlled on octreotide (a somatostatin analogue).

Discussion

Carcinoid heart disease occurs in up to half of patients with carcinoid syndrome and may be the first manifestation of a carcinoid tumor in up to 20%. A mayo clinic study found that within a sample of confirmed carcinoid heart disease, plaque-induced tricuspid regurgitation was present in all patients. Surgical valve replacement is indicated when the dysfunction becomes symptomatic as in this case. Given the high incidence of carcinoid heart syndrome within the carcinoid syndrome population and the grim prognosis of untreated disease (median survival 11

months) it is prudent to both be aware of carcinoid heart disease as a primary valvular pathology and as a life-threatening complication of established carcinoid syndrome. Regular evaluations for valve disease and heart failure are currently recommended for patients such as the one described. It is very important to listen to every carcinoid syndrome patient with a stethoscope to pick up heart murmurs.

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Kentucky Clinical Vignette Poster Finalist - Victoria B Thompson

Title

May-Thurner Syndrome: An Uncommon Case of Pediatric Thrombosis

Authors

Victoria Thompson, MS4 Jordan LeJeune, MD

Introduction

May-Thurner Syndrome (MTS) is an anatomic variant in which the right iliac artery compresses the left common iliac vein against the spine. This condition is found in around 24% of the population and thought to be present in 18-49% of those with a left lower extremity deep vein thrombosis (DVT).[1] In the pediatric population, MTS is diagnosed in 0.07 to 0.14 per 100,000 patients and presents most commonly as an acute thrombotic event of the left lower extremity.[2] Due to the low incidence of this condition, there are limited studies as to treatment efficacy, anticoagulation use, and long-term follow-up of pediatric patients with MTS. Through this report of a case of MTS in a 17-year old patient, awareness will be brought to this rare condition in pediatrics and call for more research and studies to guide future management and follow-up for May-Thurner Syndrome in pediatrics.

Case Presentation

In this study, we report a 17-year old girl without a significant past medical history who presented with deep vein thrombosis secondary to MTS. Treatment in this case was coordinated with a pediatric hospitalist, interventional radiology, and consultation with a pediatric interventional radiology team. Diagnosis was made with CT and ultrasound imaging. Anticoagulation was performed with IV heparin, thrombolysis with heparin and TPA, and endovascular stent placement was performed to decrease risk of recurrence. Venography following placement was performed and patency confirmed. A work-up for thrombophilias was ordered to investigate hypercoagulable state and came back within normal limits. Management of this case was guided by adult protocols and studies. Patient tolerated the treatment plan in the hospital well and was discharged on hospital day 11, anticoagulated on Xarelto with instructions to follow-up with her primary care provider at time intervals 1,3,6,9, and 12 months for repeat ultrasounds.

Discussion

The research that guides diagnosis, treatment, and follow-up for pediatric patients diagnosed with MTS largely follows adult practice standards. Due to the rare occurrence of this syndrome, most of the research in pediatrics has been limited to case reports and research on pediatric DVT

in general. This case report adds to the body of evidence for presentation of acute thrombosis in pediatric patients with MTS and calls for more research-guided treatment and guidelines for follow-up. In the adult population, one study of 59 patients with a mean age of 39 showed an underlying thrombophilia in 67% of the patients in the presence of MTS requiring endovascular intervention.[3] In pediatrics, 90% of DVT presentations have been associated with an underlying thrombophilia, but this research did not look at MTS specifically.[4] Recommendation for anticoagulation are also based largely on adult studies, although some pharmacokinetic factors have been shown to be age-dependent and due to antithrombin concentrations, resulting in higher doses of unfractionated heparin to maintain a therapeutic aPTT in pediatrics.[5] In otherwise healthy children, anti-coagulation is typically continued for 6-12 months following thrombosis (in the absence of a thrombophilia).[6] With further research in the pediatric population, guidelines can be developed for treatment of pediatric MTS and long-term follow-up.

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Massachusetts Clinical Vignette Poster Finalist - Rebecca A Scharf

Title

Can it be Creutzfeldt-Jakob Disease?: Diffuse Large B-Cell Lymphoma Disguised by Clinical Signs of CJD

Authors

Rebecca Scharf, BS (Tufts University School of Medicine) Laura K. Snydman, MD (Division of General Internal Medicine, Tufts Medical Center)

Introduction

Although CNS lymphoma typically presents as a well-demarcated brain mass, patients can present atypically with absence of a solitary mass on imaging and with symptoms mirroring that of CJD.

Case Presentation

A 76 year-old man with a history of Crohn's disease, COPD, and hypertension presented with five months of subacute worsening of altered mental status, hallucinations, weight loss, and fevers. Physical exam was notable for positive startle reflex, positive frontal signs (hand grip and sucking reflex), and positive Babinski. CT head was negative for an acute process. Due to initial concern for meningitis and/or encephalitis, the patient was empirically started on Vancomycin, Ampicillin, and Acyclovir. MRI brain showed only mild volume loss and chronic microangiopathy. MRA head/neck was unremarkable. Lumbar puncture revealed 132 WBCs with lymphocytic predominance of 91%, glucose 28, and protein 120 with negative gram stain/cultures and cytology. Molecular infectious testing of the CSF for JC polyoma virus DNA, VZV DNA, HSV 1/2 DNA, Lyme DNA, EBV DNA, CMV DNA, and GeneXpert PCR for tuberculosis were negative. CSF Cryptococcus antigen and serologies of Powassan, West Nile, Eastern Equine Encephalitis viruses were negative. Serum Lyme IgM/IgG, Ehrlichia/Anaplasma PCR, HIV Ab, RPR, and Quantiferon were negative. EEG was unremarkable. On admission, the patient was speaking intermittently, but by hospital day 10 was making only unintelligible noises. Given the patient's clinical picture and rapid deterioration with a grossly negative workup, there was concern for Creutzfeldt-Jakob Disease (CJD). Serum 14-3-3 eta protein was mildly elevated at 0.4 (normal <0.2); however, this was a nonspecific finding. Repeat MRI brain on hospital day 17 showed multiple new hyperintense enhancing lesions in the right parietal lobe, left centrum semiovale, body of corpus callosum, and right medial temporal lobe. CSF from repeat LP for real-time quaking-induced conversion (RT-quic), a highly sensitive and specific test for CJD, was negative. Unfortunately, the patient expired after 26 days of hospitalization. Post-mortem western blot came back negative for CJD. Brain biopsy revealed

Diffuse Large B-Cell Lymphoma involving the cerebellum, brainstem, basal forebrain, basal ganglia, thalamus, hippocampus, amygdala, cerebral cortex, and leptomeninges.

Discussion

This case illustrates an atypical presentation of CNS lymphoma. Although it commonly presents as a solitary, well-demarcated brain mass, absence of a single mass does not rule out CNS lymphoma. It can also present with periventricular lesions (including the corpus callosum) and lesions in the parietal, temporal, frontal, and occipital lobes. CSF studies can help provide diagnostic information for the diagnosis; CNS lymphoma typically presents with a lymphocytic pleocytosis, elevated protein, and low-normal glucose, which were consistent with the CSF results in this case. In one-third of cases, CSF cytology may not show malignant cells. Diagnosis can be made definitively with ocular biopsy (if ocular involvement is present) or CSF studies. If diagnosis is still unclear, brain biopsy is diagnostic. In this case, brain biopsy was deferred due to concern for CJD and limitations regarding reusable instruments.

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Minnesota Clinical Vignette Poster Finalist - Jenna Ruggiero

Title

Golfer's Vasculitis: Exercise-Induced Vasculitis on the Feet of a Male Golfer

Authors

Jenna L. Ruggiero, BS, Sara A Hylwa, MD, Matthew Mansh, MD

Introduction

Exercise-induced vasculitis (EIV) is a common condition but is under-recognized and often misdiagnosed. EIV is a small vessel vasculitis of the lower extremities induced by exercise, especially in hot conditions (1). As extensive walking is the most common trigger, EIV is also referred to as golfer's rash/vasculitis (2). It occurs most commonly in healthy individuals over the age of 50; however, it has been reported in children in association with sporting activities (3). While many types of cutaneous vasculitis may be exacerbated by activity, EIV is induced by physical activity with complete skin clearance outside of the exercise (4). The first case of EIV was described in 1996 in a woman with urticarial vasculitis after exercise (5). Since then, EIV has been increasingly reported (6-8). The pathogenesis is poorly understood, and while further study is needed, EIV is a benign condition clinicians should be aware of. Here, we illustrate a classic presentation of EIV with a few uncommon features.

Case Presentation

A previously healthy 51-year-old male presented with a painful, warm, spotted rash on his bilateral feet which intermittently flared after physical exertion, such as long walks or playing golf; the worst flare occurred after walking around Washington D.C. Interestingly, the patient could participate in hockey and triathlons without any skin issues. He had no systemic or intestinal symptoms during these episodes, and the skin was without pruritus or bullae formation. His prior treatments included triamcinolone 0.01% cream and ibuprofen, which helped shorten the duration and intensity of symptoms. The rash always resolved on its own after approximately five days. Cutaneous examination revealed scattered, deeply pink, non-blanchable macules, small patches, and thin papules across the dorsal aspect of his feet and extending onto the ankles bilaterally. A clinical diagnosis of EIV was made, and he was treated supportively.

Discussion

The stereotypical presentation of EIV is on the lower legs, sparing areas compressed by socks. A study of 23 patients diagnosed with EIV reported a female-predominance (22/23 patients) and only one patient with foot involvement (1). However, here we show that the sock cuff and feet can be involved. Certain terrains, lack of shoe support, length and type of physical activity can trigger symptom onset, and this is likely patient dependent, as illustrated by our patient case where participating in hockey and triathlons did not trigger a rash. Studies have shown that EIV

occurs after a certain threshold of activity is met, such as 18 holes of golf or 3 hours of activity (2). The diagnosis is clinical and laboratory investigation is typically normal. Symptoms resolve spontaneously within 10 days and cases can be treated supportively. A trial of compression stockings, light clothing, or corticosteroids may be considered, but have no proven benefit in symptom reduction (2). Other preventative measures include hydroxychloroquine, colchicine, or dapsone. We present this case of EIV to bring awareness to this interesting condition. Clinicians should consider EIV in any patient presenting with a skin eruption induced by physical activity, regardless of age, anatomic location, or type of physical trigger.

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Missouri Clinical Vignette Poster Finalist - Margaret Wieser

Title

Non-typhoidal Salmonella Mycotic Aortic Aneurysm after Pneumonitis and Bacteremia

Authors

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Introduction

Infectious aortitis is a rare clinical entity that is nearly always lethal without treatment. Prompt diagnosis and treatment with antibiotics and consideration of surgical intervention are critical as mortality remains high even with appropriate management [1]. However, the clinical presentation is often nonspecific with fever and thoracic, abdominal, or back pain being the most common symptoms [2]. This creates a diagnostic challenge that warrants workup with even low clinical suspicion. Mycotic aortic aneurysm (MAA), a term used to define aneurysmal changes due to infection, is a possible sequela.

Case Presentation

We report a case of an 89-year-old white male who presented to the emergency department (ED) two weeks after treatment for community-acquired bacterial pneumonia and salmonella typhimurium bacteremia with one week of oral ciprofloxacin. He finished his antibiotic regimen one week before the presentation but continued to have intermittent fevers, chills, fatigue, and a cough. In the ED, the patient was afebrile with hypertensive urgency and no leukocytosis. Computed tomography (CT) of the chest showed improving multilobar pneumonia and a new dissecting aneurysm in the descending thoracic aorta with an intramural hematoma in comparison to the one taken during prior hospitalization. He was transferred to our hospital for further care. Initial management involved strict blood pressure control. Due to recent bacteremia and concern for infectious aortitis, the patient was started on IV antibiotics based on previous salmonella sensitivities. Repeat blood cultures were negative. CT angiogram of the chest at our institution confirmed the above findings. After a discussion, our patient underwent thoracic endovascular aortic repair (TEVAR).

Discussion

Non-typhoidal Salmonella (NTS) bacteremia is an important cause of endovascular infections. Patients at increased risk include those over 50-years-old with persistent or high grade bacteremia, so early work-up and evaluation are essential. An endovascular infection can result in aortitis or mycotic aortic aneurysm with a high risk of rupture. Management of infectious aortitis is difficult due to a high rate of complications. Both conservative and surgical management have significant risks [3]. Growing evidence suggests that surgical intervention and antibiotic therapy have a more favorable outcome, especially with gram-negative aortitis [1, 4, 5]. However, due to the complex etiology and patient variability, management decisions are made on a case-by-case basis.

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Nebraska Clinical Vignette Poster Finalist - Michael Eller

Title

Double Trouble with Trimethoprim-Sulfamethoxazole

Authors

Michael Eller, BS; Evan Symons, DO; James Fagerland, MD; Trek Langenhan, MD

Introduction

Drug-induced immune thrombocytopenia purpura (ITP) and aseptic meningitis are rare and potentially life-threatening side effects of Trimethoprim-Sulfamethoxazole (TMP-SMX) use. This case demonstrates a unique occurrence of both of these rare adverse effects and highlights the importance of a medication reconciliation.

Case Presentation

A 27-year-old man presented to the emergency department with 3 days of headache, neck stiffness, night sweats, fever, and rash. He had a temperature of 39.2° and a petechial rash on the upper chest, extremities, conjunctiva, and oral mucosa. Meningitis was suspected and a lumbar puncture (LP) was planned. However, CBC revealed an isolated thrombocytopenia with a platelet count of 0. LP was canceled and blood cultures were drawn. He was admitted to intensive care and started on empiric treatment for meningitis with vancomycin, ceftriaxone, and dexamethasone. CT of the head and MRI of the thoracic/lumbar spine showed no abnormalities. Investigation of isolated thrombocytopenia included an LDH of 199 (98-192), haptoglobin 189 (36-215), fibrinogen 206 (160-450), and a peripheral smear without schistocytes. Autoimmune disease evaluation with ANA was negative. Infectious workup was also negative including tick-borne disease, babesia, West Nile, HIV, herpes viruses, and hepatitis viruses. Ten days prior to admission, the patient was prescribed a 2-week course of TMP-SMX for a suspected urinary tract infection. TMP-SMX was discontinued and the patient began treatment for immune thrombocytopenia purpura (ITP) and aseptic meningitis secondary to TMP-SMX. He received 1 unit of platelets, 2 doses of IVIG, and initiated on prednisone 70 mg daily for 2 weeks. Meningitis symptoms improved, fevers resolved, and platelet count slowly improved to 73 at discharge (4 days after presentation). Repeat platelet count at outpatient follow-up 9 days later was 367.

Discussion

While severe adverse reactions are relatively rare with commonly prescribed medications, this case highlights that the general internist must include adverse reactions on the differential and that a thorough medication reconciliation may lead to a diagnosis. TMP-SMX is a frequently used antibiotic that is useful in a variety of infections. The most common adverse effects are mild gastrointestinal (3%-8%) and dermatologic (3%-4%) reactions.1 However, there are well

documented associations between TMP-SMX and both ITP and aseptic meningitis.2-7 Systematic reviews found that TMP-SMX is the third most reported cause of drug-induced ITP and the most reported antibiotic cause of aseptic meningitis.2,5 This case is unique in that the patient appears to have had presented with both a drug-induced ITP and suspected aseptic meningitis, two rare, but serious complications of TMP-SMX. For the general internist, this case emphasizes the importance of maintaining a broad differential, which should include drug-induced adverse effects. Early identification and withdrawal of the offending agent can lead to a rapid recovery.

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Nevada Clinical Vignette Poster Finalist - Ashley Prandecki

Title

Cryptococcal meningoencephalitis in an HIV-negative host infected with COVID-19.

Authors

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Introduction

Cryptococcosis, a fungal infection caused by the yeast Cryptococcus neoformans, is a frequently encountered infection in immunocompromised hosts, including those with HIV infection, long-term corticosteroid use, solid organ transplants, and hematologic malignancies. It is typically acquired through inhalation of aerosolized particles, such as those found in soils contaminated with pigeon droppings. Common presentations include meningoencephalitis and pneumonia. Cryptococcal meningoencephalitis does rarely occur in patients with no apparent underlying diseases or risk factors, and these cases are associated with a poor prognosis due to subacute dementia and delayed diagnosis.

Case Presentation

A 52-year-old male with a medical history of uncontrolled diabetes and alcohol dependence presented to our hospital secondary to a fall and confusion. His initial physical examination revealed tachycardia and disorientation. Laboratory studies at the time demonstrated mild hyponatremia, ketonemia, mildly elevated transaminases, and hyperglycemia. Additionally, a COVID-19 PCR was positive. Radiographs obtained in the ED were unremarkable, but computed tomographic angiogram of the chest revealed ground-glass opacities in the left upper lobe. Thereafter, the patient was begun on Azithromycin and Ceftriaxone for treatment of possible community-acquired pneumonia. Due to his continued altered mentation and increasing lethargy, computed tomography of the head was obtained, revealing new areas of low attenuation in multiple periventricular and subcortical white matter areas, suggestive of infectious or inflammatory encephalitis. Thereafter, a lumbar puncture was performed, and cerebrospinal fluid (CSF) studies and microbiology were obtained. These studies revealed evidence of infection with Cryptococcus neoformans/gatti, hyperproteinorachia of 392, hypoglycorrhachia of 38, and mononuclear pleocytosis of 97. Prior to speciation of the patient's cultures, he was placed on empiric antibiotics and antiviral coverage for infectious meningoencephalitis. After discovery of the patient's infectious agent, his treatment regimen was narrowed to Amphotericin B and Flucytosine. Additionally, because of the patient's infectious strain, workup for HIV was initiated, with findings of decreased CD4 count in the absence of positive HIV serologies. As the

patient’s treatment for COVID-19 and Cryptococcosis progressed, his CD4 count later spontaneously corrected.

Discussion

This case is significant because it demonstrates a case of Cryptococcal meningoencephalitis in a patient with transient lymphocytopenia and active COVID-19 infection. According to a meta-analysis by Zhang & Wu (2020), there is a significant correlation between COVID-19 infection and low CD4 and CD8 counts. Therefore, in this particular case, it is possible that infection with COVID-19 in combination with increased infection risk from inadequately managed diabetes and daily alcohol use predisposed the patient to transient lymphopenia, leading to Cryptococcosis. Ultimately, it is imperative that physicians be aware of any etiology that may predispose patients to infections with uncommon microbes, particularly in the absence of typical predisposing factors.

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New Jersey Clinical Vignette Poster Finalist - Jiakai Ji

Title

Hypertriglyceridemia in intubated patients with COVID-19: a case-series highlighting associations with tocilizumab and propofol therapy

Authors

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Introduction

Many studies have established the profound inflammatory cytokine storm associated with progression of COVID-19 in critically ill patients. Currently tocilizumab (TCZ), a recombinant monoclonal interleukin-6 (IL-6) receptor antibody, is being explored as a treatment for COVID-19 by interfering with IL-6's role in initiating cytokine storms.[1, 6] Chronic use of TCZ has been shown to increase lipid parameters, most notably triglycerides (TAG), by interfering with their uptake by skeletal muscles.[2, 3] Propofol used for sedation of intensive care unit (ICU) intubated patients can also disturb lipid metabolism and causes hypertriglyceridemia, a manifestation termed propofol infusion syndrome (PrIS) comprising of hyperlipidemia, acidemia, liver, kidney and cardiac injury.[4, 5] Risk factors for PrIS include infusion of >48 hours, high doses >67 mcg/kg/min, critical illness, carbohydrate depletion, and concurrent administration of vasopressors and corticosteroids.[4] Patients with severe COVID-19 infection may be at higher risk of developing hypertriglyceridemia and organ damage due to the compounded effects of TCZ and prolonged high-dose propofol use, in an already pro-inflammatory critically ill state.

Case Presentation

In this series, 3 cases of hypertriglyceridemia are described in critically-ill intubated patients with COVID-19 treated with TCZ and propofol. Hospital stay ranged from 13 to 26 days, with intubation duration ranging from 6 to 26 days. Propofol was used as a sedative in all 3 patients, but due to concern for PrIS, was discontinued in 1 patient on day 20, resulting in a subsequent decrease in triglycerides. All three patients received TCZ and reached peak triglyceride levels ranging from 935 to 1277 mg/dL (ref. <150 mg/dL) 4 to 8 days later, with none having prior history of hyperlipidemia. Patients all exhibited elevated IL-6 with peak values ranging from 345 to 1790 pg/mL (ref. 0-15.5 pg/mL), as well as elevated CRP, LDH and D-dimers levels. Of note, liver transaminases also became acutely and maximally elevated within 48 hours of death in all 3 patients, with aspartate aminotransferase (AST) ranging from 991 to 3371 U/L and alanine aminotransferase (ALT) of 673 to1599 U/L.

Discussion

Propofol increases TAG levels due to its lipid emulsion solvent[3] and impairment of mitochondrial beta-oxidation of fatty acids in the liver.[8] IL-6 also has metabolic actions on lipolysis, and TCZ use has been associated with hypertriglyceridemia due to attenuated lipolysis of TAG and reduced hepatic clearance of TAG-rich lipoprotein.[7] All 3 patients received propofol dosages between 5 to 60 mcg/kg/min, however, infusion durations ranged from 6 to 21 days with 2 patients also receiving vasopressors, increasing their risk of PrIS. PrIS may also contribute to elevated liver enzymes and steatosis[4] and ischemic liver injury manifesting in high aminotransferase levels is also a concern in COVID-19 due to possible lung failure and shock induced hypoxia.[9] Patients receiving both tocilizumab and propofol may be more prone to developing hypertriglyceridemia due to PrIS, metabolic activity of IL-6 inhibitors and COVID 19's cytokine storm. These patients require vigilant monitoring of metabolic parameters to avoid adverse effects and increased risks for complications from hypertriglyceridemia that may impact liver and pancreatic function, as well as overall survival.

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New Mexico Clinical Vignette Poster Finalist - Michelle Thomas

Title

Psychosis and seizures caused by a virus and a tumor- NMDA receptor encephalitis with VZV and a teratoma

Authors

Michelle Thomas, BS; Alexandra Haigh, BS; Tarun Girotra, MD; Elizabeth Macri, MD

Introduction

Anti-N-methyl-D-aspartate receptor encephalitis (NMDA-RE) is a rare autoimmune encephalitis, which classically has been associated with ovarian teratoma but rarely with concomitant viral encephalitis. We present the first reported case of NMDA-RE with a dual trigger of ovarian teratoma and Varicella Zoster Virus (VZV) encephalitis.

Case Presentation

A previously healthy 33-year-old female was referred to our medical center after developing subacute auditory and visual hallucinations, generalized seizures, and progressive encephalopathy. Hospital course was complicated by progressive worsening of her encephalopathy, agitation, and frank psychosis. MRI brain revealed T2/FLAIR hyperintensity of mesial temporal regions without pathological enhancement. Electroencephalogram (EEG) showed bi-temporal epileptiform discharges corresponding to MRI abnormalities. Cerebrospinal fluid (CSF) evaluation showed lymphocytic pleocytosis (31 total WBC; 92% lymphocytes), elevated protein (74 mg/dL), positive VZV PCR, and positive NMDA. Further work up also revealed a 4.1 cm right ovarian cystic teratoma for which she underwent right salpingo-oophorectomy during hospital stay. She was treated with a 10-day course of IV acyclovir followed by 5-days of intravenous immunoglobulin (IVIG). Her seizures were controlled with carbamazepine. Her neuropsychiatric symptoms significantly improved by her second month follow up visit with short-term amnesia and fatigue being the most prominent symptoms. Follow up CSF evaluation revealed negative VZV PCR and NMDA.

Discussion

Our case signifies the importance of thorough investigation for autoimmune encephalitis, which typically affects young patients without previous neuropsychiatric conditions. While ovarian teratoma is the most commonly associated pathology with NMDA-RE, recent literature has suggested viral encephalitis as a trigger for patients to develop NMDA-RE. Our case is unique because she had both active VZV encephalitis and an ovarian teratoma as potential triggers for NMDA-RE. While HSV and VZV have been associated with NMDA-RE, to the best of our

knowledge, ours is the first case with concomitant VZV encephalitis, teratoma and NMDA-RE. Successful treatment of viral encephalitis such as HSV and VZV can be achieved with acyclovir whereas immunomodulating therapy with IVIG, plasmapheresis, and corticosteroids and teratoma removal as applicable, are commonly used therapies for NMDA-RE. The case emphasizes the importance of evaluating for all treatable causes of encephalitis as appropriate therapy can significantly influence the outcome of patients such as ours.

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New York Clinical Vignette Poster Finalist - Peter Bhandari

Title

POLYARTICULAR GOUT MIMICKING RHEUMATOID ARTHRITIS: A CASE REPORT

Authors

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Introduction

For a patient presenting with peripheral polyarticular symmetrical arthritis, elevated inflammatory markers and a positive rheumatoid factor (RF), the usual primary differential diagnosis is rheumatoid arthritis (RA). However, there are unusual presentations of acute symmetrical polyarticular gout that may mimic RA.

Case Presentation

A 49-year-old male from Ghana with a medical history significant for hypertension, hyperlipidemia, and type 2 diabetes mellitus presented to the emergency room after a single episode of coffee ground emesis associated with epigastric pain for the past 3 days. Patient endorsed consuming 2-3 pints of vodka every weekend for the past 20 years. He was admitted for suspected upper gastrointestinal bleeding. An urgent endoscopy was performed and a non-bleeding ulcer in the gastric fundus was clipped. Patient received two packed red blood cells transfusions and his vitals stabilized.

One day after admission, he complained of multiple joint pain and swelling. Upon evaluation, the patient was found to be febrile and tachycardic with bilateral knee swelling and tenderness. All metacarpophalangeal joints (MCP) and proximal interphalangeal joints (PIP) joints were tender to palpation and swelling of the 2nd and 3rd PIP was noted in both hands. Plain radiographs of his hands demonstrated periarticular erosive changes and joint space narrowing. Serology revealed positive RF at 18.1 IU/mL (reference range, <14 IU/mL is normal) and negative anti-cyclic citrullinated peptide (anti-CCP) at 16 IU/mL (reference range, <20 IU/mL is normal). Serum uric acid levels were low at 4.2 mg/dL. Arthrocentesis of the left knee was performed and 40 mL of opaque, viscous synovial fluid was aspirated. Synovial fluid analysis revealed an inflammatory effusion (WBC 20,400 cells/mm^3) with abundant monosodium urate crystals. Patient was started on colchicine 0.6 mg twice a day with symptomatic relief and followed with Rheumatology outpatient.

Discussion

Polyarticular gout is seen in less than 20 percent of patients and later in the disease course. One study reported 41 patients over 3 years who presented with acute polyarticular gout that was initially masked by a different diagnosis.

According to the American College of Rheumatology (ACR) guidelines, our patient presented with clinical and radiological findings suggestive of RA. However, he also had evidence of gouty arthritis with monosodium urate crystals in synovial fluid. While there are few case reports of RA and gout overlap, in general, the definition of RA relies on seropositivity of RF or anti-CCP. Although RF was positive, anti-CCP was negative. Additionally, the location and shape of the erosion might support RA or gout. As per the ACR guidelines, low serum uric acid does not exclude the diagnosis of gout. In this case, we argue for the initiation of standard therapy for gout with colchicine prophylaxis and allopurinol. A consideration for RA therapy should be revisited if the patient continues to have persistent arthritis despite adequate treatment for gout.

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North Dakota Clinical Vignette Poster Finalist - Anna Reinholz

Title

Reactive Arthritis: An Unusual Presentation of Acute Clostridioides difficile Colitis

Authors

1 Anna Reinholz, MS3 2 Devendranath Mannuru, MD 3 Abhishek Matta, MD University of North Dakota School of Medicine and Health Sciences and Fargo Sanford Health

Introduction

Reactive arthritis is a rare presentation of acute Clostridioides difficile colitis and requires high level of clinical suspicion to definitively diagnose. It is classically seen with the organisms Salmonella, Shigella, Campylobacter, Chlamydia, and Yersinia, with Clostridioides difficile cases cited roughly 50 times in the literature thus far. Additionally, overlapping symptoms with inflammatory bowel disease associated arthropathy can make this diagnosis particularly difficult to make. Both reactive arthritis and inflammatory bowel disease related arthropathy have associations with HLA B27.

Case Presentation

A 20-year old Caucasian male with a history of psoriasis presented to the emergency department due to severe polyarthralgia of the elbows, wrists, and ankles that began 2 weeks after the onset of non-bloody diarrhea. The initial workup two days prior in an urgent care clinic returned negative for all enteric pathogens including C. difficile nucleic acid amplification test, tick borne illnesses, West Nile, and a normal rheumatoid factor, among others. Computerized tomography (CT) demonstrated nodular thickening involving the cecum and ascending colon with adjacent inflammation. Colonoscopy revealed pseudomembranous colitis with a positive C. difficile toxin aspirate. Tissue biopsy of the terminal ileum and colon was then conducted to differentiate between C. difficile colitis reactive arthritis and inflammatory bowel disease with extraintestinal manifestation. The result of the biopsy showing colitis without evidence of inflammatory bowel disease, in addition to the C. difficile positive aspirate and polyarthralgia led to the diagnosis of reactive arthritis. The patient improved upon treatment with naproxen and was referred to rheumatology where he was found to be HLA B27 positive.

Discussion

Reactive arthritis is classically associated with Salmonella, Shigella, Campylobacter, Chlamydia, and Yersinia, with cases of enteric organisms such as Clostridioides difficile cited uncommonly in the literature. C. difficile is a known causal agent of relapse in inflammatory bowel disease, making it difficult to delineate between true reactive arthritis and inflammatory bowel disease with extraintestinal manifestation. In this case, the clinical diagnosis was made based on criteria including 1) asymmetric oligoarthritis, 2) enteritis preceding the onset of arthritis, and 3)

presence of triggering infection evidenced by culture positivity. C. difficile colitis cases continue to rise with widespread antibiotic use, hospital acquired infection, and community acquired infection without prior antibiotic use. The greatest take-away is that clinicians should suspect reactive arthritis when a patient presents with severe polyarthralgia developing within 1-4 weeks of preceding enteric or genitourinary infection, and that C. difficile as an etiologic agent, although uncommon, has been documented in the literature.

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Oregon Clinical Vignette Poster Finalist - Ayesha Khader

Title

Another Doxy-Deficient State

Authors

Ayesha Khader, BS; Rachel Westwood, MD; Jina Makadia, MD

Introduction

In the 1930s there were thought to be two spotted fever rickettsioses in southern Africa, one caused by Rickettsia conorii and the other unknown. Pijper was able to isolate the cause of the unknown rickettsial disease, however the isolate was lost. The idea of two rickettsioses fell out of favor and tick-bite fever became one entity[1,2]. In 1992 a patient presented in Zimbabwe, and PCR identified the isolate that Pijper had lost, confirming the presence of two pathogenic rickettsioses: *Rickettsia conorii*, the cause of Mediterranean spotted fever, and *Rickettsia africae*, the cause of African tick bite fever (ATBF)[2]. ATBF is an acute febrile illness transmitted by Amblyomma genus ticks (variegatum and habraeum) endemic to Sub-Saharan Africa and the eastern Caribbean[1].

Case Presentation

A 63-year-old male presented with three days of worsening left foot pain, redness and swelling, and two days of fevers, chills, night sweats, and nausea. He had returned the day prior from southern Africa. He had an erythematous, violaceous, and exquisitely tender left first metatarsal, with significant left lower extremity (LLE) edema. Laboratories were normal with a slightly elevated C-reactive protein (CRP) of 8.8. Plain films and venous ultrasound were unremarkable, and he was admitted for cellulitis and intravenous (IV) antibiotics. The erythema, swelling, and tenderness progressed and there was concern for arterio-embolic phenomena. So, he was anti-coagulated, transferred and admitted to the vascular surgery service at OHSU. There he was started on cefazolin and a heparin drip, and underwent extensive workup including a chest computed tomography (CT) angiography, transthoracic echocardiogram, LLE arterial duplex, pelvis CT angiography with run-off, and LLE CT, all of which were unremarkable. The erythematous and bullous rash continued to spread proximally. On day three of admission the CRP was 114 and therapy was broadened to IV Vancomycin, Zosyn, and Clindamycin. Blood, wound, and tissue cultures continued to show no growth. On day five doxycycline was started, and repeat CRP was 85. CRP downtrended to 40 and then 28 by day eight. Broad range PCR came back weeks later positive for *Rickettsia africae.*

Discussion

A number of zoonotic and atypical infections must be considered in the returning traveler with febrile illness and rash, such as malaria, trypanosomiasis, dengue, schistosomiasis, and

Mediterranean spotted fever[1,2]. Estimates are that 13.7% of healthcare-seeking travelers returning from southern Africa have a diagnosis of spotted fever group rickettsia, with more than 99% of those caused by *Rickettsia africae* which results in ATBF[4]. Most patients will have single or multiple inoculation eschars[1,3], accompanied by headaches, myalgias, and regional lymphadenopathy[1]. Less common symptoms include a maculopapular or vesicular rash, subacute or chronic neuropathy, myocarditis, and aphthous stomatitis[3]. Elevated CRP, moderate lymphopenia, transaminitis, and thrombocytopenia are also associated with *Rickettsia africae*[4]. Diagnosis is best confirmed by PCR of an eschar biopsy, and treatment is doxycycline 100 mg twice daily for seven to ten days[1]. Clinicians should consider rickettsia in skin and soft tissue infections that do not respond to empiric therapy, especially in the returning traveler.

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Tennessee Clinical Vignette Poster Finalist - Irtiqa Fazili

Title

A case of COVID-induced SIADH

Authors

Irtiqa Fazili, Samantha Whitwell, David Wilbanks

Introduction

COVID-19 has a wide range of presentations, with emerging reports of atypical signs and symptoms. Here, we report a case of COVID-19 which presented with fever and hyponatremia caused by SIADH.

Case Presentation

A 76-year-old African-American female with a history of diabetes, hypertension, and hyperlipidemia presented to the ED with 4 days of sharp 10/10 abdominal pain localized to the left lower quadrant. The pain did not radiate and was not associated with food or defecation. She endorsed diarrhea and denied nausea, vomiting, or constipation. On presentation, the patient was febrile to 38.3, blood pressure 114/64, heart rate 101, respiratory rate 22. She was initially saturating at 86% on room air, which increased to 93% on 4L nasal cannula. CT chest/abdomen/pelvis showed patchy subpleural ground-glass opacities. Labs were notable for sodium of 124, ferritin of 684.4, procalcitonin 0.19, and creatinine of 2.64. The patient was admitted to the COVID unit and confirmed to be COVID positive. She continued to have increased work of breathing and respiratory distress on high flow nasal cannula with FiO2 50%, so she was escalated to Vapotherm and admitted to the ICU. There, she was treated with Remdesivir, convalescent plasma and steroids. When she was stabilized and transferred to the floor after two weeks, her persistent hyponatremia (Na 124-131) did not improve with normal saline and continued to worsen to 119. Of note, the patient had no prior diagnosis of kidney disease or hyponatremia and was not on any medications causing hyponatremia. On admission, the patient's urine osmolality was 372, which increased to 472 and then to 619 over the course of her admission, with urine sodium fluctuating between 41 and 75. The patient was fluid restricted and rapidly corrected with 3% sodium chloride. Her sodium improved to 130 and she was discharged on fluid restriction and salt tabs with close PCP follow-up.

Discussion

This patient has acute hyponatremia with highly concentrated urine and serum sodium about 40; thyroid and adrenal function are normal. She meets criteria for SIADH. Common causes of SIADH include malignancy, pulmonary conditions, central nervous system disorders, and medications. These etiologies were excluded in our patient. More recently, as of June 2020, there have been several case reports of COVID-19 pneumonia-associated excess of vasopressin

secretion. As in the case we present here, these cases have presented with fever, hyponatremia, and evidence of atypical COVID pneumonia on CT scan [1]. One possible mechanism of COVID-induced SIADH is a sequela of hypoxia-induced pulmonary vasoconstriction, which reduces left atrial filling, and induces baroreceptors to stimulate release of ADH [2]. COVID-19 presentation varies widely, from asymptomatic to severe respiratory failure. Common symptoms include fever (88.5% of cases), cough (68.6%), myalgia (35.8%), and dyspnea (21.9%). Less commonly, patients present with headache (12.1%), diarrhea (4.8%), and nausea/vomiting (3.9%) [3]. Hyponatremia and electrolyte imbalances should be included in future meta-analyses to determine the rates at which COVID infections present with these signs. In the interim, clinicians should keep COVID-19 on their differentials when a patient presents with fever and hyponatremia.

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Texas Clinical Vignette Poster Finalist - Kaylee M Oconnor

Title

Keeping a Pulse on the Physical Exam

Authors

Kaylee O'Connor, BS; Safee-Hana Belbina, BS; Julie Machen, MD

Introduction

Takayasu Arteritis is a rare disorder characterized by segmental granulomatous vasculitis of the aortic arch and its major branches. Diagnosing Takayasu's is essential due to the serious associated morbidity, including stroke, aortic aneurysm, renal artery stenosis, and limb ischemia. A thoughtful, focused physical exam is essential to making the correct diagnosis, particularly when patients present with nonspecific symptoms.

Case Presentation

A 37-year-old Hispanic woman presented with three days of intermittent shortness of breath worsened by anxiety and dull pain on the right side of the neck. She also endorsed fatigue and a 13lb weight loss in the last month. She had no chest pain, palpitations, cough, or fever. Medical history was significant for hypertension, type II diabetes, and a stroke 4 weeks ago which occurred in Mexico. Upon presentation, vital signs were stable with a blood pressure of 121/73. However, after admission to the hospital blood pressure in the left leg was 156/104 and in the right leg 174/105. The patient was well-appearing and in no distress. Cardiac auscultation revealed regular rate and rhythm with no murmurs. A bruit was heard over the right carotid artery and there were diminished sounds over the left carotid artery. The right carotid artery was tender to palpation. Brachial, radial, and dorsalis pedis pulses were diminished on the right compared to the left side. No aortic bruit was heard. Neurologic exam revealed an expressive aphasia. Pulmonary, abdominal, and skin examination were normal. Laboratory studies included a normal CBC and CMP, ESR 9, CRP 0.3, d-dimer 354, HbCA1c 8.1, normal coagulation studies, and negative infectious workup including blood cultures. Hypercoagulable workup and protein electrophoresis were normal. A robust autoimmune panel was negative except for an ANA titer of 1:160. Imaging studies included a normal chest x-ray and a CT angiogram showing diffuse circumferential thickening of both carotid arteries causing 80-90% occlusion and no evidence of pulmonary embolism. The patient met diagnostic criteria for Takayasu Arteritis and was admitted for management with high dose oral steroids and for a stroke workup with the neurology team. She was discharged after three days with follow-up with a primary care physician, neurology, and rheumatology.

Discussion

In this case, a young woman presented with shortness of breath, fatigue, weight loss, neck pain and hypertension, and was diagnosed with Takayasu Arteritis. Her presentation highlights the importance of considering secondary causes of hypertension, particularly in young healthy patients. Furthermore, it emphasizes the importance of the physical exam in diagnosing secondary causes of hypertension. By discovering the patient's carotid bruit, unilateral diminished pulses, and discrepancy in blood pressure between lower limbs, the admitting team was able to quickly order appropriate imaging, ensuring optimal treatment for a woman with new Takayasu Arteritis.

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Vermont Clinical Vignette Poster Finalist - Richard Brach

Title

Encephalopathy of Unexpected Origin

Authors

Richard Brach

Introduction

While the pathophysiology is still unclear, Hashimoto's encephalopathy is characterized as a steroid-responsive autoimmune encephalopathy associated with thyroid antibodies. Hashimoto's encephalopathy has a broad and complex differential diagnosis that includes both primary neurologic and systemic causes, making it a difficult diagnosis to reach. This is further complicated by the fact that many patients have thyroid stimulating hormone (TSH) within normal limits and no prior history of Hashimoto's thyroiditis. Some authors have proposed that the thyroid antibodies are not pathogenic with the thought that since autoimmune disorders tend to occur in association with one another, the thyroid antibodies may be a marker of autoimmune disturbance affecting the brain.

Case Presentation

A 76 year old man with a history significant for alcohol use disorder and mild cognitive impairment presented to the ED after being found in a state of confusion lying on the ground of his apartment in urine and feces. Of note, he was admitted to the hospital with a similar presentation one month prior and discharged with a diagnosis of chronic cognitive decline. On exam, his temperature was 38.6 degrees C, HR 72, BP 93/58, RR 26, SpO2 94%. He opened his eyes to voice but did not respond to questions. Head was atraumatic and neck flexion was without discomfort. Cardiovascular, pulmonary, and abdominal exam significant only for tachypnea. Neuro exam found no gross motor deficits. Initial laboratory workup was notable for a lactate of 5, WBC 15.72, CK 282. LP found an elevated protein (90 mg/dL). Imaging showed no acute abnormalities. He was admitted for a workup of acute encephalopathy of unknown origin with Keppra as seizure prophylaxis. Neurology was consulted. The initial differential included seizure disorder, alcohol withdrawal, infectious encephalitis, and autoimmune encephalitis. His daughter said that his first episode of confusion was one year ago. Since then, the patient has had seven out-of-state hospitalizations for acute encephalopathy. After each episode, his cognition would return, but not quite to his baseline. Further studies showed anti-thyroperoxidase antibody elevated at 633 U/mL. His TSH was within normal limits at 3.35, stable from his prior hospitalization. His elevated anti-TPO antibody was consistent with Hashimoto's encephalopathy and the medical team started him on methylprednisolone for three days, followed by a prednisone taper. Post-discharge follow up and repeat anti-TPO levels were scheduled with neurology.

Discussion

Hashimoto's encephalopathy is commonly misdiagnosed as viral encephalitis, stroke, and Alzheimer disease. This is consistent with this patient's hospitalization one month prior which was attributed to chronic cognitive decline. A detailed history from the daughter was not documented previously. Her knowledge of seven prior out-of-state hospitalizations over just the past year was essential for identifying this as a new, subacute problem. While Hashimoto's encephalopathy is a rare culprit of encephalopathy, it is important to consider because it is treatable. Up to 98% have favorable responses to corticosteroids, many of whom return to baseline neurologic status. Ultimately, approaching encephalopathy with a broad differential focusing on a detailed history will help lead to earlier diagnosis and fewer hospitalizations of patients with Hashimoto's encephalopathy.

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Virginia Clinical Vignette Poster Finalist - Asheema Pruthi

Title

First Bite Syndrome After Parapharyngeal Surgery

Authors

Asheema Pruthi - OU Tulsa School of Community Medicine Chris Siemens, MD - Eastern Oklahoma Ear, Nose & Throat Paul Kempe, MD - Warren Clinic Cardiothoracic & Vascular Surgery

Introduction

Most schwannomas, other than those associated with neurofibromatosis, occur in the para-pharyngeal space often originating from Cranial nerves (CN) 9-12 or the sympathetic chain. Although cervical sympathetic chain (CSC) schwannomas are uncommon, they are known for their ability to mimic the physical and radiologic findings of carotid body tumors. Treatment is surgical resection. Post-operative complications involved with removing the CSC include Horner's syndrome (almost inevitable) and First Bite Syndrome.

Case Presentation

An 80-year-old female presented with a 7-year history of an enlarging right neck mass followed serially over time with moderate growth. The patient complained of locally compressive symptoms including bilateral neck pain, dizziness, dysphagia and hoarseness. The mass was non-tender and firm with a 4-5 cm diameter oriented vertically. Flexible fiber-optic laryngoscopy revealed R vocal cord (VC) sluggishness with poor abduction. CT demonstrated the mass as measuring 3.6 x 3.5 x 4.9 cm with close adherence to the right carotid artery. Biopsy was non-diagnostic. The patient consented to mass excision and right neck dissection that was performed by an otolaryngologist and cardiovascular surgeon. The right-sided mass was free from the jugular vein, carotid artery, and CN 10. It measured 5.7 cm in the largest dimension and was attached to a nerve bundle, possibly the CSC. Histopathologic examination revealed the mass to be likely consistent with a schwannoma. On post-operative day #1, the patient had normal tongue mobility, intact CN 7 function, slight ptosis of the right eye and symmetric pupils without miosis. Fiber-optic laryngoscopy revealed subtle right VC weakness that improved by post-operative day #5. Approximately one month later, the patient complained of discomfort in her mouth and jaw on initiating a meal. Following right parotid gland ultrasound examination, the patient was diagnosed with First Bite Syndrome. Botulinum toxin was injected within the parotid gland for symptom management.

Discussion

In First Bite Syndrome, pain in the parotid area can be severe with the first bite of food. With subsequent bites, the pain often decreases. It is currently thought this is likely due to sympathetic

denervation of the parotid gland due to severing of the CSC resulting in hypersensitivity of the sympathetic receptors. A majority of these symptoms resolve over time. There is evidence that Botulinum toxin type A injection causes improvement of symptoms by inducing parasympathetic nerve paralysis of the parotid gland. This can also minimize salivation by reducing the hyper-stimulation and exaggerated myoepithelial cell contraction.

West Virginia Clinical Vignette Poster Finalist - Abby T Rosiello

Title

Atrioventricular Heart Block Secondary to Lyme Carditis in a 21-Year-Old Male

Authors

Abby Rosiello, MS2 and Dr. Mike Campsey, MD

Introduction

Lyme disease (LD) has become the most prevalent vector-borne disease in the US. The causative agent is Borrelia burgdorferi, a Gram-negative spirochete that promotes systemic infection after gaining access to the bloodstream via an Ixodes scapularis tick bite. This microorganism exhibits a marked tropism for the heart, where it invades the cardiac tissue and initiates inflammation to cause a condition known as Lyme carditis (LC). This is a rare clinical presentation of LD, occurring in less than 1% of patients. The most significant clinical sign of LC is high-degree atrioventricular heart block (AVB) due to the propensity of the organism to infect the base of the heart and interfere with functioning of the AV node. Notably, the degree of AVB is transient and can vary over minutes to hours to days. These cardiac sequelae typically present 2 to 5 weeks after initial infection.

Case Presentation

In this case report, we present a 21-year-old male diagnosed with third-degree AVB secondary to LC. The patient initially presented with inflating left-sided chest pain, near-syncopal episodes, shortness of breath, and dizziness occurring intermittently over a 2-week period. An EKG illustrated sinus tachycardia and third-degree AVB with an accelerated junctional rhythm. Endocarditis was suspected and he was started empirically on vancomycin and aztreonam, however he was quickly switched to doxycycline for concern of LC. He had no known history of tick bites but admitted to significant exposure to the outdoors. Later, positive IgM serology confirmed the diagnosis. Typical signs and symptoms of LD such as erythema migrans (‘bullseye rash’), fatigue/malaise, and fever exhibit a markedly lower frequency in LC. In our patient, his symptoms occurred in the absence of any classical findings of LD, which can make this a difficult diagnosis without a previous clinical suspicion.

Discussion

Considering the severity and symptomatic nature of his complete AVB, a dual lead permanent pacemaker was inserted before LD was confirmed. The patient was initially 95% paced but was 0% paced 2 months later, and pacemaker removal was performed 4 months after insertion. First-line treatment for LC include empiric administration of intravenous ceftriaxone and/or oral doxycycline, both highly effective for this infection. Recovery of normal heart rhythm commonly occurs in a stepwise progression within 1-2 weeks of antibiotic administration.

Therefore, permanent pacemaker implantation is not usually indicated for LC heart block, an important distinction from the standard treatment of pacing provided to patients with AVB due to other conditions. Overall, when evaluating patients with acute onset of AVB, LC is an important differential to consider, even in the absence of other clinical signs of LD. Timely diagnosis allows for early and effective treatment of this frequently transient condition and may prevent implantation of a permanent pacemaker.

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CHAPTER WINNERS – RESEARCH PAPERS

California Research Poster Finalist - Dayna Isaacs

Title

Outpatient Management of Adults Diagnosed with Acute Pulmonary Embolism in Primary Care: An Interim Analysis of a Retrospective Cohort Study

Authors

Isaacs DJ, Johnson EJ, Hofmann ER, Rangarajan S, Huang J, Shan J, Wallace KL, Reed ME, Mark DG, Vinson DR

Introduction

Select ambulatory adults with acute pulmonary embolism (PE) can be safely managed as outpatients, as demonstrated by studies in emergency departments (EDs) and specialty clinics. Little has been published, however, on outpatient management in the primary care setting. We sought to describe the characteristics, management, and outcomes of primary care adults diagnosed with acute PE. We hypothesized that patients managed comprehensively by primary care physicians (clinic only) would demonstrate no significant difference in short-term health outcomes when compared with patients who were referred to the ED and subsequently discharged home (clinic-plus-ED).

Methods

This retrospective cohort study included adults diagnosed with acute PE by primary care physicians across 60 community-based facilities in a northern California integrated health care system during 2018-2019. No pathways were in place to guide ED referral. We excluded patients already on anticoagulation and those receiving comfort-focused care. We combined electronic health record extraction with structured manual chart review. Chi-squared and Wilcoxon test analyses were used to compare clinic-only with clinic-plus-ED patients. Variables included demographics, history of venous thromboembolism (VTE), PE Severity Index, proximal clot location, specialty consultation, and 7-day follow-up. The primary outcome was 7-day PE-related hospitalization; secondary outcomes were 30-day adverse events, including recurrent VTE, major hemorrhage, and all-cause mortality.

Results

Among 208 adults, we excluded 18 who were already anticoagulated and 1 receiving comfort-focused care. Of 189 study-eligible patients, 69 (37%) were hospitalized and 120 (63%) were managed as outpatients: 36 in the clinic-only (30% of outpatients) and 84 in the clinic-plus-ED (70% of outpatients) group. Among outpatients, median age was 64 y (IQR 50-73), 60% were male and 65% were non-Hispanic white. Overall, their PE Severity Index Class was

predominantly lower risk (93% were Classes I-III), 31% of those who underwent computed tomography pulmonary angiography (n=115) had a proximal clot, 46% received specialty consultation prior to home care, and 81% were treated with a direct oral anticoagulant. Seven-day follow-up was common: 67% with physicians and 90% with pharmacists for telephone-based anticoagulation care. The two outpatient groups were similar in demographics and the above clinical characteristics, except proximal clot: 14% in the clinic-only vs 38% in the clinic-plus-ED gro up (P

Conclusion

Almost two-thirds of adults diagnosed with acute PE in primary care were managed without hospitalization. Approximately one-third of these were treated without ED referral. The clinic-only patients were similar to those discharged home after brief ED evaluation, except more patients with proximal clot were referred to the ED. Adverse events were rare in both outpatient groups. Outpatient management of select primary-care PE patients appears to be safe and effective in this setting with and without ED referral.

California Research Poster Finalist - Amanda Nguyen

Title

Presence and Severity of Pulmonary Arteriovenous Malformations in Fontan Patients

Authors

Amanda Nguyen, David Geffen School of Medicine, UCLA Jeannette Lin, MD, Department of Medicine Cardiology, UCLA

Introduction

The Fontan procedure is a palliative surgery performed in patients with congenital heart defects that results in a single ventricle circulation. Although variants of the Fontan procedure can be performed, each technique involves anastomoses between the caval veins and the pulmonary arteries to passively direct deoxygenated venous blood to the lungs. Over time, changes in systemic venous and pulmonary pressures can cause pulmonary arteriovenous malformations (PAVM) to form [2,4]. Differential flow distribution and hepatic factor produced in the liver may be protective against PAVM [5]. Agitated saline contrast studies (ASCS) can be performed to explore if the type of Fontan or duration of time since surgery influences PAVM development [1,3].

Methods

Retrospectively, 47 adult Fontan patients who underwent simultaneous cardiac catheterization and saline contrast transesophageal echocardiogram at UCLA since January 1st, 2016 were identified. The ASCS for these patients were reviewed for presence and severity of PAVM. The ASCS were graded as follows: 0 (no bubbles seen); 1+ (1-20 bubbles); 2+ (>20 bubbles without chamber opacification); 3+ (bubbles resulting in chamber opacification). Patient history, cardiac anatomy, years since Fontan surgery, and type of Fontan were considered.

Results

Of the 47 patients, 8% had a RA-PA Fontan, 47% had a lateral tunnel Fontan, and 45% had an extracardiac Fontan. Of RA-PA Fontans, 25% had equal ASCS grades in the RPA and LPA; 25% had a 1 grade difference; and 50% had a 2 grade difference. Of lateral tunnel Fontans, 50% had equal ASCS grades in the RPA and LPA; and 50% had a 1 grade difference. Of extracardiac Fontans, 57% had equal ASCS grades in the RPA and LPA; 24% had a 1 grade difference; and 19% had a 2 grade difference. Three patients had bilateral bidirectional Glenn shunts, and all three patients had a higher grade bubble study on the side opposite of the Fontan. 2% of patients had a Fontan circulation for 0-10 years with an average ASCS grade of 1.50; 30% of patients 11-20 years after Fontan had an average ASCS grade of 1.60; 49% of patients 21-30

years after Fontan had an average ASCS grade of 1.20; 19% of patients 30-40 years after Fontan had an average ASCS grade of 0.96.

Conclusion

We found that patients with lateral tunnel Fontans were more likely to have similar PAVM burdens between the LPA and RPA. Patients with RA-PA and Extracardiac Fontans were more likely to have considerably different PAVM burdens between the LPA and RPA. However, the duration of time since the original Fontan surgery did not correlate with differential PAVM burden, and actually had a trend towards decreased PAVM burden. Presence of bilateral bidirectional Glenns correlated with higher PAVM burden in the lung contralateral to the Fontan, suggesting less protective hepatic factor in this lung due to flow dynamics. Confounding factors, such as amount of exercise, other collaterals, or degree of hepatic fibrosis may have influenced PAVM development. Further elucidation on venous return is needed to draw conclusions about whether differential blood flow in the Fontan variants truly influences PAVM development.

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Florida Research Poster Finalist - Sonam Parag

Title

COVID-19 Pathogen (SARS-CoV-2) Viral Evolution Leading to Increased Infectivity

Authors

Sonam Parag, MS-II, Nova Southeastern University Dr. Kiran C. Patel College of Allopathic Medicine; Kate Carnevale, Ph.D., Nova Southeastern University Dr. Kiran C. Patel College of Allopathic Medicine

Introduction

Human coronaviruses were first identified in the mid-1960s by D.A.J Tyrrell and were not considered to be highly pathogenic until the outbreak of Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-1) in 2003. The SARS virus was first isolated in Guangdong, China after transmission to humans from an animal host, and quickly spread around the world. This virus rapidly disappeared, despite having a replication rate (R0) of ~2. A related virus, Middle East Respiratory Syndrome Coronavirus (MERS-CoV), emerged in Saudi Arabia in 2012 and assumed to originate from camels. While MERS was more lethal than SARS, it was less transmissible, making it self-limiting with a R0

Methods

Amino acid sequences of the spike protein of each virus (SARS-CoV, MERS-CoV, and SARS-CoV-2) were obtained from the NCBI Virus Database and analyzed, along with their known receptors, for sequence changes and peptide properties to determine the characteristics of virus-receptor binding. Crystal structures were retrieved from the Protein Data Base for each virus and receptor, and visualized using proteomic analysis software (PyMOL 2.1).

Results

SARS-CoV-2 displayed the largest magnitude difference (+32.4) in net charge between the virus and its receptor, angiotensin-converting enzyme 2, suggesting stronger electrostatic binding. SARS-CoV-2 also had the largest RBD (7140.29 angstroms^2), indicating more surface area for interaction with the ACE2 receptor.

Conclusion

Evolution of SARS-CoV-2 for a larger and more electrostatically “sticky” RBD compared to other pathogenic Betacoronaviruses may contribute to observations of SARS-CoV-2 having stronger or more stable binding, leading to transmissibility and infectivity. Further directions of this

project include enlarging the scope of viruses analyzed to the bat and pangolin strains to create a phylogenetic tree displaying the evolution of the virus. In addition, identifying conserved regions may facilitate the development of viable vaccines and treatments to combat the current pandemic as well as potential future pathogenic mutations.

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Georgia Research Poster Finalist - Tyler J Kristoff

Title

Healthcare Economic Burden in Adult Patients with Pancreatitis

Authors

Tyler J. Kristoff, Chandruganesh Rasendran

Introduction

While episodes of acute pancreatitis can often be managed with supportive care, severe episodes, the development of complications, or progression to chronic pancreatitis can lead to advanced inpatient and procedural care. In this study we look to investigate the healthcare economic burden of pancreatitis and factors that drive increased costs.

Methods

The Medical Expenditure Panel Survey (MEPS) was used to retrospectively analyze patient data from 2007-2015. MEPS provides a data set that compiles data on the cost and usage of health care, as well as health insurance coverage for a nationally representative population. The study population included 221,273 respondents (adults aged 18+ years), 599 of whom reported having pancreatitis. We used a cross-validated 2-part generalized linear regression model to estimate the incremental pancreatitis related expenditures independent of respondent demographics and comorbidities. Furthermore, we examined specific healthcare service sectors (inpatient, outpatient, emergency room, home health, and medications) in addition to total expenditures.

Results

Mean expenditures for cohorts with and without pancreatitis were $18031.91±2260.98 and $5362.53±60.39, respectively. Cost of care for patients with pancreatitis was 2.05 times higher (95% CI, 1.69, 2.48; p

Conclusion

These results suggest that patients with pancreatitis have a significantly increased economic burden on the healthcare system compared to those patients without pancreatic disease. Inpatient hospital management and ER visit expenditures were where the bulk of the economic burden was increased, with medication expenditures also contributing significantly. Initial management of pancreatitis after an acute episode involves lifestyle modifications such as the cessation of alcohol or tobacco usage and dietary modifications. Strategies that improve patient

education and adherence to these lifestyle modifications, particularly African American and those of poorer income populations, may help reduce recurrent episodes, progression to chronic disease, and the development of complications in these patients. Further research into why these populations experience increased cost would be beneficial in reducing the disproportional healthcare burden of pancreatitis.

Illinois Research Poster Finalist - Francesco A Fiumara

Title

Utilizing the Most Accurate Preoperative Risk Calculator, Review of Literature.

Authors

Francesco Fiumara, Wasey Ali Yadullahi Mir, Ismail Imtiaz, Victoria Lord, Sandeep Khosla, Larissa Verda

Introduction

Two of the most commonly used preoperative assessment tools utilized are the ACS National Surgical Quality Improvement Program (ACS NSQIP) and the Revised Cardiac Risk Index (RCRI). These tools seek to predict the risk of an individual experiencing postoperative complications including but not limited to: mortality, myocardial infarction, pneumonia, stroke, venous thromboembolism, and pneumonia. Many published studies seek to objectively quantify the utility of the preoperative risk calculations through retrospectively compiling patients who underwent the same or comparable surgeries in order to compare actual complications to the predicted rates.

Methods

We compiled a large number of case series that assessed the utility of these risk assessments. The validity of their conclusions was evaluated by analyzing the results as a whole. This attempts to reduce the limitations of these case series by creating a review article that increases the scale and reduces the effects of institutional bias. Both indices were reviewed for vascular, intraabdominal, transplant, non-cardiac, and neurosurgeries.

Results

The RCRI performed well in identifying preoperative risk for all of the surgeries mentioned. Cardiovascular complications in major elective vascular surgeries had the best predictive power when supplementing the RCRI with biomarkers (1). In analyzing intra-abdominal surgeries, the RCRI was shown to be the only independent predictor of perioperative outcomes (2) and predictor of major cardiac events in high risk patients (3). Postoperative cardiac events in liver transplant patients were more accurately predicted when the MELD score was supplemented with the RCRI index as compared to the MELD score alone (4).The RCRI also proved to be accurate for cardiac risk stratification when analyzing kidney transplantation as well (5). Finally the RCRI was predictive when analyzing risk of cardiac death for patients undergoing elective craniotomy. Conversely, the NSQIP fell short in consistency when accurately predicting pre-operative risk. It fell short in predicting acute adverse and cardiac events for various vascular

surgeries, including: carotid endarterectomies, infrainguinal bypasses, and endovascular aneurysm repairs (7). Regarding intra-abdominal surgery, the NSQIP was not statistically reliable and was even less predictive than a timed stair climb utilized to quantify measurable stress (8). NSQIP failed to accurately predict cardiac risk in those undergoing liver transplantation (9). Furthermore, NSQIP predictions for complications consistently fell short for neurosurgery (10).

Conclusion

Through objective analysis, we observe that the NSQIP fell short in reliably predicting postoperative complications. Conversely, more than two-thirds of the time, the RCRI was reliable in accurately predicting postoperative complications. We therefore conclude, based on existing published case studies, RCRI is the superior method of predicting pre-operative risk.

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Illinois Research Poster Finalist - Jared Hendren

Title

Loss of Glutathione Peroxidase 1 protects against colitis and increases intestinal stemness

Authors

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Introduction

Inflammatory bowel disease (IBD) is a chronic inflammatory disorder of the intestines and studies have shown elevated oxidative stress is associated with the disease pathogenesis. A family of selenium-containing proteins, known as selenoproteins (SePs), function as antioxidants, and thus, are predicted to protect against oxidative stress, inflammation, and inflammatory tumorigenesis.

Methods

We used a mouse model to understand the role of the selenoprotein, glutathione peroxidase 1 (GPx1), in maintaining intestinal homeostasis and how its expression modifies intestinal injury. Intestinal tissue from pre- and post-dextran sodium sulfate (DSS) treated GPx1 knockout mice were analyzed to determine the role of GPx1 at baseline and in the setting of intestinal injury. In addition, we investigated whether GPx1 loss affects stem cell function after injury by using organoids established from ulcerative colitis patients with GPx1 being knocked down via shRNA.

Results

At baseline, we observed increased epithelial cell proliferation with no change in cell differentiation, apoptosis, or DNA damage with the loss of GPx1. In addition, GPx1 knockout mice had increased immune cell infiltration by macrophages, neutrophils, and T cells as well as increased colonic expression of its family member, GPx2. After DSS treatment, we similarly observed increased epithelial cell proliferation with loss of GPx1; however, immune cell infiltration by macrophages and T cells was decreased in GPx1 knockout mice. Furthermore, organoids established from ulcerative colitis tissue showed increased growth rates, expression of stem cell genes such as LGR5, and proliferation following GPX1 knockdown.

Conclusion

Interestingly, our results suggest loss of GPx1 protects from colitis by increasing intestinal stemness and cell proliferation which is unlike other intestinal selenoproteins studied to date.

Illinois Research Poster Finalist - Taylor Lewis

Title

Uremia Induces Functional and Histological Changes in a Mouse Model of Arteriovenous Fistula (AVF) Stenosis

Authors

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Introduction

Arteriovenous Fistula (AVF) stenosis is responsible for a very significant morbidity, mortality and economic cost. Despite the magnitude of the clinical problem there are currently no effective therapies for AVF stenosis. The focus of this project was therefore to identify uremia specific functional and histological differences in AVF stenosis in a mouse model.

Methods

Mice were made uremic through the removal of the upper and lower poles of one kidney followed by a nephrectomy of the contralateral kidney. AVFs were created through an end (vein) to side (artery) anastomosis using standard techniques. Functional parameters included flow mediated dilation (FMD) and the area enclosed within the elastic lamina at 100 micron intervals x 12 from the AV anastomosis. The histological end point was the ratio of thrombus area/perimeter at 100 micron intervals x 12 from the AV anastomosis (with the first 600 microns being considered proximal and the second 600 microns as distal).

Results

A total of 22 mice were used in these experiments. The mean +/- SE for BUN in the uremic animals was 109+/-4.8 mg/dL as compared to 17.4 +/- 1.0 mg/dL in the control animals (p

Conclusion

These data document impairment of endothelial linked, functional (FMD and inward remodeling) and histological (thrombus formation) pathways in a mouse model of AVF stenosis. Further elucidation of the uremia specific mechanistic pathways responsible for these

differences, could result in the development of novel drugs and devices for the treatment of AVF stenosis in patients with CKD and ESRD.

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Kentucky Research Poster Finalist - Austin Stratton

Title

AVOID THE REGRET OF UNNECESSARY RADIATION: PREDICTIVE RISK FACTORS OF PULMONARY EMBOLIZATION

Authors

Mark Austin Stratton - Presenting Author Olivia Lamping MD – Author John Pidakala- Author Vikas Bhalla MD – Author Pradeep Yarra MD - Author

Introduction

Despite advances in laboratory testing and clinical decision tools, the diagnosis of pulmonary embolism (PE) in the emergency department is often elusive without the use of computed tomography pulmonary angiography (CTPA). However, CTPA exposes patients to radiation, iodinated contrast, and increased healthcare costs. Risk stratification forms the basis for clinical decision to pursue CTPA, which is based on history, physical exam and scoring systems. This retrospective study of 2226 patients who underwent CTPA in the emergency department at an academic center sought to understand factors that predict PE to better risk stratify patients.

Methods

Data was obtained for patients who visited the University of Kentucky Albert B. Chandler Hospital or Good Samaritan Hospital in Lexington, KY between June 30, 2017 and July 2, 2018 and had a CT pulmonary angiogram performed in the emergency department. Data extraction included patient's age, race, gender, treatment location and whether the patient had other medical procedures performed. The testing had to have been performed in the emergency department and included troponin, pro-NT BNP, d-dimer and chest x-rays. Statistical analysis was performed using SPSS. The frequency of each variable was calculated in both pulmonary embolism and non-pulmonary embolism groups. From this information, a Wells' score, revised Geneva score and the PERC rule were calculated for each patient individually. A receiver operator characteristic curve for the Wells' score, revised Geneva score and PERC rule out tool was generated for a negative CT pulmonary angiography test. The three testing modalities were also analyzed using standard low-end cutoff values.

Results

Risk factors associated with increased risk of pulmonary embolism include Dyspnea (69.4%), increased oxygen requirement (45.3%), surgery within the past 4 weeks (12.4%), unilateral lower extremity pain (9.4%), unilateral lower extremity edema (8.8%), and hospitalized within the past 4 weeks (28.2%). Positive CTPA scores were associated with increased age (57.2 years

avg), lower systolic blood pressure (124.1mmHg avg), lower diastolic blood pressure (77.5mmHg avg), higher d-dimer (4.63 avg), higher well's score (4.1 avg), higher revised Geneva score (5.9 avg), and higher PERC rule score (2.3 avg). Interestingly chest pain was associated with a decreased risk of PE. Heart rate, respiratory rate, and oxygen saturation were determined to have no significant association with PE risk.

Conclusion

PE provides a unique diagnostic challenge that often requires CTPA for definitive diagnosis and management which requires that patients be exposed to radiation, iodinated contrast, unnecessary procedures, and increased healthcare cost. Our study demonstrates that factors associated with increased risk of PE include increased oxygen requirement, dyspnea, unilateral lower extremity pain and edema, recent surgery, and recent hospitalization. Additionally, patients who tested positive for PE by CTPA had increased age, lower systolic and diastolic blood pressure, higher d-dimer, and higher Wells, Geneva, and PERC scores. Heart rate, respiratory rate, and oxygen saturation were found to be non-significant in those with and without PE. In conclusion, these risk factors aid in the non-invasive determination of the likelihood of PE, and therefore should be considered prior to exposing patients to the detrimental effects associated with CTPA.

Massachusetts Research Poster Finalist - Adam L Beckman

Title

Decreases in Primary Care Use and Blood Pressure Monitoring During the Covid-19 Pandemic

Authors

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Introduction

In March 2020, as part of the US response to Covid-19, CMS relaxed restrictions on telehealth services.1 But how the system's transition to virtual care affected certain patient populations and key preventive services, such as blood pressure monitoring, remains unclear. We examined differences in telehealth primary care use by patient and practice characteristics and relationship to out-of-office blood pressure (BP) monitoring.

Methods

Data comes from Aledade, a healthcare organization that works with primary care clinics to form Accountable Care Organization (ACOs).3 We used Medicare administrative data and utilization data from outbound claims collected from practice billing systems. For adjusted analyses, we estimated logistic regression models of the likelihood of any primary care visit controlling for age, sex, Medicare eligibility category, race/ethnicity, CMS Hierarchical Condition Category (HCC) risk score, and practice size/type.

Results

Between February and April, across 461,362 Medicare beneficiaries in 441 primary care clinics across 38 ACOs, the proportion of patients with any in-person primary care visit dropped by almost 50% (33% to 17%). Telehealth visits grew (0% in February to 9% of population in April), making up about half the in-person loss. Certain patient populations experienced greater decreases in their likelihood of having any primary care visit. Independent correlates of no visit included care at large practices or federally qualified health centers (FHQCs), patients >75 years, females, and those with fewer comorbidities (all P = 0.001). Black and Hispanic patients were more likely to have a primary care visit than white patients. Patients with hypertension were half as likely to have a BP reading recorded in April versus February (30% vs. 15%). Those with uncontrolled versus controlled hypertension were no more likely to have a reading.

Among patients with hypertension, those with an in-person primary care visit were more likely to have a BP measurement than those with only a telehealth visit (96% vs. 32%). There were no other patient or practice-level correlates of having a BP measurement.

Conclusion

Despite increasing telehealth utilization, primary care visits overall decreased among a group of ACOs. Certain populations in this sample of practices were less likely to access primary care during the Covid-19 pandemic, including the elderly and those served by FHQCs. It is concerning that patients with hypertension were 50% less likely to have a BP recorded in April compared with February. These findings underscore the need to improve risk stratification and outreach for people with uncontrolled hypertension. Telehealth visits had >3 times lower rate of BP follow-up documentation than in-person visits. The fact that Medicare does not reimburse home BP monitors may be contributing. Payers should consider policies to reduce financial and logistical barriers to home BP monitoring, which may be more accurate than office BPs.6 Limitations include that the data are not representative of all practices nationally.

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Minnesota Research Poster Finalist - James R Markos

Title

Characterizing COVID-19 Disruptions in the 2020-2021 Residency Application Cycle: A Survey of Fourth-year Medical Students

Authors

James R. Markos, Bradley K. Alexander, Alexandra M. Arguello, Blake A. Sowers, Gerald McGwin, Aaron R. Owen, Brent A. Ponce, Norman S. Turner

Introduction

The COVID-19 pandemic has disrupted medical education at all stages. Fourth- year medical students face particular uncertainty as they navigate a 2020-2021 residency application cycle complicated by novel pandemic-related obstacles. Our study sought to characterize the COVID-19 related challenges facing U.S. senior medical students applying to residency in the 2020-2021 cycle.

Methods

A survey was created by medical students and program directors regarding key aspects of the ERAS application form and residency matching process affected by the COVID- 19 pandemic. After securing Mayo Clinic IRB approval, the anonymous online survey was administered to fourth-year medical students via student affairs contacts at United States medical schools. Students not applying to residency during fall 2020 were excluded. Data were collected from May 15th to June 7th, 2020.

Results

Responses were received from 749 medical students applying to all major specialties. Of those surveyed, 31% will have one or more incomplete core clerkships when applying, and 60% saw their USMLE Step 2 CK exam canceled or rescheduled. Fifty-seven percent of participants had accepted or applied to an away rotation prior to rotations being canceled. The inability to interview in-person was ranked as the most negative pandemic-related change and viewed as a major (64%) or moderate (28%) inhibition to determining overall fit with programs. Nearly all respondents (98%) expressed concern regarding the pandemic's impact on their application. As a result, 79% of respondents plan to increase the number of residency programs to which they apply and 70% to rank more programs. Additionally, 10% of respondents are considering changing their desired specialty altogether due to COVID-19. Uniformly, osteopathic students experienced greater disruptions than allopathic students.

Conclusion

We identified substantial pandemic-related disruptions in the 2020-2021 residency application cycle. Recently-issued guidelines promote flexibility of application requirements, but applicants still express a high level of concern due to incomplete application components, the absence of away rotations, and transition to virtual interviews. Despite calls for application and/or interview limits, students plan to apply to and rank a higher number of programs. Our findings could inform the creation of subsequent guidelines.

Mississippi Research Poster Finalist - Katie Cranston

Title

Beyond the walls of clinical practice: Implications of multigenerational living in the context of poverty and obesity prevention among vulnerable African American families in the Mississippi Delta

Authors

Katie Cranston, MPH, MS, CHES Abigail Gamble, PhD, MS

Introduction

The structure of African American (AA) families living in poverty has historically been characterized by multigenerational, single-parent, female heads-of-household. Research suggests that adolescent pregnancy (

Methods

The Teen Mom Study is a formative mixed-methods study exploring modifiable psychosocial, cultural, and environmental determinants of perinatal physical activity. The study population (N=281) included 142 adolescents and 139 parents/guardians enrolled in the Mississippi Special Supplemental Nutritional Program for Women, Infants, and Children (WIC) and residing in the Mississippi Delta, a geographically and culturally distinct region where residents are socioeconomically disadvantaged, multigenerational families in under-resourced, rural communities.

Results

Among adolescent participants, 87% were non-Hispanic Black, 95% of all pregnant adolescents were between 15 and

Conclusion

From the data, a theoretically-based framework and conceptual model utilizing Family Systems Theory, Social Learning Theory, and Social Cognitive Theory in the cultural context of personal, proximal, and collective agency was adapted from a multigenerational life course framework and obesity prevention family ecological model. Addressing population-level health outcomes in clinical practice should include contextual considerations and include effectiveness-implementation hybrid research designs to test the effectiveness of innovative strategies for preventive services while evaluating their uptake within real-world public health and health care settings serving vulnerable populations.

Mississippi Research Poster Finalist - Alexis C Meadors

Title

Inhibition of progesterone induced blocking factor increases inflammation and markers of endothelial dysfunction in pregnant Sprague Dawley rats

Authors

Alexis C. Witcher1, Kyleigh Comley1, Jesse N. Cottrell2, Mark W. Cunningham Jr. 1, Tarek Ibrahim1 , Babbette LaMarca1, Lorena M. Amaral1

Introduction

Preeclampsia (PE) is a leading cause of maternal and perinatal morbidity in the U.S. While the pathogenesis remains unclear, PE is characterized by new onset hypertension as well as progesterone deficiency, elevated cytolytic natural killer cells (NK), inflammation, and endothelial dysfunction. Progesterone is essential in the initiation and maintenance of pregnancy. It signals the synthesis and release of progesterone induced blocking factor (PIBF) from lymphocytes that acts through inhibition of cytolytic NK cells and can regulate the proinflammatory balance which could promote endothelial regulation through suppression of endothelin-1 (ET-1) and stimulation of nitric oxide (NO). However the role of PIBF in PE pathology is not well examined. This study was designed to test the hypothesis that PIBF blockade causes inflammation and increases markers of endothelial dysfunction and hypertension in normal pregnant rats.

Methods

Rabbit anti-PIBF IgG (0.25, low dose-LD or 0.50 mg/mL, high dose-HD) was administered intraperitoneal on gestation day 15 to normal pregnant Sprague Dawley (NP) rats, on day 18 carotid catheters were inserted and on GD 19 blood pressure and samples were collected.

Results

MAP in NP rats (n=7) was 99+ 3 mmHg, which increased to 116+ 2 in NP+ anti-PIBF LD (n =10) and 113+4 in NP+ anti-PIBF HD (n=6), p

Conclusion

In conclusion, our study demonstrates that PIBF blockade indeed causes hypertension, inflammation and increased markers of endothelial dysfunction, all of which are associated with PE.

Missouri Research Poster Finalist - Karam Atli

Title

The Impact of Surgical Chronology on Outcomes of Patients Receiving Lumbar Spine and Lower Extremity Joint Surgeries

Authors

Karam Atli, MS; Gabriel Smith, MD; Konrad Knusel, MS; Edward Benzel, MD; Ajit Krishnaney, MD; Michael Steinmetz, MD; Thomas Mroz, MD

Introduction

The aging population and obesity epidemic indicate that increasingly more patients with lumbar spine pathology will likely also develop lower extremity joint (LEJ) disease (hip and/or knee). These patients may have co-existing lower back and extremity pain, the major source of which (spine vs. LEJ) is difficult to determine. There remains a lack of outcomes data of patients who receive surgeries for both an LEJ and the lumbar spine within a short period based on chronology of surgery type. This is the first report that evaluates the differences in surgical outcomes of patients receiving lumbar surgery following LEJ surgery compared to receiving lumbar surgery before LEJ surgery.

Methods

Retrospective chart review was performed of patients undergoing lumbar surgery between 2008-2015 and receiving hip/knee surgery within three years prior/ following lumbar surgery at a single institution. Pre- and post-operative outcome measures were assessed using the EuroQol five dimensions questionnaire (EQ5D) and Pain Disability Questionnaire (PDQ).

Results

670 patients were included. Patients receiving lumbar surgery first were 4.75 times more likely to reach the minimal important difference in PDQ. Patients receiving LEJ surgery first had a higher mean Charlson Comorbidity Index. Male patients were 37% less likely to be readmitted within 90 days of either procedure.

Conclusion

Postoperatively, patients who received lumbar surgery before LEJ surgery had greater improvement than patients who received LEJ surgery before lumbar surgery. These findings suggest that in patients with a co-existing need for lumbar and LEJ surgery, greater consideration should be given to providing lumbar surgery before LEJ surgery. The findings of

this study are applicable to multiple disciplines including primary care, orthopedics, and neurosurgery, and warrants further large-scale prospective investigation to determine the cause and generalizability of these surgical outcomes results.

Missouri Research Poster Finalist - Sukruth A Shashikumar

Title

The impact of accounting for poverty on financial penalties in a federal value-based payment program

Authors

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Introduction

The Hospital-Acquired Condition Reduction Program (HACRP) is a value-based payment program from the Centers for Medicare and Medicaid Services (CMS) that deducts 1% of Medicare payments from the quartile of hospitals that perform the worst with respect to 6 measures of in-hospital adverse events. Controversially, hospitals serving a greater proportion of patients from minority and low socioeconomic backgrounds are more likely to perform worse than the national benchmark and to receive penalties. Some of these disparities may reflect differences in the underlying health and susceptibility of hospitals' patient populations, rather than differences in the quality of care delivered. Therefore, the HACRP could exacerbate health care inequities by withholding Medicare dollars from hospitals caring for patients from the most vulnerable backgrounds. Hospitals' dual proportion (the proportion of their patients dually enrolled in Medicare and Medicaid), a marker for patient poverty and social risk factors, is an independent factor strongly associated with adverse outcomes. Stratification and evaluation of hospitals within 5 peer groups of dual proportion (instead of within 1 national cohort) may thus represent a practical solution to more equitably assessing performance in the HACRP.

Methods

In this economic evaluation using publicly available observational data, we stratified 3,177 hospitals evaluated by the HACRP into 5 quintiles based on their proportion dual. Within each quintile, we evaluated hospitals' performance and tagged for penalization the worst-performing quartile. We calculated penalties as deductions of 1% from the hospital's estimated total Medicare inpatient payments. We tested for association between baseline characteristics and penalization status under the prestratification scheme using Pearson χ^2 tests. At the level of

each hospital characteristic, we tested the percent change in penalization status under the pre- vs. post-stratification schemes using McNemar's test.

Results

We found that the HACRP disproportionately penalizes hospitals that are large, publicly owned, teaching, in the Northeast, and in Medicaid-expansion states, as well as those caring for high proportions of patients with disabilities and from racial/ethnic minority backgrounds. Hospitals less likely to receive penalties after stratification included safety-net hospitals (33.6% penalized before stratification vs. 24.8% after stratification, ??=?–8.8 percentage points [pp], P?

Conclusion

If the HACRP stratified hospitals and evaluated their performance within peer groups based on the proportion of their patients in poverty, disparities between penalized and non-penalized hospitals would narrow, and safety-net hospitals would see an estimated total savings of over $32 million. CMS should consider adopting stratification when assessing hospital performance in the HACRP.

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Nebraska Research Poster Finalist - Ahna E Buntrock

Title

Physician Responses to Pharmacogenomic Testing with Prescribed Medications in an Outpatient Clinical Setting

Authors

Ahna Buntrock, MS4; Jordan Baye, PharmD; April Schultz, PharmD; Eric Larson, MD; Catherine Hajek, MD

Introduction

This study investigates the responses of physicians to pharmacogenomic testing at Sanford Health. Selective serotonin reuptake inhibitors (SSRI's) are common medications prescribed by primary care physicians for various conditions. Unique drug-gene metabolism can be determined for patients and this information can be used to assist in medication changes to ensure adequate treatment response. The aim of this study was to determine whether physicians are more likely to act and switch SSRI medications when notified that a patient has a unique drug-gene interaction affecting metabolism.

Methods

This study included a retrospective chart review of patients who received pharmacogenomic testing, followed by determination of the responses of their prescribing physicians toward the alert notifications concerning their results. The SSRI prescribing physicians were limited to primary care specialties – family medicine, internal medicine, psychiatry, and obstetrics and gynecology. Data collected included CYP2C19 and CYP2D6 phenotype and genotype, response of the prescribing physician, and the documented reason for the medication change. Reasons for medication change were categorized in one of 5 groups: patient discontinued on own accord, Sanford pharmacogenomic chip results, unknown, side effects, or ineffective medication. 702 patients' charts were reviewed and drug interaction alerts for 6 different medications (Citalopram, Escitalopram, Fluoxetine, Fluvoxamine, Sertraline, and Paroxetine) were analyzed.

Results

The preliminary results showed that when presented with a unique drug-gene metabolism alert notification, only 14.21% of physicians documented changing the medication and attributed the change to the pharmacogenomic testing results. Of the documented medication changes attributed to the pharmacogenomic testing, 58.33% of medication changes occurred in

response to the alert notification. 41.67% of these medication changes occurred without the alert notification.

Conclusion

Further data collection and analysis will determine prescribing differences among the different specialties. This collected information on the pharmacogenomic testing is essential for prescribing physicians in the future. Drug metabolism is an important piece of a patient's treatment. Whether it is alert fatigue, or systematic faults, not addressing this crucial drug metabolism knowledge could result in less than adequate care for patients.

Nevada Research Poster Finalist - Chalette Lambert-Swainston

Title

Histopathologic Detection and Localization of Basal Cell Carcinoma in Complex Whole Slide Images Using Convolutional Neural Networks and Multiple Instance Learning

Authors

Chalette Lambert, Tuatini Godard, James Requa, Emma Stanton, Gregory Osmond MD

Introduction

Basal cell carcinoma (BCC) is an increasing public health concern, with 2.5 million cases treated annually in the U.S[1] and incidence increasing three- to four-fold over the past thirty years.[2] Although BCC lesions typically have a distinctive clinical appearance, diagnostic confirmation by biopsy prior to treatment achieves the highest standard of care. BCC lesion size is the primary determinant of treatment cost, complexity and morbidity, making early detection critical in improving the burden of BCC diagnosis.[2, 3] In addition, BCC outcomes are dependent on the accuracy of histopathological diagnosis, which is strongly influenced by inter-observer variability[4] as well as access to specialty care.[5] Unfortunately, access to specialty care is decreasing as the pathology workforce is shrinking, and BCC screening is often completely neglected in areas of low socioeconomic status.[6,7] Computer-assisted diagnosis at the histopathologic level can bridge the gaps in access to specialty care and improve early detection and costs.

Methods

We propose a novel method for machine learning based detection and localization of BCC from whole slide images (WSIs) using neural networks. Our multi-stage fully automated process includes a quality assessment (QA) stage self-regulated by an anomaly detection algorithm responsible for tracking & managing acceptable tolerances for histology slide digitization including staining and scanning, a convolutional neural network capable of fine-grained detection & localization of BCC at the cellular level, and an attention-based deep multiple instance learning algorithm responsible for aggregating a comprehensive WSI-level diagnosis reconstructed from identified regions of interest (ROIs). For our histopathologic training dataset, 2024 WSIs curated from a histotechnology laboratory located in Murray Utah as random deidentified samples between 2013 and 2018, were annotated for BCC as well as other commonly encountered skin conditions including squamous cell carcinoma, melanocytic lesions, actinic keratosis, verruca vulgaris, seborrheic keratosis, and healthy tissue. All annotations were independently validated by a minimum of two dermatopathologists. For validating the performance of our trained BCC algorithm, we conducted a retrospective

validation study of 2756 clinical WSIs randomly selected and consisting of skin lesions of various types including BCC.

Results

Our trained algorithm detected BCC with an accuracy of 99.13% (95% CI 98.71 - 99.44%), sensitivity of 97.85% (95% CI 97.31 - 98.39%), specificity of 99.27% (95% CI 98.95 - 99.59%), F2 score of 0.9701 (95% CI 0.9637 - 0.9765), and AUC of 0.9899 (95% CI 0.9862 - 0.9936).

Conclusion

These results demonstrate that our algorithm is capable of self-regulating QA for histology slides digitization to WSIs as well as detecting & localizing BCC with high sensitivity and specificity using fully automated methods. As such, we believe that our algorithm and novel approach is poised to advance the field of computer-assisted skin cancer detection.

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Nevada Research Poster Finalist - Chalette Lambert-Swainston

Title

Histopathologic Detection and Localization of Basal Cell Carcinoma in Complex Whole Slide Images Using Convolutional Neural Networks and Multiple Instance Learning

Authors

Chalette Lambert-Swainston, Tuatini Godard, James Requa, Emma Stanton, Gregory Osmond MD

Introduction

Basal cell carcinoma (BCC) is an increasing public health concern, with 2.5 million cases treated annually in the U.S[1] and incidence increasing three- to four-fold over the past thirty years.[2] Although BCC lesions typically have a distinctive clinical appearance, diagnostic confirmation by biopsy prior to treatment achieves the highest standard of care. BCC lesion size is the primary determinant of treatment cost, complexity and morbidity, making early detection critical in improving the burden of BCC diagnosis.[2, 3] In addition, BCC outcomes are dependent on the accuracy of histopathological diagnosis, which is strongly influenced by inter-observer variability[4] as well as access to specialty care.[5] Unfortunately, access to specialty care is decreasing as the pathology workforce is shrinking, and BCC screening is often completely neglected in areas of low socioeconomic status.[6,7] Computer-assisted diagnosis at the histopathologic level can bridge the gaps in access to specialty care and improve early detection and costs. We propose a novel method for machine learning based detection and localization of BCC from whole slide images (WSIs) using neural networks.

Methods

Our multi-stage fully automated process includes a quality assessment (QA) stage self-regulated by an anomaly detection algorithm responsible for tracking & managing acceptable tolerances for histology slide digitization including staining and scanning, a convolutional neural network capable of fine-grained detection & localization of BCC at the cellular level, and an attention-based deep multiple instance learning algorithm responsible for aggregating a comprehensive WSI-level diagnosis reconstructed from identified regions of interest (ROIs). For our histopathologic training dataset, 2024 WSIs curated from a histotechnology laboratory located in Murray Utah as random deidentified samples between 2013 and 2018, were annotated for BCC as well as other commonly encountered skin conditions including squamous cell carcinoma, melanocytic lesions, actinic keratosis, verruca vulgaris, seborrheic keratosis, and healthy tissue. All annotations were independently validated by a minimum of two dermatopathologists. For validating the performance of our trained BCC algorithm, we

conducted a retrospective validation study of 2756 clinical WSIs randomly selected and consisting of skin lesions of various types including BCC.

Results

Our trained algorithm detected BCC with an accuracy of 99.13% (95% CI 98.71 - 99.44%), sensitivity of 97.85% (95% CI 97.31 - 98.39%), specificity of 99.27% (95% CI 98.95 - 99.59%), F2 score of 0.9701 (95% CI 0.9637 - 0.9765), and AUC of 0.9899 (95% CI 0.9862 - 0.9936).

Conclusion

These results demonstrate that our algorithm is capable of self-regulating QA for histology slides digitization to WSIs as well as detecting & localizing BCC with high sensitivity and specificity using fully automated methods. As such, we believe that our algorithm and novel approach is poised to advance the field of computer-assisted skin cancer detection.

References

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New Mexico Research Poster Finalist - Promise Bood

Title

The Influence of Institutional Trust on the Academic Decisions of Medical Students

Authors

Promise Bood MS2, Hannah Howse MS2, Patrick Rendón M.D., Tom Markle PhD

Introduction

Research in regard to medical students' trust in their institution and willingness to follow the presented curriculum is currently lacking, yet the student-school trust dynamic may offer potential insight into the academic performance, study methods, and clinical confidence of future physicians. We are conducting a series of surveys and interviews to gather information from pre-clerkship students concerning trust in their medical institution, and how that trust shapes their interaction with the curriculum.

Methods

An initial survey, distributed to pre-clinical medical students, was designed to gauge their trust in relation to board exam preparation and their curriculum, as well as the institution. Analysis of the open-ended answers from the survey prompted an exploration into several themes related to trust: trust in institution vs. third-party resources, resolving discrepancies between these resources, and approaches to teaching that lend to students' confidence in curriculum. These themes were were further discussed in a focus group setting. Two classes of pre-clinical medical students have each participated in a single round of the survey and focus group analyses.

Results

Of the 101 survey responses, 49% of respondents indicated they were 'neutral' that the school was "adequately preparing [students] for STEP 1". Focus group discussions exposed strengths in the curriculum including 'instructor reliability' and 'organization'. These discussions also resulted in recommendations for interventions, including 'faculty acknowledgment of STEP 1' and 'consistency' in instruction methods in order to support a comfortable and trustworthy learning environment.

Conclusion

Based on available data, students perceive there to be a lack of harmony between the curriculum, as presented, and future board exams. Our initial recommendation is to have board

pertinent information clearly outlined within the curriculum, while also emphasizing that certain topics may hold greater clinical importance. This research could provide invaluable information to medical educators concerning students' perception of best practices when creating and presenting material to optimize student reception and engagement with the curriculum. This research is ongoing, and our intent is to perform more data collecting cycles for each class as they progress through the medical curriculum, and determine if their perception of trust in the medical school changes after the completion of board examinations.

New York Research Poster Finalist - Nimra Hameed

Title

THE EFFECT OF DEXMEDETOMIDINE ON DECREASING POSTOPERATIVE PAIN AND NARCOTIC CONSUMPTION AFTER LAPAROSCOPIC CHOLECYSTECTOMY: A SYSTEMATIC REVIEW AND META-ANALYSIS

Authors

Nimra Hameed B.S.1, Reona Kimura B.A.1, William Guo B.A.1, Julia Miao B.A.1, Joy Schabel M.D.2

1Renaissance School of Medicine at Stony Brook University, NY, USA

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Introduction

Laparoscopic cholecystectomy is the gold-standard procedure for gallbladder removal which still has significant postoperative pain and opioid use associated with it; therefore, different forms of anesthesia need to be explored for this procedure. Dexmedetomidine, an alpha-2 adrenoceptor agonist, is a useful non-opioid adjuvant in multimodal anesthesia for laparoscopic cholecystectomies. The authors conducted a systematic review and meta-analysis to assess the effect of dexmedetomidine on postoperative pain, narcotic consumption, and time to first use of rescue analgesia after laparoscopic cholecystectomy. Post-operative nausea and vomiting and secondary outcomes including satisfaction scores and sedation scores were also reviewed.

Methods

Four electronic databases (PubMed, EMBASE, Cochrane, and Web of Science) were searched for articles prior to April 18th, 2020. Primary research articles that discussed postoperative pain in laparoscopic cholecystectomy patients receiving dexmedetomidine were included. Articles of all ages and languages were included. All statistical data analyses were performed using R programming (R x64 3.5.2), RevMan 5.4, and Microsoft Excel 2016.

Results

A total of 27 RCTs with 2,272 patients who received dexmedetomidine after undergoing laparoscopic cholecystectomy were included. Meta-analysis showed that the Visual Analog Scale (VAS) scores, a measure of postoperative pain, in the dexmedetomidine group were significantly lower than that of the control group. The mean difference (MD) for VAS scores at

hour 4 was -0.79 (95% CI: -1.45, -0.14, P=0.02), hour 12 was -1.28 (95% CI: -2.21, -0.35, P=0.007) and hour 24 was -1.40 (95% CI: -2.24, -0.40, P=0.0006). Narcotic consumption was significantly decreased in the dexmedetomidine group with a MD of -4.08 (95% CI, -6.62, -1.54, P=0.002). Time to first rescue analgesia was significantly longer in the dexmedetomidine group with a MD of 26.65 (95% CI, 87.95, 165.35, P

Conclusion

This systematic review found dexmedetomidine to be effective in reducing postoperative pain and narcotic consumption and increasing time to first use of rescue analgesia. One important implication of this systematic review is that it provides evidence of dexmedetomidine being a useful addition to a multimodal analgesia regime by decreasing postoperative narcotic consumption. Minimizing opioid use during the perioperative period is an important goal for physicians with the development of chronic opioid use in opioid-naive patients. In addition to reduced pain, patients given dexmedetomidine experienced fewer side effects of postoperative nausea and vomiting and reported increased satisfaction. However, dexmedetomidine comes with its drawbacks, namely increased sedation.

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Ohio Research Poster Finalist - Brenden Drerup

Title

Provider Performance and Patient Satisfaction of Telehealth During the COVID-19 Pandemic

Authors

Brenden Drerup, Joseph Wiedemer MS, Jennifer Espenschied, Marie Kan MD, Brianna Donaldson DO, Lisa Hamilton MD

Introduction

The unprecedented COVID-19 pandemic thrusted the relatively novel approach of telemedicine to the center stage of healthcare infrastructures within the United States and around the globe, leading to a dramatically increased utilization of telehealth services. Since the first reported case of COVID-19 in the U.S. on January 20, 2020, telemedicine has played an instrumental role in reducing viral transmission by preserving personal protective equipment and supporting crippled healthcare revenue streams. The convenience of telehealth services has also reduced caregiver burden and travel costs for patients. Prior to the COVID-19 pandemic, studies have consistently demonstrated a strong association between telehealth utilization and increased patient satisfaction. The impact of telemedicine on patient satisfaction during the current pandemic has yet to be fully understood. This study aimed to identify patient perspectives and satisfaction with the virtual appointments during the COVID-19 pandemic to help guide future implementation of telehealth services. We also attempted to discern statistically significant differences between the utilization of video conferencing versus telephone-only telehealth visits.

Methods

This prospective patient survey study was performed at a Primary and Specialty Care Clinic in Columbus, Ohio on patients seen in March-May 2020. Patients completed a survey either in person at their in-office visit or were contacted by phone following their telehealth visit. The survey analyzed multiple satisfaction metrics including friendliness of registration staff, convenience of appointment times, and communication with physicians. The rates of missed appointments, both in person and telehealth, were also collected.

Results

Between March 16th – May 1st, 2020, the no-show rate of 7.5% for telehealth visits was statistically significantly lower than the in-office visit no-show rate of 36.1% during the pandemic (p

Conclusion

Telehealth appointments resulted in comparable and positive overall patient satisfaction metrics with a significant reduction in missed appointments compared to those who had in-person office visits both during and before the pandemic, despite registration staff not being rated as friendly and patients feeling like they did not spend as much time with their physician during telehealth visits compared to in-office visits. There were no differences in satisfaction metrics between patients who had a video versus a phone-only telehealth visit. Collectively, this data strongly supports the widespread utilization of telemedicine during and following the COVID-19 pandemic.

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Ohio Research Poster Finalist - Melissa Hernandez

Title

Rural Obesity Medical Education for Primary Care in West Virginia: A Needs Assessment

Authors

Laura Davisson, MD, MPH, FACP; Melissa A. Hernandez-Pachon, BS; Treah S. Haggerty, MD, MS 3,4

Introduction

Obesity is a serious disease associated with adverse health effects and costs. West Virginia (WV) has one of the highest obesity rates in the nation. Addressing obesity largely falls on primary care practitioners, but many feel ill-equipped to counsel patients on weight loss. It is critical for clinicians to be adequately trained to treat obesity. We conducted this study to assess the obesity medical education needs of WV primary care practices.

Methods

Data was collected from 17 health systems through WV Practice-Based Research Network's Collective Outreach and Research Engagement survey. Survey results were analyzed using descriptive statistics to summarize demographics; obesity treatment knowledge and confidence; topics of interest; and preferred educational delivery methods.

Results

The majority of respondents agreed that medical training in obesity should be strengthened (96.4%). Relatively low confidence levels were reported for prescribing anti-obesity medications (49.4%), optimizing chronic medications for weight (61.0%), and counseling/managing patients before/after bariatric surgery (52.4%). Highest reported interest levels were in strategies for discussing weight with patients (87.2%), food and nutrition (85.7%), physical activity plans (84.4%), motivational interviewing (84.0%), and optimizing chronic medications for weight (79.2%). The highest rated educational delivery method was virtual Continuing Medical Education (CME) (91.5%) with lecture format (89.0%).

Conclusion

These results can be used to develop obesity medical education for primary care that can ultimately help to reduce health disparities in rural WV. An educational plan should ideally be delivered in virtual CME lecture format and should address lifestyle modifications, motivational interviewing, bariatric surgery, and obesity pharmacotherapy.

Oklahoma Research Poster Finalist - Ahmed A Abdelmonem

Title

PDSA Cycles Increase Screening For Smoking Cessation

Authors

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Introduction

Smoking represents the leading cause of preventable disease, disability and death in the United States, disproportionately affecting lower-income populations. Smoking cessation has been shown to reduce the associated health risks and to lead to a decrease in early mortality. Due to the significant impact of smoking on our patient population, the students at OU's student-run, free clinic, Bedlam Clinic, decided to implement a series of Plan-Do-Study-Act (PDSA) cycles to address this issue. PDSA cycles are widely used for quality improvement in healthcare systems and have been shown to improve outcomes. Our aim was to improve tobacco screening and counseling in OU Bedlam student-run clinic by 20% by June 2020.

Methods

From September 2019-May 2020, teams of third-year medical students, PA students, nursing students, social work students, and faculty attendings implemented PDSA rapid improvement cycles. The goal was to increase smoking screening and cessation education above the current baseline of 49.4% by the end of the year. Each individual team created a plan, which they implemented in the clinic. The number of screenings, counseling sessions, and smoking cessations were recorded per team. The teams met bi-monthly to discuss and improve upon the plan. By the third PDSA cycle, the entire clinic agreed to implement the protocol of the team with the largest increase in tobacco screenings. The protocol chosen involved an interdisciplinary approach: the nursing student initiated the screen, the Medical/PA student provided counseling for those interested, and the social work student provided resources for those motivated to quit smoking.

Results

At the first PDSA cycle, 49.4% of eligible patients at Bedlam Clinic had a tobacco screening completed, with an upper and lower confidence level of 53.6% and 45.1%. Monthly data points following the initial PDSA cycle were consistently above average. By July, 2020, after 4 PDSA cycles, the average tobacco screening rose from 49.4% to 59.8%.

Conclusion

Implementing a multidisciplinary, quality improvement project to increase smoking cessation screening at the OU Bedlam student-run clinic was successful. Tobacco screening at the Bedlam Clinic improved by 20.1% from its baseline. The PDSA cycles elucidated that documentation of the tobacco screening process was being recorded incorrectly in the EMR. Once this was established, we implemented a protocol ensuring that this important step was not forgotten. Specifically, nursing students documented the screening in the EMR at the beginning of the visit. This step was implemented across the entire clinic by February 2020, significantly improving tobacco screenings. This project demonstrates that a student-led, annual, QI project using simple rapid cycle improvement leads to improved patient care. These projects should continue to be implemented at the Bedlam Clinic and further expanded to the remaining OU clinics.

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Oklahoma Research Poster Finalist - Auston D Stiefer

Title

CLUSTER ANALYSIS AS MORE PRECISE MEASURE OF BURNOUT AMONG HEALTHCARE PROVIDERS

Authors

Auston Stiefer, MS3, Krista Kezbers, PhD, DipACLM, Tessa Austin, MS2, Amy Nguyen, BS, Heather McIntosh, MS, CRA, Bryan Touchet, MD

Introduction

Burnout among physicians and medical trainees has been heavily investigated in the last decade, given its high prevalence and implications on poor patient outcomes. However, physician burnout, widely assessed via abbreviated versions of the Maslach Burnout Inventory (MBI), has previously ignored the multidimensional properties of this psychometric measure.[1,2] This study aims to identify distinct burnout "clusters" among academic medical professionals and trainees based on MBI subscores.

Methods

This secondary data analysis was conducted using a large dataset from the 2019 OUSCM's well-being survey, including the MBI with subscores. Using a new analytic approach recommended by creators of the MBI, we performed additional two-step cluster analysis on the dataset to better characterize our population. Two-step cluster analysis in SPSS was utilized to analyze mean values of the 3 MBI subscales and to understand similarities, differences, and clusters within the dataset.

Results

Burnout subscores from 272 participants were analyzed. Sample demographics included: mean age 39.4, 78.0% female, 75.1% white, 57.2% staff. Preliminary results of the cluster analysis indicated 2 distinct clusters, with cluster quality, while subsequent analysis revealed 3-, 4-, 5-, and 6-cluster models all with fair cluster quality. Investigators found the 4-cluster model most consistent with existing literature, identifying the following distinct clusters: 1) respondents with high subscores in both cynicism and exhaustion, 105 (38.6%); 2) respondents scoring highly only in exhaustion, 62 (22.8%); 3) those scoring highly only in inefficacy, 58 (21.3%); and 4) those scoring lowly in all areas, 47 (17.3%). A larger sample of greater than 300 participants was needed to achieve the highest measure of cluster quality, and differences among subscore mean values within models of 5 or more clusters had decreasing magnitude.

Conclusion

The emergent four-cluster pattern is consistent with preliminary cluster analysis on burnout subscores among mental health professionals, and this method identifies individuals who share similar patterns of burnout subscores, previously considered outliers. Additionally, mean subscores within our sample's four-cluster model included lower levels of professional inefficacy when compared to four-cluster burnout patterns in other professional populations.[3] This suggests that healthcare providers may maintain higher levels of professional efficacy when experiencing burnout compared to other professionals. Lastly, identifying specific dimensions of burnout within a population provides greater understanding of how individuals experience burnout and how their environments contribute to burnout.

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Oregon Research Poster Finalist - Allen Huang

Title

A Review of Recent Developments in Turner Syndrome Research

Authors

Allen Huang

Introduction

Turner syndrome is a rare disorder resulting from the complete or partial loss of an X chromosome. Relatively common in the context of cytogenetic disorders, it occurs roughly once per 2500 live female births. It is estimated that the vast majority of fetuses with Turner genotype are spontaneously aborted early in utero. There is significant variability in both karyotype and phenotype, and patients with the same karyotype may present very differently clinically. The most common karyotype is a complete deletion of one X chromosome (45,X0) but partial deletions, mosaicism, isochromosomes, and ring chromosomes are also implicated. Common manifestations include delayed growth, premature ovarian failure, congenital heart defects, endocrine disorders, lymphedema, and webbed neck though the presentation is highly varied. Turner syndrome patients are at significantly increased mortality risk, primarily due to cardiovascular abnormalities. Major congenital cardiac abnormalities associated with Turner Syndrome include bicuspid aortic valve and coarctation of the aorta, while significant acquired defects include aortic aneurysm and dissection. There is, however, an incomplete understanding of the mechanisms that lead to this presentation. Recent research in Turner Syndrome has been directed at identifying exactly how the loss of genetic material leads to the Turner phenotype.

Methods

A literature review was performed to include articles published within the last 5 years. Articles found through the Pubmed database as well as the presentations from the Turner Syndrome Resource Network Symposium. Articles published before 2015 were excluded unless no article had been published more recently on the same topic.

Results

Several loci of interest have been identified on the X chromosome and have been linked to aspects of the disease. The SHOX gene was the first gene identified, and it has been associated with the growth failure resulting in short stature seen in Turner patients. The TIMP1 gene has been associated with bicuspid aortic valve, and the KDM6A gene with hyperinsulinism. Additionally, epigenetic differences in gene expression present a supplemental explanation for

the pathology. It has been established that the Turner genome has a distinct methylation status from a euploid individual, with genome-wide hypomethylation. Analysis of parental origin of the retained X chromosome may provide further insight into both the cause and presentation of Turner syndrome. Epigenetic research is a relatively recent approach and remains in the initial stages.

Conclusion

The understanding of the mechanism of Turner syndrome remains incomplete. Genes localized to the p arm of the X chromosome are the best candidates for relating genetic loss to pathology. A multifactorial explanation including both genetic and epigenetic mechanisms will be necessary. Future research further establishing how genetic loss like a TIMP1 gene deletion leads to bicuspid aortic valve could have significant implications for the management of common morbidity in Turner syndrome.

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Oregon Research Poster Finalist - Caroline King

Title

Improving Naloxone Prescription Fills Among Patients With Oregon Medicaid Seen By A Hospital-based Addiction Consult Service: A Modeling Study

Authors

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Introduction

In 2020, opioid overdose deaths, exacerbated by increasing drug-supply contamination and the SARS-COV-2 pandemic, continued to rise. Hospitalization represents a high-risk touchpoint, after which people are at increased risk for overdose and death. Naloxone, an opioid overdose reversal drug, can help reduce fatal overdoses. As the number of patients hospitalized with Opioid Use Disorder (OUD) also continues to grow, hospitals remain an integral part of naloxone distribution systems. Yet, little is known about how naloxone prescribing or pharmacy naloxone availability translate to naloxone-in-hand for patients. The objective of this study was to understand where intervention in the naloxone care continuum could increase the number of patients with naloxone-in-hand.

Methods

We built a Markov model, populated with data from Oregon Medicaid enrollees who were seen by an inpatient addiction medicine consult service from 2015 to 2018. In our model, patients are admitted to the hospital with OUD, prescribed naloxone or not, and have naloxone dispensed or not, by 30 days post-discharge. We pre-specified nine scenarios to understand how interventions might impact naloxone prescriptions filled. We report the estimated percentage of naloxone dispenses from our base model, as well as from each scenario.

Results

During the study window, 153 of 197 (78%) study participants were prescribed naloxone; 83 of 153 (54%) had naloxone dispensed. Seven patients not prescribed naloxone in the hospital had naloxone dispensed after discharge (16%). Increasing naloxone prescribing from 78% to 95% increases naloxone dispensed from 46% to 52%. Among patients who had any other medication dispensed after discharge, increasing prescribing to 95% increases naloxone dispensed from 51% to 57%. Among all patients, to reach naloxone dispense rates of approximately 50%, 75%, and 95%, prescribing rates must increase to 95% and prescription dispense rates must increase to at least 53%, 79%, and 99%.

Conclusion

Within an inpatient addiction consult service that treats patients with OUD, naloxone prescribing was high, but only half of patients had naloxone dispensed by 30 days post discharge. Additionally, in the face of barriers to naloxone dispenses, increasing prescribing does little to increase the number of patients with naloxone-in-hand. Future work is needed to understand barriers to naloxone dispenses after hospital discharge, and should explore patient, provider, and pharmacist perceptions of gaps in the naloxone care continuum, and opportunities to support broad naloxone distribution among hospitalized adults.

Oregon Research Poster Finalist - Rebecca Miles

Title

"Comparison of Non-Surgical Treatment Options for Chronic Exertional Compartment Syndrome (CECS)"

Authors

Rebecca Miles, 2LT, MS1 USA, Teonette Velasco, PT, DPT, OCS, Jeffrey Leggit, MD, CAQSM

Introduction

Chronic Exertional Compartment Syndrome (CECS) is a debilitating disorder that causes lower extremity pain most commonly in active populations. It is thought to arise from increased pressure in muscle compartments (commonly lower extremity anterior and lateral) leading to pain, paresthesia and an inability to tolerate exercise. The cause of CECS is unknown but is likely a combination of muscular, neurologic and vascular contributions. Current standard treatment is surgical fasciotomy, but it is only successful in 66% of patients. Many have complications and/or need repeat procedures. Efficacy is even worse in military members at 55%. Other alternative strategies have emerged such as botulinumtoxin A injections (BoNT-A) and gait retraining, but data is limited. The objective of this study is to simultaneously assess the effectiveness of non-surgical treatments, BoNT-A injections and Supervised Gait Retraining (SGR), in terms of lower pain control and ability to return to full duty among adult active-duty service members suffering from lower extremity CECS, specifically of the anterior and/or lateral compartments.

Methods

This study will be one of the first randomized clinical trials using a control group (saline injections) in studying treatments of lower extremity CECS. The project is a multi-site single-blinded randomized placebo-controlled study with 620 subjects divided into 4 separate treatment groups. Evaluation of treatment results will include the following outcome measures: return to full duty sooner, improvement of pain and ability to complete PT test. We predict the use of both BoNT-A injections and SGR will be more effective than either treatment alone. In adult active-duty patients, the combined use of these treatments will return service members to full duty, including being able to complete service specific military physical tests, sooner and for longer periods than either treatment alone.

Results

The study is progressing steadily, and data collection is ongoing at the time of this abstract submission. We anticipate that prior to presentation at the May meeting we will obtain enough data for either the complete analysis or at least an appropriate interim analysis.

Conclusion

Results will inform the development of new therapeutic approaches and practice guidelines, and help physicians and warfighters maintain readiness and physical prowess of fighting force.

References

1. The opinions and assertions contained herein are those of the authors and do not reflect those of the Uniformed Services University or the Department of Defense.

Oregon Research Poster Finalist - Emily S Mitchell

Title

Small Changes, Positive Impacts: How Online Modules Change Medical Student Perspectives on Value-Based Care

Authors

Emily Mitchell*; Erin Urbanowicz, MPH*; Andrea Smeraglio, MD*; Caroline King, MPH*
*Oregon Health and Science University

Introduction

As healthcare costs spiral out of control, new avenues to raise awareness about value-based care amongst the next generation of clinicians are being explored. Education initiatives include value-based care electives, integration of health systems learning in small classroom settings, and utilizing students as change agents. (1-4) Students and Trainees Advocating for Resource Stewardship (STARS) is a student-led, grassroots effort to raise awareness and advocate for changes related to resource stewardship. (2) Two student members of STARS from Oregon Health and Science University utilized publicly available Dell Medical School Value-Based Care Modules to educate their peers on value-based care principles in an effort to affect knowledge and attitudes.

Methods

Students were provided the option to complete an online module “Introduction to Value-Based Health Care” during a post-finals extracurricular week along with an anonymous pre-post Qualtrics survey. The survey contained four knowledge-based questions to reflect completion of the module and three attitudes-based questions (ABQs). The ABQs were graded on a 4-point Likert scale asking students’ feelings on unnecessary tests in the health care system, their power to reduce costs for patients, and their power to control cost in the system. Data was analyzed using paired t-tests.

Results

144 pre-clinical students completed the pre-survey, 122 completed the post-survey. After deleting duplicate identifiers and unmatched data, 120 data points remained. All ABQs showed statistically significant change. Post module completion, unnecessary testing was deemed a more serious problem (3.24 to 3.77, p

Conclusion

Using publicly available online modules, two medical students created a curriculum to introduce value-based care to their peers. These results show a positive impact on student self-perceived power to control patient cost and knowledge of value-based care. These modules and other modules in the series are now provided as an option for every enrichment week. This was an easy and publicly available way for two students to engage and prime their peers to learn about value-based stewardship.

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Oregon Research Poster Finalist - Karishma Patel

Title

Characteristics and Outcomes of Pregnant Women with Cardiac Disease

Authors

Karishma Patel, Lidija McGrath, MD, Paola Roldan, MD, Kathleen Brookfield, MD, PhD, Emmanuelle Paré, MD, Abigail Khan, MD, MSCE, Oregon Health and Sciences University (OHSU)

Introduction

Congenital heart disease (CHD) is the most common major birth defect. An increasing number of women with CHD now reach childbearing age and pursue pregnancy. CHD is a risk factor for cardiac events in pregnancy, including heart failure, arrhythmia, and thrombosis. With this in mind, a combined cardiology and maternal fetal medicine program was established at Oregon Health and Sciences University in 2016, the first and only program of its kind in the state. We conducted a retrospective study to explore the characteristics and outcomes of pregnant women from our clinic with congenital or acquired heart disease.

Methods

We performed a retrospective chart review of women with heart disease in pregnancy who were seen at our clinic between 12/2016 and 7/2020. Data regarding patient demographics, cardiac and obstetric histories, pregnancy management, and pregnancy outcomes was abstracted, and descriptive statistics were generated using STATA.

Results

There were 202 women with a total of 258 pregnancies included in the sample. The mean age at delivery was 29 years ± 6.3. 50.5% of women had CHD, 13.4% had cardiomyopathy, 2.0% had coronary disease, 5.0% had aortopathy, 4.5% had prosthetic valves, 8.4% had a history of sustained arrhythmia, and 2.0% had a history of endocarditis. 13.9% of women had a history of symptomatic heart failure, 2.0% had a history of MI, and 11.9% had chronic hypertension prior to pregnancy in addition to their primary cardiac diagnosis. Only 56.2% of women were seen by a cardiologist in the two years prior to pregnancy. In women with CHD, this number was 68.1%. Of the 192 pregnancies delivered at OHSU, 84.9% had a documented multidisciplinary delivery and contraception plan. The total rate of hypertensive disorders of pregnancy was 18.7%. The rate of CHD in the offspring of women with CHD was 7.0%. 10.9% of pregnancies had a maternal cardiac complication, including 2.7% with a sustained arrhythmia requiring treatment and 8.5% with heart failure. Only one pregnancy was complicated by thromboembolism. There were no maternal deaths, strokes, or aortic dissections.

Conclusion

In this study describing the clinical experience of Oregon's only multidisciplinary clinic for cardiac disease in pregnancy, we demonstrate that many women with heart disease do not have a pre-pregnancy cardiac assessment, despite guidelines recommending pre-conception counseling. The overall cardiac complication rate in our cohort was low, but the rate of hypertensive disorders of pregnancy was higher than expected. Our program achieved important process-related metrics for the majority of patients, including documented multidisciplinary delivery and contraception planning. Further work is needed to optimize systems of care for young women with heart disease in Oregon, with a focus on ensuring access to preconception counseling and longitudinal follow-up in women considering pregnancy.

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Pennsylvania Research Poster Finalist - Nikita Jhawar

Title

Variable potential for social media platforms in raising skin cancer awareness

Authors

Nikita Jhawar, BS - Drexel College of Medicine Jules Lipoff, MD - University of Pennsylvania (Department of Dermatology)

Introduction

Social media has played an influential role in public health endeavors by providing a space for instant communication. Smoking cessation, breast cancer awareness, and emergency reliefs campaigns are just a few of the many efforts through which social media has successfully promoted social engagement. With the ongoing advancements in technology and social media, there is a need to improve our understanding of how social media platforms can be employed in medicine to educate the public and promote discourse on public health topics. There are few studies that have explored how social media platforms can be used to spread skin cancer awareness. Our study is a preliminary effort to determine which social media platform has the greatest outreach in the context of skin cancer awareness.

Methods

Brand 24, a social media monitoring tool and database, was utilized to collect keyword data for a two-week period. Hashtags selected based on relatedness to skin cancer awareness were searched on platforms including Facebook, Twitter, and Instagram. By tracking the number of hashtag mentions for each platform, Brand 24 generated a metric called the social media reach (SMR) which represents how much social media exposure each keyword is receiving.

Results

Instagram had the greatest number of hashtag mentions and Twitter had the greatest average social media reach (SMR). The protected algorithm used by Brand 24 to calculate the SMR accounts for number of followers, subscribers, connections, and visibility percentage. As such, users with higher social media presence are able to reach a wider audience. XHNews, Inspire, and the_fitness_dietician were found to be the most prominent social media authors for spreading skin cancer awareness on social media during the time frame of our study. Lastly, single-factor ANOVA results showed a statistically significant variation in the number of mentions (p

Conclusion

As medicine continues to evolve through technology, it is important to understand how social media can be used in spreading medical awareness. Our study suggests that Twitter has greater potential social medical reach with public health awareness campaigns than Instagram and Facebook.

South Carolina Research Poster Finalist - Marissa Crum

Title

Psychological Impacts of COVID-19 on Medical Students: Results of a June 2020 Survey

Authors

Crum, Marissa A., Guo, Alyssa A., Lauren A. Fowler PhD (University of South Carolina School of Medicine – Greenville)

Introduction

Medical education has been uniquely affected by the Novel Coronavirus Disease 2019 (COVID-19), and the psychological impacts on medical students is currently unknown. Due to the need for social distancing, learning opportunities at all levels of training were disrupted and adapted. Impacts on medical students include rapid transition to remote learning, disrupted access to standardized exams, and suspension of clinical training [1-6]. These numerous last-minute adaptations undoubtedly impacted student learning and added stress. Before COVID-19, studies showed higher levels of emotional distress and depression among medical students compared to the general public [7-9]. Our study evaluates COVID-19's psychological impacts on medical students and identifies associated academic, health, and social stressors as predictors of stress and anxiety among medical students.

Methods

A nationwide, anonymous online survey was administered via email chains between June-August 2020 to first-fourth year (M1-M4) M.D. and D.O. medical students in the United States. Students from geographically diverse schools were recruited to participate by emails. Demographics, 4-point Perceived Stress Scale that measures stress, 7-point Generalized Anxiety Disorder Scale that measures anxiety, and the impacts of social, health, and academic stressors due to COVID-19 were collected. Kruskal Wallis was used to evaluate whether demographic measures show differences in respect to stress and anxiety. Relationships between demographic characteristics and stressors were assessed using Spearman’s Rho. Linear regressions were performed to assess academic, health, and social stressors that contributed most to PSS-4 and GAD-7 across year in school.

Results

Of the 852 students who participated, 66.1% experienced mild, moderate, or severe anxiety. Mean PSS-4 score was 7.25/16 (SD=3.05). M1 students had statistically lower levels of stress than M2, M3, and M4 students (p

Conclusion

Understanding how students' anxiety and stress have changed due to COVID-19 will allow educators to identify students in need and guide recommendations on the implementation of psychological interventions and support strategies. As stress levels are higher in M2, M3 and M4 students, our data indicate a need to target stress interventions towards upper-level students. In addition, students with pre-existing mental health are disproportionately impacted by COVID-19 stress. Furthermore, schools can prioritize student concerns about impacts on rotations and residency and the availability of standardized exams as these stressors were found to be strong predictors of stress and anxiety in upper year students. The present study highlights stress and anxiety measured in a small population of students at one time point during COVID-19. As the pandemic progresses, student needs may change. There is a need to continue to study medical students' mental health with broader representative samples at more medical schools to understand changes over time and to generalize the data.

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South Carolina Research Poster Finalist - Matt Lebow

Title

Development and Validation of a Risk Assessment Model for In-Hospital Mortality in Medical Patients: The Medical Inpatient Thrombosis and Hemostasis (MITH) Study

Authors

Matthew E. Lebow; Insu Koh, Ph.D., Nicholas S. Roetker, Ph.D., Katherine Wilkinson, Ph.D., Allen B. Repp, MD, Neil A. Zakai, MD

Introduction

For medical admissions, there are no validated risk assessment models (RAM) for short term mortality designed to be performed at admission with objective and easily accessible risk factors. We developed and validated an admission RAM for 10-day in-hospital mortality in medical patients.

Methods

We used a retrospective cohort at the University of Vermont Medical Center, a 540- hospital in Burlington, VT using data elements from the electronic medical record. We included all individuals 18+ old admitted to medical services from 2010-2019. The data was split into development and validation cohorts. In the development cohort, we fit multivariable logistic regression models using objective risk factors available at admission to predict 10-day in-hospital mortality. Multiple models were fit based on different variable selection algorithms including backward selection, purposeful selection, boosting, lasso, and bootstrapping. We chose a final model based on discrimination, area under the receiver operating characteristic curve (AUC), calibration (decile plot of predicted versus observed probabilities in the validation data), and clinical judgment.

Results

Overall, there were 62,467 admissions and 1,681 deaths. In the development cohort, there were 31,234 admissions and 827 deaths and in the validation cohort, 31,233 admissions, and 854 deaths. Model Development: We assessed the following potential mortality risk factors: a history of cancer in the past year, congestive heart failure (CHF), Human Immunodeficiency Virus infection (HIV), atrial fibrillation/flutter (AFIB), venous thromboembolism, coronary heart disease, peripheral artery disease, diabetes mellitus (DM), stroke, inflammatory disease, and chronic obstructive pulmonary disease (COPD); presenting laboratory values; presenting eGFR categories (including dialysis); presenting vital signs of respiratory support (low oxygenation saturation or intubation at admission); and current smoking Model Selection: Based on the

above criteria, we determined the backward selection model the most clinically appropriate, with an AUC of 0.85. The variables included were: a history of cancer, CHF, HIV infection, AFIB, DM, and COPD; presenting laboratory values of white cell count, hemoglobin, platelet count, chemistries (Na, K, HCO3), and eGFR; presenting vital signs of respiratory support, heart rate, systolic blood pressure, and temperature. Model Validation: In the validation cohort, the AUC was 0.84. With further stratification by age (age

Conclusion

Using objective and knowable admission risk factors, we developed and validated a clinical RAM able to accurately provide a quantitative estimate of 10-day in-hospital mortality. This RAM will allow providers to better inform patients and families of prognosis, tailor interventions to improve patient outcomes, or allow the timely introduction of palliative care interventions.

South Carolina Research Poster Finalist - Connor Schweitzer

Title

Assessing the relationship of ambulatory antibiotic prescribing patterns among upper respiratory tract infections, 2017-2018

Authors

Connor Schweitzer, Austin Hewitt

Introduction

Outpatient antibiotic prescribing has been a major target of stewardship programs in recent years due to its role in promoting the development and emergence of bacterial resistance as well as increased healthcare costs in the United States. Although the majority of antibiotic use occurs in ambulatory settings, most stewardship efforts have focused on inpatient care and nursing homes. The aim of this study is to investigate the relationship of ambulatory antibiotic prescribing habits among upper respiratory tract infections, including acute bronchitis, pharyngitis, acute upper respiratory infections (AURIs), and acute rhinosinusitis.

Methods

We conducted a descriptive analysis of ambulatory antibiotic prescribing patterns for 366 primary and acute care providers within a large Midwest health system (Sanford Health). Rates of inappropriate antibiotic use were evaluated for outpatient encounters in which patients were diagnosed with acute rhinosinusitis, acute bronchitis, acute pharyngitis, or an AURI from June 1, 2017 to May 31, 2018. SPSS 25.0 Complex Surveys were used to analyze the data in a manner that accounts for the complex sample survey design. Analysis was performed using summary statistics and bivariate comparisons (Chi-square tests and GLM Means). All significance tests were two-sided, P value < 0.05 for significance.

Results

A total of 66,306 patient encounters were included in this study (sinusitis [9,377], acute bronchitis [11,752], pharyngitis [22,674], and AURIs [22,503]). The average rate of inappropriate antibiotic prescribing was highest for acute bronchitis (62.3%) and lowest for sinusitis using 7-day symptom duration criteria (16.3%). Significant differences were found between the average rates of inappropriate antibiotic use across all respiratory measures with one exception for the 7-day sinusitis and AURI measures. Significant differences were noted between the mean composite rates of inappropriate use for male (35.1%) and female (30.5%) providers. No other significant differences were noted on the basis of provider type, specialty, or region.

Conclusion

Our data support the findings of previous studies that have demonstrated the widespread misuse of antibiotics for acute upper respiratory tract infections as well as the relationship between higher rates of unnecessary antibiotic use and male sex. Additionally, our results identify the possible existence of a similar pattern of inappropriate antibiotic use for sinusitis and AURIs.

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Tennessee Research Poster Finalist - Rohan R Tummala

Title

Clinical and Socioeconomic Predictors of Palliative Care Use

Authors

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Introduction

Palliative care continues to gain recognition among primary care providers, as patients suffering from chronic conditions may benefit from use of this growing service. This single-institution quality improvement study investigates the clinical characteristics and socioeconomic status (SES) of palliative care patients and identifies predictors of palliative care use.

Methods

Retrospective chart review was used to compare clinical and SES parameters for three groups of patients: (1) palliative care patients who attended at least 1 visit since the inception of the University Clinical Health Palliative Care Clinic in Memphis, TN in October 2018 (n = 61), (2) palliative care patients who did not attend any appointments (n = 19), and (3) a randomized group of age-matched primary care patients seen by one provider from May 2018 to May 2019 (n = 36). A Poisson regression model with backward conditional variable selection was used to determine predictors of palliative care use.

Results

Patients across the three care groups did not differ in demographic parameters. Compared to palliative care-referred non-users and primary care patients, palliative care patients tended to have lower health risk ($p < 0.001$). Palliative care patients did not differ from primary care patients in SES but did differ in comorbidity distribution, having a higher prevalence of cancer ($\chi^2 = 14.648$, $df = 7$, $p = 0.041$). Chance of 10-year survival did not differ across risk categories for palliative care patients but was significantly lower for very high-risk compared to moderate-risk primary care patients (30% vs. 78%, $p = 0.019$). Significant predictors of palliative care use

and their corresponding incidence rate ratios (IRR) were hospital referral (IRR = 1.471; p = 0.039), higher number of prescribed medications (IRR = 1.045; p = 0.003), lower Charlson Comorbidity Index (IRR = 0.907; p = 0.003), and lower systolic blood pressure (IRR = 0.989; p = 0.004).

Conclusion

Patients who meet multiple prediction criteria for high utilization of palliative care and who are expected to benefit from this service may experience greater clinical improvement from earlier referral to palliative care.

Texas Research Poster Finalist - Muhammad Abu-Rmaileh

Title

Characterization of Tumor-Infiltrating Lymphocytes (TILs) in Response to Combination of a Vaccine with Standard of Care in Breast Cancer Patients.

Authors

Muhammad Abu-Rmaileh, Fariba Jousheghany, Soheila Korourian, Eric R. Siegel, J. Thaddeus Beck, Laura F. Hutchins, Issam Makhoul, Behjatolah Monzavi-Karbassi

Introduction

We developed a carbohydrate mimetic-peptide vaccine termed P10s-PADRE that targets tumor-associated carbohydrate antigens (TACA) on tumor cell surface. We have shown that immunization of breast-cancer (BC) patients with P10s-PADRE induces cellular immune responses in peripheral blood. This study was performed to evaluate the effect of treatment on tumor-infiltrating lymphocytes (TILs).

Methods

25 ER-positive BC subjects were treated in a single-arm multi-site Phase Ib clinical trial. Patients were organized into 5 different vaccine schedules to elicit an immune response in combination with neo-adjuvant chemotherapy. The primary immunogenicity endpoint was presence and frequency of various immune cells within the tissue. Monoclonal antibodies against CD3, NCAM, FoxP3, CD68, and PD-L1 were used to determine percentage of T-cells, Natural Killer (NK) cells, regulatory T cells (Tregs), and macrophages within the tumor and stroma in specimens taken at diagnosis and later at surgery.

Results

The efficacy endpoint was pathologic complete response (pCR). Tumor size was measured before and after treatment. Antibody response was higher in a schedule where 3 weekly immunizations preceded the first dose of chemotherapy. Across all schedules, a significant increase in CD3, CD68, and NCAM expression was observed. Treated subjects demonstrated a significant reduction in the size of their primary tumor, and 3 subjects achieved pCR.

Conclusion

Combination of P10s-PADRE with neo-adjuvant chemotherapy shows overall tumor reduction and pathologic response in breast cancer patients associated with an increase in TILs. Detection of TILs in tumor microenvironment offers a possible mechanism for vaccine efficacy.

West Virginia Research Poster Finalist - Danielle Decicco

Title

Hospital-Wide Intervention in Billing and Coding to Accurately Capture Complexity of Care at a Major Academic Referral Center

Authors

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Introduction

Billing and coding is an essential yet complex topic. Upcoding is a detriment to healthcare, but downcoding within non-profit institutions providing complex care can account for significant revenue losses impacting the amount and quality of care they can provide. In inpatient medicine, the medical note is the primary way to assess the complexity of care. Inpatient encounters range from level I-III, with the difference between level II and III determined chiefly by complexity of the medical decision making. The wRVU for new level II vs. III encounters is 2.61 vs 3.86 and for repeat encounters is 1.39 vs. 2.0.

Methods

We analyzed data from 26 hospitalists from Jan 2018-Aug 2020. For the 2018 data, results show 51% of new encounters at level II, and 42% at level III. For repeat encounters 66% were level II, and 33% level III. Nationally the Society for Hospital Medicine notes the averages for new encounters to be 23% level II and 71% level III, and for repeat 47.1% and 49.6% level II and level III, respectively. On medical provider post-hoc analysis of these notes, 58% of level II encounters met level III criteria. This center is the highest level of care and the primary referral center for West Virginia and should be performing at minimum near the national average. From January – June 2020, we implemented a multi-faceted intervention which included a 3-prong approach: education, collaboration, and system optimization. We educated both providers and coders on basic tenets of inpatient billing and coding including time-based billing. We collaborated across providers, coders, compliance, and IT to resolve major discrepancies in code level. This included piloting certain providers to self-code their own notes with secondary coder and compliance review to remedy disagreement in assessment. Then we optimized the system via improving provider documentation and implementing a real-time comparative coding module within the EMR.

Results

These interventions have resulted in a significant change in documentation and coding practices which now more accurately reflects the complexity of care delivered. From July 2019-June 2020, the inpatient admission encounters have averaged 23% level II and 74% level III (change of level II p

Conclusion

These robust results remained consistent throughout the COVID-19 pandemic. Clearly, with this approach, an institution can markedly improve revenues by coding notes to reflect the true complexity of care delivered.

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Wyoming Research Poster Finalist - Amanda K Galambas

Title

THE PEDIATRIC "SPINE AT RISK" PROGRAM: 9-YEAR REVIEW OF A NOVEL SAFETY SCREENING TOOL AT A SINGLE INSTITUTION

Authors

Amanda K. Galambas, Walter F. Krengel III, Jennifer M. Bauer

Introduction

Spinal cord injury (SCI) under anesthesia during non-spine procedures can occur in pediatric patients with pre-existing severe spinal stenosis, instability or kyphosis. An EMR-based "Spine At Risk" (SAR) alert program was implemented at our institution in 2011 to identify these patients, trigger evaluation, and document precautions for perioperative positioning and care in an attempt to eliminate this rare, but devastating problem. This study sought to determine how and how often SAR alerts occurred, and what precautions were instituted as a result of them.

Methods

We performed a retrospective chart review of all patients with a SAR alert from 2011-19, categorized by whether the patient was flagged by the system (based on an at-risk ICD-9 or ICD-10 diagnosis) or had an alert manually entered by a provider. After a patient was flagged, they were evaluated as to whether intraoperative precautions for their spine's safety were needed and these were recorded inside their EMR chart. We recorded which precautions were recommended in each group, as well as intraoperative SCI's occurring in non-spine procedures during this period.

Results

Of the 3453 patients in the study, 1963 had a SAR alert activated due to a diagnosis and 1490 had alerts added by provider. The system was 62.5% more likely than providers to identify patients who warranted precautions (p

Conclusion

This study provides a long-term analysis of a safety program designed to prevent devastating SCI's in high-risk pediatric patients during non-spine anesthetized procedures. It was found that the system was highly effective for identifying patients who needed precautions. Cervical spine positioning precautions were the most common in both groups. No intraoperative SCI's

occurred in these patients during the study. This program may serve as a model for other pediatric institutions where patients with skeletal dysplasias and other rare and dangerous spinal conditions are frequently treated.