

Poster #1

Category: Clinical Vignette

School: American University of Integrative Sciences School of Medicine

Clerkship Director: Don Penny, MD, MSC

Presenter: Abed Dabaja

Additional Authors: Abed Dabaja; Spencer L Franchi DO; Emman Dabaja MD MPH; Ali H. Dabaja DO

Tetanus: When Clinical Suspicion is Enough

Tetanus is a severe and potentially fatal infection caused by the bacterium *Clostridium tetani*. Classifications of tetanus include generalized tetanus, neonatal tetanus, cephalic tetanus, and localized tetanus. JZ is a 18-year-old male junkyard worker who presented to the emergency department with witnessed episodic muscle contraction, apneic spells, inability to open his mouth, fever, and difficulty swallowing. He had sustained a penetrating injury to his right foot with scrap metal approximately seven days prior to symptom onset. On initial evaluation, the patient notably exhibited risus sardonicus and significant arching of his back, accompanied by approximately five minutes of intermittent apneic spells and diaphoresis, all of which resolved spontaneously. He exhibited a clean, well healed right puncture wound to the right foot. Lab work did not demonstrate leukocytosis or elevated CRP. A Mandibular x-ray was unremarkable. His Tetanus vaccination status was unknown. In conjunction with the history of recent penetrating trauma and exclusion of an alternative diagnoses, the patient was diagnosed with acute generalized tetanus. Emergency department physician initiated tetanus immunoglobulin, metronidazole, and lorazepam as needed. He was placed in the intensive care unit for close monitoring of respiratory status, given potential deterioration of diaphragmatic muscles and history of apneic periods. In the ICU, patient was evaluated daily by the neurology service, where he was eventually discharged without recurrence of spasms or any other sequelae. This case highlights the importance of clinical suspicion in the setting of unknown tetanus vaccination status and the lack of confirmatory testing.

Poster #2

Category: Clinical Vignette

School: American University of the Caribbean, School of Medicine

Clerkship Director: Michael L. Rosen, MD

Presenter: Ibrahim El-Mais

Additional Authors: Tanuj Gupta MS3, Kellen Hipp DO, Ala Shuker MD

Combination Therapy in the Management of Charles Bonnet Syndrome

Charles Bonnet Syndrome is a condition in which any decline in visual acuity leads to sensory deafferentation causing a disinhibition of visual cortical regions, which then fire spontaneously to cause visual hallucinations that often remain unresolved. A 75-year-old male with a history of macular degeneration presented to the hospital with visual hallucinations, that he described as small spiders and writings on the wall. He does recognize them as being hallucinations and that they seem to happen mostly at night with dim lights. He was diagnosed with Charles Bonnet Syndrome after ruling out all other etiologies. To provide symptom relief, the patient was reassured and advised to stay in well-lit areas and to sleep with a face mask on, in addition to initiating pharmacologic therapy. Sertraline and then risperidone alone showed no relief but the addition of 1mg of risperidone to 20mg of sertraline reduced the patient's hallucinations by more than 50%.

Charles Bonnet Syndrome is a condition that is characteristically underdiagnosed due to the variability in disease severity. This case focuses on the importance and difficulty in management and treatment for Charles Bonnet Syndrome, and to document the benefits of combination therapy in providing symptomatic relief. The importance of treatment and effectiveness of combination therapy illustrated in this case can serve as a platform to not only effectively manage existing cases of Charles Bonnet Syndrome, but also to encourage those that are undiagnosed to seek treatment and achieve some extent of symptom relief.

Poster #3

Category: Clinical Vignette

School: American University of the Caribbean, School of Medicine

Clerkship Director: Michael L. Rosen, MD

Presenter: David Freeman

Additional Authors: Jeremy Heffernan, MD and Ala Shuker, MD

A Rising Etiology for Variant Angina?

BACKGROUND:

Atypical chest pain lacking key findings of ACS, pulmonary embolism, or pericarditis do not generally result in a diagnosis of variant angina from nicotine toxicity. Known causes include cocaine use, cold exposure, tobacco use, hyperventilation, and specific medications. However, this case emphasizes its novelty and the importance of obtaining a thorough history.

CASE PRESENTATION:

A 64-year-old male presented with a sudden onset of substernal, throbbing chest pain with radiation to the neck and shoulders. Exertion, inspiration, lying supine and palpation of the sternum increased the pain; but was relieved with rest, nitrates, and leaning forward. History included COPD, hypertension, osteoarthritis, and former tobacco use. The patient was using a nicotine supplement from a convenient store for several months.

Initial 12-lead ECG showed sinus tachycardia. Repeat 12-lead ECG showed normal sinus rhythm with ST elevation <1 mm in the inferolateral and precordial leads.

Troponins were normal. D-dimer was elevated. CT scan showed no pulmonary embolism or aortic dissection. Echocardiogram showed normal ejection fraction.

Exercise stress test revealed an inferolateral wall abnormality. Cardiac catheterization showed normal coronary arteries with minimal calcification.

Nicotine and cotinine levels revealed levels three times and two hundred times the maximum limit, respectively. It was concluded the patient suffered from variant angina secondary to nicotine toxicity.

DISCUSSION:

This is a rare cause of variant angina, made notable by the elevated nicotine and cotinine levels.

CONCLUSION:

The strengths of this case report include its novelty as most physicians do not see variant angina caused solely by nicotine toxicity.

Poster #4

Category: Clinical Vignette

School: American University of the Caribbean, School of Medicine

Clerkship Director: Michael Rosen, MD

Presenter: Tanuj Gupta

Additional Authors: Yessar Takruri, Ziyad Iskenderian

Group A Streptococcus: “From Cunnilingus to Septic Shock”

Group A Streptococcus (GAS), also known as Streptococcus Pyogenes, is a Group A β -Hemolytic Aerobe commonly known to cause pharyngitis and localized skin infections. To our knowledge, this case is the first documented to describe oral intercourse (cunnilingus) as a risk factor for developing a GAS UTI with rapid progression to septic shock.

A 28-year-old female with a past medical history of asthma presented to the hospital with dysuria and fever for two days. Patient noted performing cunnilingus with her spouse who was diagnosed with an oral abscess. Vitals were 118 beats/minute, 101.2°F, and 85/36 mmHg . Blood work revealed a white blood cell count of 15,810 cells/uL and a lactic acid of 1.5. Urinalysis leukocyte esterase of 500/mcL, WBC count of 50/mcl, erythrocytes count of 250/mcL, and 5-10 squamous epithelial cells. To achieve hemodynamic stability, patient required aggressive IVF resuscitation and vasopressors. The patient was eventually discharged on amoxicillin/clavulanate for seven days.

Considering the chronological order of events, the likely mode of transmission was direct introduction of GAS and Streptococcus Viridans to the urogenital tract following cunnilingus. Moreover, the urine culture grew GAS and Streptococcus Viridans, both of which are considered part of the oropharyngeal normal flora and causative agents of oral abscesses. This case highlights the importance of educating the general population about safe sex practices and the potential risk associated with cunnilingus activity, especially with a sexual partner with an active oral infection.

Poster #5

Category: Clinical Vignette

School: ATSU - KCOM

Clerkship Director: Kent Campbell, MD

Presenter: Jason Ross

Additional Authors: Dr Sangeetha Nanthabalan

Relapsing and Remitting Fever: A Diagnostic Dilemma

Absorption fever is an increase in body temperature in response to attempts to reabsorb blood from outside the vasculature. This case documents an instance of absorption fever in a 57-year old African-American female who experienced episodic fevers despite rigorous workup and treatment for possible infectious causes.

A 57-year old nonverbal African-American female, recently discharged after a hepatic laceration and hematoma, was readmitted with episodic fever and dyspnea. On presentation her temperature was 102.2, blood pressure was 123/65, respiratory rate was 40 with SPO2 93 % on room air. Physical examination revealed slightly reduced air entry in the right lower lung zone and a soft, non-tender abdomen with improving distension. Her WBC count and urine analysis were normal and CXR demonstrated a moderate right-sided pleural effusion. She was started on broad-spectrum antibiotics and underwent an extensive work up, which failed to identify a source of infection. CT scan reconfirmed the hepatic hematoma without any suspicion of abscess. During her 14 days in hospital, the patient developed episodic high fevers despite broad-spectrum antibiotics and hemodynamic stability without end-organ damage. She was in normal health during fever-free periods.

Absorption fevers are a diagnosis of exclusion and are an important diagnostic consideration when managing a febrile patient. They are not sequelae of infection and should not be treated with antibiotics. For patients with an unexplained elevation in temperature, in the context of hemorrhage or hematoma, one should consider the diagnosis of absorption fever before defaulting to "fever of unknown origin."

ACP Michigan Chapter, Medical Student Day 2019

Poster #6

Category: CQI/EBM

School: Central Michigan University School of Medicine

Clerkship Director: Sethu Reddy, MD, FACP – Central Michigan University

Presenter: Kaitlyn Bates

Additional Authors: Rebecca Hamburger, Chin-I Cheng PhD, Jacqueline Billette, Neli Ragina, PhD

Human Papilloma Virus Educational Intervention to Improve HPV Vaccination Knowledge on College Campus

Michigan is below the national average for HPV vaccination. In efforts to rectify this disparity, 121 CMU college students agreed to partake in an educational intervention with the goal to raise awareness about the HPV vaccination and infection among college-aged students. A researcher administered a pre-survey which asked students to grade their agreement with a variety of conceptions about HPV and its consequences. Following completion of the pre-survey, students were subjected to a five-minute presentation about HPV and received information about how to receive the HPV Vaccination in their community. 8 weeks later, the researcher returned to the class to administer a post-survey that asked identical questions about HPV and the HPV vaccine. 36 students completed both the pre and post-survey. Using a McNemar's Test, the data demonstrated that the intervention improved participants' knowledge about HPV as a causative agent for genital warts ($p = .013$) and cancer ($p = .003$), as an infection spread via genital contact ($p = .001$), as an agent that cannot be cured ($p = .021$) and that an individual could be infected with HPV and be unaware ($p = .034$). Participants knowledge about HPV vaccination practices also improved ($p < .001$). Individuals continually identify lack of knowledge about HPV and the HPV vaccine as a reason to not receive it. Our data demonstrated that targeted interventions such as the one performed could increase HPV knowledge and, in the long term, vaccination rates- potentially leading to a decrease in cancers that are preventable.

Poster #7

Category: Research

School: Central Michigan University School of Medicine

Clerkship Director: Sethu Reddy, MD, FACP – Central Michigan University

Presenter: Rodrigo Blake

Additional Authors: Emily Clemens, Sara DeLap, Avi Dobrusin, Alex Gamber, Sean Kua, Marisha Schwab, Alana Siwicki, John Clements Ph.D.

Insurance Status Predicts Vaccination Waiver Rates of Kindergarten Students in Michigan Public Schools

Background: Vaccination requirements have recently become a controversial issue in the United States. Michigan permits parents of school-aged children to obtain vaccination waivers for medical, philosophical, and religious reasons. According to the CDC, in 2015, 3.6% of Michigan students had obtained such waivers.

Objectives: To examine demographic data and school vaccination records on a county-level basis to determine if any variables correlated with, or were able to predict, waiver rates among public school kindergarten students in Michigan.

Methods: Our single dependent variable was the percent of students with a philosophical or religious vaccination waiver. Our independent variables included: race, access to healthcare, income, parental education, and area of residence. Data was analyzed through linear regression analysis to elucidate any correlations between dependent and independent variables.

Results: Our results demonstrated that the most significant finding is the relationship between insurance coverage and the vaccination waivers, and through a linear regression analysis we were able to find a causative relationship between the two variables. We also found that 5.8% of public school kindergartners had vaccination waivers, which was significantly higher than the average of reported by the CDC.

Conclusion: Our analysis demonstrated that uninsured status increased vaccination waiver rates. The data analyzed also showed that there likely are more factors influencing vaccination waiver rates than those included in our study. Future studies could include other variables to find those factors that have a greater effect on increased vaccination waiver rates.

Poster #8

Category: Research

School: Central Michigan University School of Medicine

Clerkship Director: Sethu Reddy, MD, FACP – Central Michigan University

Presenter: Christal Clemens

Additional Authors: Emery Nash, Lauren Scarfe, Anna Menshikh, Mark de Caestecker

Macrophage Kinetics and Phenotype are Different in Mouse Acute Kidney Injury Models: Ischemia Reperfusion and Rhabdomyolysis

Acute Kidney Injury (AKI) is associated with increased morbidity, mortality and worse clinical outcomes. Despite much research, there is no definitive treatment. We are studying two mouse models of AKI reflecting human renal ischemia: ischemia reperfusion AKI (IR-AKI); renal toxin (myoglobin)-induced AKI: rhabdomyolysis AKI (Rhabdo-AKI). Since M1 and M2 macrophage responses regulate renal injury and repair responses after AKI, we hypothesize IR-AKI and Rhabdo-AKI will present with different macrophage responses.

We compared changes in renal macrophage numbers and phenotypes at defined time points after IR-AKI and Rhabdo-AKI in male BALB/c mice. We isolated renal macrophages 1, 3, 7, 14, and 28 days after injury using CD11b-magnetic beads, then performed qRT-PCR to evaluate mRNA levels for M1 markers (TNF α and IL1 β) and M2 markers (Arg1, MGL1 and MMP9).

Macrophage numbers showed similar kinetics after injury after both IR-AKI and Rhabdo-AKI, peaking at 7 days. In addition, there were similar expression profiles for M1 macrophage markers, TNF α and IL1 β , in both models with peak expression 1-3 days after injury. However, peak expression of the M2 markers, Arg1 and MGL1, were delayed in Rhabdo-AKI vs IR-AKI (7 days vs 3 days after injury). Contrasting with this, the M2 marker MMP9, peaked at 1 day after Rhabdo-AKI, but at 7 days after IR-AKI. These data show that while the early post-injury inflammatory renal M1 macrophage response is similar after IR-AKI and Rhabdo-AKI, the renal M2 macrophage response is delayed and shows differences in phenotype (notably lack of MMP9 mRNA expression) after Rhabdo-AKI.

Poster #9

Category: Research

School: Central Michigan University School of Medicine

Clerkship Director: Sethu Reddy, MD, FACP – Central Michigan University

Presenter: Rebecca Hamburger

Additional Authors: Kaitlyn Bates, Kirsten Weber PhD, Samuel Tacconelli, Megan Schluentz, Neli Ragina PhD

Assessment of Opioid Knowledge Based on Demographics on a College Campus

The aim of this study is to elucidate demographic associations and opioid awareness, identifying groups at risk for opioid abuse and overdose who could benefit from educational interventions. A survey assessing baseline opioid knowledge and demographic information was distributed in a campus wide email newsletter, with 156 responses. Knowledge assessment included identifying opioids, Good Samaritan laws regarding overdose assistance, and opioid pharmacology on a scale from 1 (disagree) and 5 (agree). Participants were also asked to name the antidote for overdose. Results show a wide distribution of knowledge on opioids. Overall, 88% of participants could identify oxycontin as an opioid, only 34% and 62% could identify tramadol and hydrocodone as opioids, respectively. 64% of participants felt they were not sure if they knew or did not know how to assist during overdose. Regarding sex, males were statistically significantly ($p < 0.02$) less likely to believe opioids are addictive than females. Regarding age, traditional college students (18-22 years old) were more informed on opioids than older college students (23+).

Associations between demographics and baseline knowledge show lack of knowledge on what constitutes an opioid, as well as how to identify and treat overdose. Being able to identify is an important upstream approach to curb addiction and overdose associated with overprescribing and polypharmacy. Being able to recognize and treat overdose is a downstream, lifesaving skill in the current opioid epidemic. Knowing which groups to direct educational initiatives toward could help to reduce opioid overdose, as well as improve outcomes in the case of overdose.

Poster #10

Category: Research

School: Central Michigan University School of Medicine

Clerkship Director: Sethu Reddy, MD, FACP – Central Michigan University

Presenter: Sean McBrayer

Additional Authors: Mariana Rosca

Mitochondrial Fatty Acid Oxidation is Increased in the Diabetic Heart

Cardiac disease followed by heart failure is a major complication of diabetes. The heart is continuously dependent on energy in the form of ATP for both contraction and relaxation. More than 95% of the ATP is produced by cardiac mitochondria via a process called oxidative phosphorylation. During this process, mitochondria oxidize fuel substrates, such as pyruvate (originating from glucose) or fatty acids in order to phosphorylate ADP to ATP. The normal adult heart extracts more than 75% of its ATP from fatty acid oxidation. Most forms of heart failure are associated with a metabolic switch characterized by a decrease in fatty acid oxidation and an increase in glucose oxidation, which leads to energy starvation. In contrast, the diabetic heart is almost completely reliant on fatty acid oxidation for energy production. This feature is called metabolic inflexibility and is detrimental to the heart. We aim to determine if increase fatty acid oxidation is supported by an increase in specific activity of mitochondrial fatty acid oxidation enzymes. Mitochondria from diabetes induced Sprague-Dawley rats were isolated specific enzymes related to fatty acid oxidation were compared to normal rats cardiac mitochondria. We found that the specific activity of the long- and medium chain acylCoA dehydrogenases (LCAD and MCAD, respectively) and that of the hydroxyacyl-CoA dehydrogenase are increased in isolated mitochondria from the diabetic hearts. This shows one of the mechanisms of diabetic heart failure and potentially an avenue to treat it.

ACP Michigan Chapter, Medical Student Day 2019

Poster #11

Category: Research

School: Central Michigan University School of Medicine

Clerkship Director: Sethu Reddy, MD, FACP – Central Michigan University

Presenter: Michael Megaly

Additional Authors: Jay Yu, Kayla Bennett, Robert Hammond

An Evolving Epidemic: Changes in Predictors for Heroin Dependence in a Ten-Year Period

It is well-established that opioid use in the US has been increasing. In light of the ongoing opioid epidemic, the current observational study was performed to better understand how risk factors for heroin dependence have changed over time. The study utilized data from the Substance Abuse and Mental Health Services Administration's (SAMHSA) National Survey on Drug Use and Health (NSDUH) to compare correlations between self-reported heroin dependence within the past year and a variety of other risk factors. These risk factors were assessed using data from the years 2006 and 2016. The risk factors described in the study included cigarette and drug habits, mental health status, insurance status, and youth activity participation. Additional factors were analyzed and reported, but not discussed in detail. Results indicated that most of these risk factors were significantly correlated with past-year heroin dependence in 2006 and 2016, and many of the correlations have strengthened over the ten-year period, indicating likely changes in risk factors for heroin dependence. A follow-up study is needed to determine which of the changes between years are significant. Understanding how the predictors for heroin dependence have changed in a recent ten-year period will allow for better tailoring of health interventions to prevent and treat heroin and opioid dependence.

Poster #12

Category: Clinical Vignette

School: Central Michigan University School of Medicine

Clerkship Director: Sethu Reddy, MD, FACP – Central Michigan University

Presenter: Louis Saravolatz

Additional Authors: Michael Yacoub, MD, FACP, Keith Bellovich, DO, FACP

Influenza A: A Cause of Severe Rhabdomyolysis and Acute Renal Failure

Introduction: Influenza may be associated with complications including pneumonia, myositis, and rhabdomyolysis. Children and elderly patients are recognized as being susceptible to these complications. We report a case of rhabdomyolysis leading to acute renal failure requiring hemodialysis in a young adult with influenza A.

Case: A 25-year-old male with a history of Hirschsprung's presents with one week of body aches, fever, cough, somnolence, chills, and fatigue. He required bedrest for the last week. The patient had not received an influenza vaccine and had been exposed to an influenza a week earlier. Physical examination: T= 98.1, P= 74, BP= 118/70, RR= 18. Physical examination was otherwise unremarkable.

Admission labs: CPK=1,299,000, WBC=15,520. Urinalysis showed large blood with 3 RBCs, creatinine=8.91 mg/dL, Na= 121, K= 6.3, HCO₃= 15, anion gap=26, AST=3491, ALT=666. The patient tested positive for influenza A 2009, H1N1. He received a bicarbonate drip and subsequent hemodialysis for his acute renal failure with anuria, rhabdomyolysis and hyperkalemia. After a few days, his CPK began trending down. He underwent insertion of a permacath and was discharged with plan for continued hemodialysis.

Discussion: Influenza A is a ubiquitous illness during the winter months. There are increasing numbers of reports of influenza A associated with rhabdomyolysis.

Laboratory data support that the virus can infect human cells in vitro. The consequences of muscle involvement may be much more severe than myalgias patients frequently report with influenza.

Conclusion: Influenza patients with severe muscle tenderness or kidney abnormalities should have a CPK drawn to assess for rhabdomyolysis.

Poster #13

Category: CQI/EBM

School: Central Michigan University School of Medicine

Clerkship Director: Sethu Reddy, MD, FACP – Central Michigan University

Presenter: Jaime Tan

Additional Authors: Katherine Antillano, Dalia Khader, Logan Steffke, Ereny Demian, Robert Hammond, Raju Chowdhary, Sethu Reddy, Jyotsna Pandey

Developing an Otago-Based Exercise Program to Reduce the Risk of Falls in the Older Adult Population of Central Michigan

The healthcare-related costs associated to fall injuries surpassed \$50 billion in 2015. With the older adult population expected to double by 2050, this cost is expected to multiply accordingly. In an effort to manage this issue, we have started developing a fall prevention program for the older adults in Central Michigan. We aim to provide a sustainable community program that would reduce the risk of falling and fall-related hospitalizations among the older adult population.

A baseline health assessment was performed on 97 older adults, 64 of which were women. The mean age was 77. The 16 that were classified as high-risk for falls were referred to their primary care provider. On the other hand, the 47 that were low-risk were recommended for a different program that is based off the Matter of Balance Program. The remaining 34 moderate-risk individuals was the cohort that will undergo the personalized exercise program that is derived from the US Otago Exercise Program. Further program refinements will be done upon periodic assessments. To collect quantitative data demonstrating participants' daily activity, FitBit Exercise Trackers, with FitBase software, will be utilized.

Upon the end of the first year, we are hoping to establish a free, sustainable program that will reduce the risk of falls in the older adult population of the Central Michigan Region. Outcomes could be measured by showing improved balance and mobility, and more importantly, the absence of fall-related injuries. If successful, this program could be shared with other institutions to reach more communities within Michigan and beyond.

Poster #14

Category: Clinical Vignette

School: Central Michigan University School of Medicine

Clerkship Director: Sethu Reddy, MD, FACP – Central Michigan University

Presenter: Lisa Wiesenberger

Additional Authors: Elizabeth Bankstahl, MD, FACP

Help, My Thighs Are Cramping!

Creatinine kinase (CK) is an enzyme found in skeletal muscle, cardiac muscle, and brain tissue. Elevations of CK can occur acutely when there is injury to the muscle, such as during strenuous exercise, trauma, or rhabdomyolysis. It can also occur chronically in myopathies. Elevations in CK in patients with neuromuscular warrant further workup.

Case: A 52 year old female with hypertension, obesity, and lumbar spinal stenosis presents with several months of muscle cramping and pain in the thighs and buttock that acutely worsened over a two weeks. A lumbar MRI confirmed multilevel disc herniations, spinal stenosis at T11- L4, and bilateral neural foramina narrowing from L2- L4. Lab revealed normal results for vitamin B12, TSH, FT4, ESR, CRP, magnesium, and comprehensive metabolic panel. CK was 668 U/L. The patient is not on statin or fibrate therapy. An electromyogram and nerve conduction study showed excessive myogenic motor units in the peroneus longus and medial gastrocnemius muscles, suggestive of myopathy. A muscle biopsy will be performed. If the muscle biopsy is negative, then the question remains, whether the spinal stenosis and disk herniations could be correlated with the elevated CK, perhaps by denervating muscle cells and causing atrophy.

Discussion: When evaluating patients presenting with new onset weakness, cramps, myalgias and a confirmed diagnosis of spinal stenosis, it is important to consider whether muscular pathology is present. Measurement of serum CK and diagnostic studies such as an EMG will help narrow the differential and a muscle biopsy may be necessary.

Poster #15

Category: Clinical Vignette

School: Central Michigan University School of Medicine

Clerkship Director: Sethu Reddy, MD, FACP – Central Michigan University

Presenter: RJ Williams

Additional Authors: Gerald Whitney, MD, Meredith Coyle, MD

MRSA Descending Necrotizing Mediastinitis in an Immunocompetent 21-year-old Male

Introduction: MRSA descending necrotizing mediastinitis (DNM) is a rare complication of pharyngitis descending into the mediastinum via the cervical fascial planes. Old age and chronic medical conditions are important predisposing factors; we present a case of DNM in a young immunocompetent host.

Case: A 21-year-old male without significant history had progressive dyspnea, chest pain, odynophagia, hoarseness, and fever and was treated for presumed strep throat with amoxicillin five days prior without relief. BP 137/60; HR 136; RR 60; T 38.1C. He appeared toxic with palpable lymphadenopathy. CXR showed superior mediastinal widening, pleural effusions, and left lung infiltrate. CT neck demonstrated abscesses around the hyoid bone and vocal cords. ECG was consistent with pericarditis. Labs revealed leukocytosis of 23,120; procalcitonin of 5.2, normal chemistry. Mediastinitis was suspected. He was started on ampicillin-sulbactam and vancomycin empirically. Admission blood cultures were positive for MRSA which cleared after five days on vancomycin. Following bacteremia clearance and based on serial CT Thorax, he required bilateral VATS for source control. Lack of defervescence led to pericardial window: culture negative. No vegetations seen on TTE. Patient completed 20 days of vancomycin; switched to oral TMP/SMX at discharge. Seen in clinic POD 22 and on day 29/42 of therapy appearing at baseline.

Discussion: The incidence of DNM from oropharyngeal source is <5% with a mortality rate approaching 40%. Prompt recognition and surgical management is essential. Empiric MRSA coverage is advised in young immunocompetent patients presenting with cough, odynophagia, hoarseness, and chest pain due to ca-MRSA colonization reaching 30%.

Poster #16

Category: Clinical Vignette

School: Central Michigan University School of Medicine Detroit Campus (St. John)

Clerkship Director: Sethu Reddy, MD, FACP – Central Michigan University

Presenter: Ifeanyichukwu Ogobuiro

Additional Authors: Fedreick Michael, DO

Should NHL Patients be Screened for CVID by Measuring Their Quantitative Immunoglobulin: Case Study

Background:

Common variable immunodeficiency (CVID) is characterized by defective immunoglobulin production due to impaired B cell differentiation. Majority of patients are diagnosed between the age 20 and 45. The etiology of CVID is still unknown, though it has been associated with heterogeneous genetic factors. There are variable presentations seen in CVID patients which includes recurrent infections, lung diseases, gastrointestinal diseases, autoimmune diseases, liver diseases, and risk for malignancies such as gastric cancer and Non-hodgkin lymphoma. Studies has shown that the risk of developing non-hodgkin lymphoma is 8 percent. However, the risk of developing CVID in patients with Non-hodgkin lymphoma have not been explored neither have there been an established clinical guideline for screening patients that have long history of Non-hodgkin lymphoma for CVID. This case report examines the necessity of checking quantitative immunoglobulin in patients that present with history of Non-hodgkin lymphoma.

Case Description:

This case presents a 73 year-old Caucasian male with history of Non-hodgkin lymphoma (NHL) and infrequent Upper respiratory tract infection. Due to his recurrent infection and history of NHL, quantitative immunoglobulin was measured and result showed low globulin. Common variable immunodeficiency was diagnosed.

Conclusion:

Patient with history of Non-hodgkin lymphoma might need a quantitative immunoglobulin test to screen for CVID since there is an association between CVID and NHL. This patient case presentation promotes the idea that NHL could be a risk factor for CVID. Hence, future clinical studies on quantifying the risk of developing CVID in patient with history of lymphoma should be explored. This will help improve patient care especially in the aspect of preventative medicine.

Poster #17

Category: Clinical Vignette

School: Kansas City University of Medicine and Biosciences

Clerkship Director: Jelena Arnautovic, DO Ascension Macomb Hospital

Presenter: Hassaan Siddiqui

Additional Authors: Jelena Arnautovic DO, Dustin Harmon DO, Asja Begovac MS

Familial Mediterranean Fever: An Unexpected Cause of Cardiac Tamponade

Introduction

Familial mediterranean fever (FMF) is a rare autosomal recessive disease often occurring in people of Mediterranean origin. It is characterized by recurrent episodes of fever and polyserositis, along with amyloidosis as the major long-term complication. The infrequency with which it is seen in the United States can potentially create difficulty in recognizing its rare and especially late-stage manifestations.

Case Presentation

We report on a 56 year old, Arabic female who presented with 7 days of worsening dyspnea, lightheadedness, and dizziness. Hemodynamic instability with marked hypotension, generalized pallor and distant heart sounds were noted upon initial examination. An emergent echocardiogram revealed a large circumferential pericardial effusion along with features consistent of tamponade physiology. As a result, an emergent pericardial window procedure was indicated and performed. Following the recovery process, a detailed history revealed her diagnosis of FMF in Iraq along with a history of episodic fevers abdominal pain and a renal transplant that had occurred as a result of the condition.

Discussion

Conducting a thorough history allows for diseases, especially those uncommon to the United States, to be successfully recognized and treated. As demonstrated by this case, the most critical details were learned with the assistance of a complete history that considered the patient's ethnic background and previously unknown past medical history. This led to the identification of FMF being the root cause of her symptoms, which ultimately manifested as pericardial tamponade. Thus, the patient was effectively treated in a timely manner, without any complications.

Poster #18

Category: Research

School: Medical University of the Americas

Clerkship Director: Paula Habib, MD

Presenter: Ayman Suleiman

Additional Authors:

Cardioprotective Role of Calcitonin Gene-Related Peptide Agonists and the Potential of Long-Acting Injectable Antihypertensives

Calcitonin gene-related peptide (CGRP) is a neuropeptide composed of 37-amino acids that has potent vasodilator properties. It is implicated in many protective mechanisms important for physiological and pathological processes involving the cardiovascular system. CGRP is the primary neurotransmitter of Capsaicin-sensitive sensory nerves, which helps achieve these cardioprotective properties through alterations in the synthesis and release of CGRP, interacting with pro-hypertensive systems like the RAAS system, sympathetic stimulation, and anti-hypertrophy, and anti-proliferation of vascular smooth muscle cells. It has been widely studied that a decrease in CGRP synthesis is associated with elevated blood pressures as seen in CGRP knockout mice. The benefits of modulation of CGRP is well understood, however, the development of novel therapeutic target for the clinical treatment of cardiovascular diseases such as hypertension, specifically with long-acting, injectable CGRP agonists may have benefits in patients with compliance issues or failure of conventional treatments. In its native form, circulating plasma levels in healthy individuals are low, which in part is due to the rapid metabolic clearance of plasma CGRP accounting for a half-life of 30 minutes. Also, one of the major drawbacks of CGRP is that, as a peptide, it cannot be delivered orally. However, new pharmacologically synthesized α -CGRP agonist have a half-life of 10 hours, placing it right below the half-life of conventional drugs such ACE-inhibitors. In particular, one unique aspect of this potential antihypertensive is the lack of significant side effects, aside from flushing, seen with those given IV CGRP. Novel therapeutic agents that are long-acting, injectable, with limited adverse pathological side effects could prove beneficial in the treatment of cardiovascular dysfunctions including hypertension and heart failure needs to be investigated further.

Poster #19

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member – Michigan State University
College of Human Medicine

Presenter: Michael Andrew

Additional Authors: Michael S. Lundin MD, John Cherian MD, Richa Tikaria MD

Rapid Nitrous Oxide-Induced Vitamin B-12 Deficiency with Severe Neuropsychiatric Symptoms

Nitrous oxide (N₂O) is an odorless, colorless gas known for its anxiolytic, amnestic, and analgesic properties. Vit-B12 depletion from N₂O-toxicity can occur anywhere from two days up to two months after initial use.

A 21-year-old female international university student presented to the emergency department with three days of progressive diplopia, transient vision loss, lower extremity weakness, ataxia and neuropsychiatric symptoms. For a month, patient had been using legally purchased N₂O for stress relief. The patient was not a vegan or vegetarian but had been aggressively dieting to lose weight within the past month. No history of alcohol or illicit substance abuse. Studies indicated low serum Vit-B12 (78 pg/mL, reference 211–911pg/mL), elevated Methylmalonic-acid (0.74 nmol/mL, reference ≤0.40 nmol/mL), hemoglobin-7.7g/dL, MCV-76fL and normal Folate (8.33ng/mL). Normal MRI/CT-brain and spinal cord. Patient received daily 1000 mcg intramuscular Vit-B12 repletion with partial resolution of neurologic symptoms and discharged on oral Vit-B12 supplementation for a month along with follow-up on diplopia evaluation.

Vit-B12 deficiency can mimic hematologic neoplasms, multiple sclerosis and Guillain-Barré-syndrome. Proposed mechanism of N₂O-induced Vit-B12 depletion is via oxidation. This form of Vit-B12 deficiency results in rapid depletion compared to causes such as inadequate intake, malabsorption or pernicious anemia. Malnourished or at-risk patient groups are more susceptible to Vit-B12 deficiency if exposed to N₂O-toxicity. Even after restoring Vit-B12, irreversible neurologic changes such as myelopathy may persist. N₂O is legal and inexpensive; therefore, it is crucial for healthcare-providers to maintain a high-index of suspicion, so that appropriate intervention and treatment can be done rapidly.

Poster #20

Category: Research

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member – Michigan State University
College of Human Medicine

Presenter: Colleen Howing

Additional Authors: August R. Grace, Sarah A. Pollick, Omayma O. Alshaarawy,
MBBS, Ph.D

Does Reducing Clerkship Length Impact Student-Perceived Wellness?

Purpose: Various medical schools, including Michigan State University College of Human Medicine (MSUCHM), are shortening clerkship lengths for their third-year medical students. In 2017, Alaya et al. outlined various aspects of medical student wellness. The aim of this study is to assess self-perceived wellness among medical students and determine the relationship between clerkship length and several wellness domains.

Methods: Third year students with shortened clerkships and fourth year students with longer clerkships enrolled at MSUCHM in 2019 were asked via an anonymous electronic survey to reflect on various wellness indices during their first two years of medical school, as well as, during their clerkship year. These indices included, but were not limited to, sleep, physical activity, nourishment, and hobbies. A two-sample t-test was used to compare self-reported survey responses from the shortened clerkship cohort to the preceding, longer clerkship cohort.

Results: Both the students in the shortened clerkship cohort and the longer clerkship cohort reported higher perceived wellness during the first two years of medical school as compared to wellness indices during their clerkship year. However, the decrease in self-perceived wellness between these time points was not statistically different between the two cohorts.

Conclusion: For the studied outcomes, overall wellness declined as students entered their clerkship year of medical school, however, the length of the clerkships did not significantly impact the size of the decline.

ACP Michigan Chapter, Medical Student Day 2019

Poster #21

Category: CQI/EBM

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member – Michigan State University
College of Human Medicine

Presenter: Murtaza Hussain

Additional Authors: Dr. David Blumenthal, MD, Dr. Jessica Lee, DO

Heparin Induced Thrombocytopenia Quality Improvement Directed at Reduced Testing (HIT-QUIT)

Introduction: Heparin induced thrombocytopenia (HIT) is a rare but serious condition and subsequent laboratory testing with platelet factor 4 (PF4) and serotonin release assays are expensive, time consuming, and don't maintain a high specificity. Restriction of testing can be accomplished by utilizing the 4T scoring tool; used to estimate probability of clinically significant HIT. Our aim is to determine 4T scores for patients at our institution at the time they are tested for HIT as the first phase in a quality improvement project directed at ultimately reducing testing.

Methods: Retrospective data collection was done; patient charts from a 12 month period were identified based on who had a PF4 laboratory test ordered. A 4T score was calculated from each individual chart and the results were stratified into low vs moderate to high pretest probability categories (4T scores of ≤ 3 points vs 4-8 points respectively).

Results:

There were 16 charts reviewed. Accordingly, 5 charts were intermediate, while 11 charts were low probability.

Conclusions: Out of the current data pool, 11/16 or 68.75% of patients had low probability for HIT according to the 4T score. For these patients, the HIT testing was likely unnecessary as it did not help the patient in terms of management and wasn't cost effective from a hospital standpoint. Since the remaining 31.25% of patients had at least an intermediate risk of HIT based on the 4T score, the HIT testing was appropriate in these cases. Because of the substantial number of patient's tested for HIT who had a low pretest probability to have HIT, we believe it worthwhile to consider practice changes in our institution to decrease the unnecessary ordering.

Poster #22

Category: Research

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member – Michigan State University
College of Human Medicine

Presenter: Sheetal Maragiri

Additional Authors: Emily Pardington, Paulina Phomvongsa, Sabina Shamayeva,
Sheridan Reed, Abbey Mulder, Stacie VanOosterhout, Ryan D. Madder

Predictors of One-Year Mortality in Patients Selected for PCI or Medical Management by a Multidisciplinary Heart Team

Background: Although given a Class I recommendation by professional societies, clinical outcomes based on multi-disciplinary Heart Team decisions have not been studied. This analysis was performed to investigate mortality among patients selected to undergo percutaneous coronary intervention (PCI) or medical management (MM) by a Heart Team.

Methods: Clinical data on patients presented at weekly Heart Team meetings at a quaternary referral center were retrospectively obtained via chart review. The Heart Team consisted of cardiothoracic surgeons, interventional cardiologists, and non-invasive cardiologists. Patients recommended treatment with MM or PCI were included in this analysis. Multivariate logistic regression analysis identified patient characteristics independently associated with 1-year mortality.

Results: Between January 2015 and May 2017, the Heart Team evaluated 684 consecutive patients, of which 93 (13.6%) were selected for PCI and 135 (19.7%) for MM. Adequate conduits for bypass surgery were lacking in 47.3% and 63.0% of patients in PCI and MM patients, respectively. PCI and MM patients had STS risk of morbidity/mortality scores of $19.1 \pm 14.0\% / 3.6 \pm 5.6\%$ and $18.7 \pm 13.5\% / 3.3 \pm 4.8\%$, respectively. One-year mortality rates were 17.2% in PCI patients and 20.0% in MM patients. By logistic regression analysis, patient characteristics independently associated with 1-year mortality were anemia and ejection fraction in PCI patients and end-stage renal disease, inpatient status, and age in MM patients ($p < 0.05$ for all).

Conclusion: Despite multidisciplinary shared-decision making, patients selected for PCI and MM had high mortality rates. This supports the need for additional studies to guide Heart Team decisions on treatment for complex patients.

Poster #23

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member – Michigan State University
College of Human Medicine

Presenter: Mukti Patel

Additional Authors: Ayman Aouthmany, MD., Lauren Weiner, MD., Kristopher Arndt, MD., Kenneth Leung, MD., Adam Forman, MD., Vijaya Kinni, MD.

The Perplexing Tale of a Man with Many Symptoms; Diagnosing Secondary Hemophagocytic Lymphohistiocytosis

Hemophagocytic lymphohistiocytosis (HLH) is a disease characterized by uncontrolled immune system activation and cytokine production. The rarity of HLH makes its diagnosis a challenge.

A 47-year-old African American male without any significant past medical history presented with a three week history of dry cough and epigastric pain. He complained of associated fatigue, night sweats, and weight loss. On physical examination, he was tender to palpation of the epigastrium and right upper quadrant. Abdominal ultrasound revealed mild gallbladder thickening, without evidence of acute cholecystitis. Labs revealed pancytopenia, a ferritin level of 8330, elevated liver transaminase levels, elevated triglyceride levels, and panhypopituitarism. After becoming febrile and septic, the patient was transferred to the ICU, where a broad infectious workup was unremarkable. A bone marrow biopsy exhibited hypercellular bone marrow without hemophagocytosis. After exclusion of a broad spectrum of etiologies, the patient was started on etoposide per the HLH 94 treatment guidelines, despite only meeting 4 of 8 diagnostic criteria. The patient's clinical status improved significantly with chemotherapy. He was discharged with outpatient follow up for further treatment. Natural killer cell activity level was later found to be low, providing the fifth criteria for official HLH diagnosis.

This case demonstrates the diagnostic challenge of HLH. First, HLH requires a high index of suspicion, especially when presenting with nonspecific symptoms. Second, the extensive workup of numerous other plausible conditions can lead to a delay in treatment. Early recognition of HLH can lead to swift intervention to prevent fatal outcomes, as with this patient.

Poster #24

Category: Research

School: Michigan State University - College of Osteopathic Medicine

Clerkship Director: Richard Thiede, MD, ACP Member – Michigan State University
College of Osteopathic Medicine

Presenter: Umar Hasan

Additional Authors: Dahud Farhan MD

Prevention of Pressure Injuries by Ceylon Surface

Pressure injuries are defined as localized areas of tissue necrosis (tissue death) that tend to develop when soft tissue is compressed between a bony prominence and an external surface for a prolonged period of time, thus preventing blood and oxygenation from reaching the affected tissue. They remain an important challenge, because

1. Prevention is inefficient and not scalable - pressure injury prevention pathways consists of many moving parts and key stakeholders.
2. Prevention is subjective - prevention relies on visual assessment to guide prevention strategies, which by nature, is highly subjective

With the advent of modern sensors there lies an opportunity to monitor several construct items on risk assessment scales, thereby, allowing the possibility for a continuous means of monitoring risk. The Ceylon Surface, a monitoring system, is used for measuring mattress surface interface pressure, temperature, and humidity to provide a holistic pressure injury risk. Phase 1 is a Prospective and observational trial design. 5 Curiato Sensor mats will be placed underneath a patient for 18 hours/patient, for a total of 120 patients. This research will attempt to answer two questions:^[1]_[SEP]How do nurses evaluate risk assessment and incidence of PIs? What is the difference between a nurses' evaluation of risk assessment and incidence of PIs and bedding surface values collected by the Ceylon Surface? This research will further support the development of a tool that has the potential to provide objective and continuous feedback to guide clinical decisions in aims of prevention of PI.

Poster #25

Category: Clinical Vignette

School: Michigan State University - College of Osteopathic Medicine

Clerkship Director: Richard Thiede, MD, ACP Member – Michigan State University
College of Osteopathic Medicine

Presenter: Connor Kerndt

Additional Authors: Connor Kerndt MS3; Hayk Papukhyan MD; Gurinder Gakhal MD;
Prashant Patel MD

Mixed Histiocytosis Manifesting as Suprasellar Mass with Aortic Involvement

Introduction:

Histiocytoses are a group heterogeneous diseases of unknown cause affecting myeloid progenitor cells. Erdheim-Chester disease (ECD) is a subclassification of Non-Langerhan cell Histiocytosis (LCH). ECD has characteristic lesions of the skeletal, cardiac, and vascular systems. There are many instances when LCH and ECD occurs concurrently, called mixed Histiocytosis. Fewer than 500 cases of ECD have been reported and even fewer of mixed histiocytosis.

Case:

42 year old caucasian female presented after a syncopal event, status post tenosynovitis release surgery. Patient presented with pallor and hypotension upon arrival, prompting a syncope workup. Patient admitted long standing history of claudication, fever, and weight loss.

Labs yielded a WBC of 10.5 ESR of 67, and CRP of 2.3. Initial CTA to rule out PE revealed inflammation of the aorta and left subclavian vessel with mural thickening of descending aortic arc. CTA also showed stenosis of the celiac, superior mesenteric, and renal arteries, suspicious of Takayasu arteritis. Subsequent CT and MRI exhibited a suprasellar mass which was later resected and biopsied diagnosed as BRAF positive Langerhans Cell Histiocytosis, staining positive for CD1a, S-100, Langerin, CD68 and CD168.

Discussion:

The BRAFv600e gene mutation is implicated in both LCH and ECD, suggesting a common origin. After discovery of the BRAF mutation on both LCH and ECD, a study reported significant co-occurrence between the two, including 19% of the largest ECD cohort. Recognizing LCH, ECD, and mixed histiocytosis is imperative as treatment regiments regimens differ. Thus, actively considering mixed histiocytoses is important in the setting of LCH diagnosis.

Poster #26

Category: Research

School: Oakland University William Beaumont School of Medicine

Clerkship Director: Lynda Misra, DO, FACP – Oakland University William Beaumont School of Medicine

Presenter: Chris Cooper

Additional Authors: Lisa McKay-Chiasson, MPH, Trisha Zizumbo, MSA, Sarah Lerchenfeldt, Pharm.D.

A Survey of Barriers Between Prescribers and the Michigan Automated Prescription System

Opioid abuse is a serious public health issue and has thrust our country into an opioid overdose epidemic. It is imperative to improve opioid prescribing practices that reduce exposure to opioids, prevent abuse, and stop addiction. The Michigan Automated Prescription System (MAPS) allows prescribers to track controlled substance utilization in an effort to combat rising overdose deaths. While MAPS was developed, in part, to improve responsible prescribing habits, it has been widely underused by prescribers. Oakland University William Beaumont School of Medicine partnered with the Oakland County Health Division (OCHD) and the Oakland County Prescription Drug Abuse Partnership (OCPDAP) with the overall goal of identifying specific barriers to MAPS utilization by prescribers. An electronic survey was created in Qualtrics® and emailed to prescribers utilizing pre-existing databases throughout Michigan. All prescribers with a DEA number were eligible to participate. The survey assessed patterns and barriers to use as well as prescriber knowledge of MAPS. Utilizing descriptive statistics, T-Tests, and the Pearson's Chi-Square Test, it was found that a lack of integration with the electronic health record was a significantly more challenging barrier to using MAPS when compared to the other barriers considered in the survey. With a greater understanding of MAPS utilization, these results will guide OCHD and OCPDAP in the development of toolkits and training programs that can be used to teach prescribers how to more effectively use MAPS. Ultimately, the survey will serve as groundwork for future improvement of MAPS and prescription monitoring in Michigan.

Poster #27

Category: Research

School: Oakland University William Beaumont School of Medicine

Clerkship Director: Lynda Misra, DO, FACP – Oakland University William Beaumont School of Medicine

Presenter: Kanav Gupta

Additional Authors: Alexandra Halalau M.D. F.A.C.P., Travis Tagami D.O., Emily Langnas M.D., Zahra Khaled MBBS

Assessment of Guideline Recommended Anti-Coagulation Rates for Atrial Fibrillation in an Outpatient Resident Clinic

Introduction: Atrial fibrillation is one of the most common arrhythmias and can increase patients' risk for embolic stroke. Current guidelines recommend utilizing the CHADS₂VASc risk score to stratify patients based on their prior cardiovascular history and determine their annual stroke risk. If this value is greater than or equal to 2 then anticoagulation is recommended. The main objective is to assess the anticoagulation rates in patients with atrial fibrillation in the Beaumont Outpatient Internal Medicine Resident Clinic.

Methods: In this retrospective study, all patients >18 years of age who had at least one encounter in the resident clinic over a five year period (Jan.2014 - Dec.2018) with the diagnosis of atrial fibrillation and not on anticoagulation had their CHADS₂VASc score calculated.

Results: 10,486 patients had an encounter in the clinics during our study period. 688 (6.6%) of our study population had a diagnosis of atrial fibrillation, of which 361 (52.5%) were not on anticoagulation. The results indicate that 290 out of 361 eligible patients, or roughly 80.3%, have a CHADS₂VASc score of 2 or greater.

Conclusion: Evidently, a significant portion of patients in the Beaumont Resident Clinic with a diagnosis of atrial fibrillation who are not on anticoagulation may qualify for it. This is much higher than the nationwide estimate of approximately 50% of patients who require anticoagulation and are not prescribed it. Using this data, we implemented an intervention to address this issue in our clinic.

ACP Michigan Chapter, Medical Student Day 2019

Poster #28

Category: Research

School: Oakland University William Beaumont School of Medicine

Clerkship Director: Lynda Misra, DO, FACP – Oakland University William Beaumont School of Medicine

Presenter: Matthew Lipphardt

Additional Authors: Richard Easton, MD and Cecile Pestano, RN, BSN, CCRP

SPECT/CT in Patients with Pseudoarthrosis: A Comparative Analysis of Pre-Operative Imaging and Intraoperative Findings

INTRODUCTION:

Spinal Fusion is a procedure for many conditions of the vertebral column. Failed Back Surgery Syndrome (FBSS) is a complication where patients have residual pain often due to a condition called pseudoarthrosis. Many patients have a treatable cause of FBSS, but they are underdiagnosed due to imaging limitations.

Plain X-rays have a diagnostic rate of 20% and CT scans have a rate of 40-50%. A new modality, SPECT/CT, is known to be extremely sensitive to Pseudoarthrosis, but not very specific.

The purpose of this study is to correlate the findings of SPECT/CT imaging with direct visualization of intraoperative findings.

METHODS:

We performed a retrospective study of 164 patients who underwent revision spinal surgery from Jan 2015 to Dec 2015. Patients who did not have SPECT/CT done within one year of surgery were excluded. SPECT/CT results and operative notes were examined and compared.

RESULTS:

Of the 164 patients, 60 patients had revision surgery and had SPECT/CT scan done before the procedure. The radiologist reported an incidence of 58.3% for pseudoarthrosis and intraoperatively we found an incidence of 53.3%. Those with positive SPECT/CT scans but no intraoperative presence of pseudoarthrosis had an incidence of 5%.

CONCLUSION:

SPECT/CT closely agrees with intraoperative findings of Pseudoarthrosis and has a higher sensitivity for pseudoarthrosis. We therefore recommend that SPECT/CT be utilized in patients with persistent chronic pain to help clinicians establish the best diagnosis and treatment options. This will prevent patients from being falsely labelled as FBSS and having no options for chronic pain.

Poster #29

Category: Clinical Vignette

School: Oakland University William Beaumont School of Medicine

Clerkship Director: Lynda Misra, DO, FACP – Oakland University William Beaumont School of Medicine

Presenter: Quoc-Tuan Ngo

Additional Authors: Kathleen Dass, MD

A Case of Nasal Polyp and Disease Control in a Patient with Aspirin-Exacerbated Respiratory Disease

Introduction:

Samter's triad include asthma, aspirin hypersensitivity, and nasal polyposis with abnormal eosinophil aggregation. Benralizumab is an anti-IL-5 receptor's alpha-subunit antibody recently approved for severe eosinophilic asthma. We present a case of successful management of asthma and nasal polyps with benralizumab.

Case:

A 28-year-old female presented with chronic rhinosinusitis with nasal polyps, aspirin anaphylaxis, and severe persistent asthma. In 2010, a dose of ibuprofen caused her a 3-day hospitalization for anaphylaxis. She reports anosmia and has had five sinus surgeries with polypectomy. She cannot tolerate alcohol and had a Lund-Mackay polyp score 2 in each nostril. A combination of inhaled corticosteroid, anti-cholinergic, and long-acting bronchodilator improved FEV1 from 66% to 79%. She was started on zileuton and budesonide rinses, but continued to have anosmia and severe nasal congestion. Due to refractory symptoms, additional laboratory studies were ordered. Her absolute eosinophil count was 1200 bil/L. All hypereosinophilic causes were ruled out. She was started on benralizumab 30 mg. After three doses, her asthma objectively and symptomatically improved. Incidentally, her nasal polyps decreased. She had her sixth sinus surgery with nasal polypectomy in April 2018 without recurrent symptoms. Her sense of smell returned, and asthma symptoms remained well controlled.

Conclusion:

This case demonstrates the complex management of the three aspects of Samter's triad. Traditional asthma therapy can help improve lung function, but other aspects of the triad still need further management. This case highlights the potential use of benralizumab to objectively and subjectively improve the quality of life in patients with aspirin-exacerbated respiratory disease.

Poster #30

Category: Clinical Vignette

School: Oakland University William Beaumont School of Medicine

Clerkship Director: Lynda Misra, DO, FACP – Oakland University William Beaumont School of Medicine

Presenter: Rachel Shercliffe

Additional Authors: Kathleen Dass, MD

A Case of Anaphylaxis Secondary to Reslizumab

Introduction

Reslizumab treats severe eosinophilic asthma in adults not controlled with medical therapy. This drug is a well-tolerated humanized IgG4 kappa monoclonal antibody binding to IL-5 to reduce eosinophils. We report a case of anaphylaxis secondary to reslizumab.

Case

A 71-year-old female with severe persistent corticosteroid-dependent asthma presented with reslizumab anaphylaxis. She had uncontrolled asthma despite 20-30 mg of daily prednisone, montelukast 10 mg qHS, budesonide/formoterol 160/4.5 mcg, and inhaled tiotropium 2.5 mcg. The patient had an absolute eosinophil count of 800. Reslizumab 234 mg monthly was started. After her first dose, she had increased exercise tolerance and weaned off prednisone. After her second injection, the patient failed to report transient urticaria and palpitations beginning 1 hour after reslizumab completion. She took 50 mg diphenhydramine, and symptoms resolved. With her third injection, the patient developed wheezing, urticaria, morbilliform rash, palpitations, and lip swelling 1 hour after completion. She was treated with epinephrine 0.3 mg, prednisone taper, twice daily famotidine 150 mg, and twice daily loratadine. Symptoms resolved, and reslizumab discontinued. Since then, the patient has tolerated bernalizumab with no side effects.

Discussion

Reslizumab significantly reduces eosinophils and improves lung function (AQLQ score, FEV1) thereby improving asthma control and quality of life. The most commonly reported adverse effects include headache, upper respiratory tract infections, and nasopharyngitis. Reslizumab rarely has been associated with anaphylaxis (0.3%), and it is important to establish safety and efficacy. More information is needed for monitoring morbidity and mortality, as well as consequences of withdrawal of therapy.

Poster #31

Category: Clinical Vignette

School: Oakland University William Beaumont School of Medicine

Clerkship Director: Lynda Misra, DO, FACP – Oakland University William Beaumont School of Medicine

Presenter: Amy Trang

Additional Authors: Ramy Mando MD, Alexandra Halalau MD

Dercum's Disease: A Case Report

Dercum's Syndrome is a rare condition that involves hundreds of subcutaneous lipomas distributed throughout the body. These masses are occasionally very painful with significant impact on quality of life. Currently, management and pathophysiology of this condition are not well understood and only a few cases are reported in the literature. We describe a patient who presented to the acute care clinic with this condition in an acute exacerbation of her chronic pain.

A 56-year-old female presented to urgent care for prolonged periods of decreased mobility associated with severe burning, throbbing and generalized pain. Physical examination was remarkable for 2-10 cm tender lumps located across her arms and torso. Sixty mg of intramuscular toradol with a five-day course of prednisone were administered with resolution of pain at follow-up 3 days after presentation. Abdominal computed tomography revealed numerous nodules in the subcutaneous fat of the buttocks, ventral abdominal wall and back. She underwent surgical excision of >100 lipomas in an attempt to relieve her pain. Micropathological tissue examination revealed findings consistent with angiolipomas.

Our patient was diagnosed with Dercum's disease, which is characterized by painful subcutaneous lipomas, often associated with obesity, metabolic complications, and gastrointestinal issues (fatty liver and irritable bowel syndrome). It is important to recognize available medical modalities for pain management as surgery is not curative or without risk.

Poster #32

Category: Clinical Vignette

School: Oakland University William Beaumont School of Medicine

Clerkship Director: Lynda Misra, DO, FACP – Oakland University William Beaumont School of Medicine

Presenter: Leo Viray

Additional Authors: Kathleen Dass, M.D.

A Case of Severe Solar Urticaria Successfully Treated with Omalizumab

Introduction:

Solar urticaria is a rare IgE-mediated physical urticaria causing patients to develop transient pruritic wheals secondary to sunlight exposure. We present a case of severe solar urticaria successfully treated with omalizumab.

Case:

A 32-year-old female presented to clinic seeking a second opinion for pruritic rash occurring within minutes of sun exposure. Her solar urticaria began 2 years ago and had progressively worsened in severity. Lesions resolved five hours after initial exposure and continued to occur despite treatment with four H1 anti-histamines, montelukast, and dapsons. She described her lesions as pruritic with a burning sensation. When most severe, her urticaria was associated with edema of her face and both hands. Symptoms occurred perennially with even low sunlight exposure. Diagnostic testing revealed urticaria developing at 320 nm. The decision was made to start treatment with subcutaneous omalizumab 300 mg q4 weeks. After her first dose, her sunlight tolerance increased to 5 hours. After her second dose, all urticarial lesions resolved. She has successfully been weaned off all oral medications and remains well controlled on omalizumab.

Discussion:

Diagnosing solar urticaria requires a thorough patient history and physical; however, photo-testing, a procedure exposing the patient's skin with varying wavelengths of light to induce urticaria, can be utilized for confirmation. Literature review shows varying success with different therapeutic agents ranging from anti-histamines to anti-IgE. This case demonstrates the effectiveness of omalizumab in treating refractory solar urticaria.

Poster #33

Category: Clinical Vignette

School: Oakland University William Beaumont School of Medicine

Clerkship Director: Lynda Misra, DO, FACP – Oakland University William Beaumont School of Medicine

Presenter: Danielle Yee

Additional Authors: Jeff Globerson, DO, Stephen Olsen, MD, Brett Bender, DO

Punked By the Punctum: A Case of Domestically Acquired Cutaneous Myiasis

Cutaneous myiasis is the infestation of human skin with dipterous larvae. It is endemic to tropical and subtropical areas and not common in the USA. We present the case of a Michigan woman who acquired furuncular cutaneous myiasis without travel history to a tropical or subtropical locale.

A seventy-two-year-old female presented with a burning, pruritic, migratory skin lesion on her left arm for 1 week. She stated the lesion started as an “eraser sized, perfectly round raised bruise with a dark pepper-like bump in the center.” It spread over the week, creating 3 more identical lesions. On examination, the patient demonstrated a 1-cm firm violaceous nodule with distinct central punctum and surrounding erythema. Dermoscopic examination revealed a pulsating motion and expulsion of serosanguineous fluid from the central punctum. Gross examination of a 6mm punch biopsy uncovered a small motile gray-white larval organism. Histopathological examination revealed eosinophil-rich inflammation, fibrosis, and hemorrhage. Located within the deep dermis was a complex wedge-shaped organism with extensive internal muscle bounded by a thin cuticle bearing rows of chitinous hooklets. These findings were consistent with cutaneous myiasis. The organism was removed with the punch biopsy.

Cutaneous myiasis poses a diagnostic challenge when presenting in nonendemic areas. The patient denied traveling, but reported frequent exposure to gardens, meadows, and wetlands in Northeast Michigan. Thus, the organism was likely domestically acquired. The presentation of this case underlines the importance of a thorough history and clinical examination, including dermoscopy and biopsy, to yield an appropriate diagnosis and treatment plan.

Poster #34

Category: Research

School: Ross University School of Medicine

Clerkship Director: Benjamin Diaczok, MD, FACP

Presenter: Joshua Gleason

Additional Authors: Bill R. Christian, MS-4

Physician-Assisted Suicide: Understanding, Evaluating, and Responding to The California End of Life Opinion Act

Introduction: Physician-assisted suicide occurs when a physician facilitates a patient's death by providing the necessary means to enable the patient to perform the life-ending act. On June 9th, 2016, The California End of Life Opinion Act (EOLOA) took effect allowing patients diagnosed with terminal disease to request aid-in-dying drugs. Here, we evaluate the clinical outcome of patients initiating the EOLOA processes in a large healthcare system.

Methods: Data was derived using the California Department of Public Health electronic database from June 2016 to August 2017. Patients were categorized into three main groups; completed first oral EOLOA request, prescribed EOLOA drugs, and ingested EOLOA drugs. Categories were stratified on the basis of socioeconomic characteristics, and underlying terminal illness.

Results: Of the 379 patients initiating an inquiry, 79 (21%) died, 61 (16%) were ineligible, and 176 (46%) proceeded with their request to a physician. From the 108 patients receiving EOLOA drugs, 68 (63%) ingested them and died within a median of 9 days. The majority of patients who initiated EOLOA had terminal cancer (74%). Ninety-six (55%) patients were on palliative or hospice care at the time of inquiry. The most common reason requesting EOLOA was to mitigate long-term suffering.

Conclusions: Physicians may be confronted with a request for assistance in dying. No matter where clinicians stand ethically on the permissibility of this practice, and regardless of whether these practices are legally permitted or prohibited in a given jurisdiction, clinicians should carefully consider how they will respond to these requests.

Poster #35

Category: Clinical Vignette

School: Ross University School of Medicine

Clerkship Director: Benjamin Diaczok, MD, FACP

Presenter: Navid Khamooshi

Additional Authors: Mohamed Mandeel MD, Jacky Duong DO

Psychosis or Pheochromocytoma?

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by persistent deficits in social communication and stereotypical patterns of behavior. The prevalence of ASD has increased due to increased awareness. Despite the available knowledge regarding children with ASD, services for adults are in the early stages. Therefore, accurate diagnosis and treatment of comorbid conditions in these individuals can be challenging.

Our patient is a low functioning, autistic 33-year-old male admitted after one week of aggressive behavior, sweating, and abdominal pain. Work up revealed an incidental adrenal mass and UTI. Patient was treated with antibiotics and discharged. However, worsening symptoms resulted in recurrent admissions, diagnosis of psychosis, and administration of different antipsychotics with no improvement. During the most recent admission, the patient exhibited symptoms including profuse sweating, intermittent low grade fever, tachycardia and rigidity. A repeat CT revealed the adrenal mass increased in size. Patient was diagnosed with neuroleptic malignant syndrome (NMS) with a differential diagnosis of pheochromocytoma. Patient's symptoms were resolved after a course of dantrolene, bromocriptine and discontinuation of antipsychotics. Despite inconclusive testing for pheochromocytoma, adrenal mass was removed per mother's request.

This case illustrates the complexity in treating adults with ASD. The patient's behavior change may have been attributed to his UTI and change in environment. Thus, leading to a misdiagnosis of acute psychosis and treatment which lead to NMS. Lack of experience in treating adults with ASD is a limiting factor for physicians. Therefore, more resources should be focused on adult ASD and management.

Poster #36

Category: Clinical Vignette

School: Saba University School of Medicine

Clerkship Director: Paul Jost, MD

Presenter: Fady Banno

Additional Authors: Tori Riccelli, Paul Jost, MD

Simultaneous Parotitis and Ipsilateral Herpes Zoster Ophthalmicus: Coincidence?

A 43-year-old previously healthy man presented to the primary care clinic with concurrent ipsilateral viral parotitis and herpes zoster ophthalmicus. The patient experienced painful swelling below the right ear as well as painful vesicles on the right forehead, eyelid, and cheek in the V1 dermatomal region. There were no lesions in the oral cavity or nose. Antibody titers confirmed active varicella zoster virus (VZV) in the absence of mumps or HSV 1 and 2 and unilateral parotitis was confirmed to be nonsuppurative by the patient's primary care physician and the neurologist. Both conditions resolved within 3 weeks with appropriate treatment.

The association between shingles and parotitis is very rare. To our knowledge, there are only 2 case reports of concurrent shingles and ipsilateral parotitis in immunocompetent adults. Both cases in Japan. The first case was presented by Marshall in 1970, and more recently by Yoshida in 2013. They hypothesized that VZV, when reactivated, has the potential to travel from the trigeminal ganglia to the auriculotemporal nerve, causing inflammation in the parotid gland along with the more traditional symptoms of herpes zoster. Our case was similar to the cases above, occurring in a previously healthy, 43-year-old. We believe a more cautious approach to treatment includes the treatment of herpes zoster ophthalmicus and the parotitis as two separate entities.

The question still remains: did the parotitis cause dysregulation of the patient's immune system, resulting in reactivation of the latent virus? Or was the parotitis caused by VZV travelling to the parotid gland?

Poster #37

Category: Clinical Vignette

School: St. George's University School of Medicine

Clerkship Director: Raymond Hilu, MD, FACP

Presenter: Alexandra Dimmer

Additional Authors: Dr. Elizabeth Bankstahl

Recurrent DVT on Eliquis Therapy

Introduction:

Internists have different anticoagulant agents to consider when treating acute DVT. Previously coumadin was the only agent, but required close monitoring and recurrent DVTs occurred if the patient fell outside the therapeutic window. Newer agents eliminate this need for monitoring, and recurrent DVTs are rare. The following explores a case of recurrent DVT on Eliquis therapy.

Case Presentation:

A 70 year-old Caucasian male with history of Diabetes, DVT, and obesity, presented to the ER from outpatient ultrasound with 2 new acute DVTs in the right calf. His PCP had ordered an ultrasound to evaluate the progression of an existing DVT, following 3 months of Eliquis therapy, of which the patient stated compliance. The patient was vitally stable and had no symptoms at presentation. Initial CBC, and BMP were within normal limits. He was started on a Heparin drip, was seen inpatient by Hematology, and was discharged home on Lovenox, with instructions to follow-up outpatient for further workup and longterm anticoagulation recommendations.

Discussion:

The reported incidence of recurrent DVTs on Eliquis is low (around 2%), but internists must not forget the importance of adequate outpatient follow-up to monitor for anticoagulation failure. Ultrasound monitors DVT progression, and can identify new acute DVTs. While Eliquis does not require weight-adjusted dosing, our patient's failure combined with his BMI of 36, suggests the need for further research regarding drug dosage and efficacy in obese patients. Internists should consult Hematology for anticoagulation recommendations when patients fail anticoagulation therapy, and should involve pharmacy for dosing considerations.

Poster #38

Category: Clinical Vignette

School: St. George's University School of Medicine

Clerkship Director: Raymond Hilu, MD, FACP

Presenter: Nosson Lerner

Additional Authors:

A Rare Consequence of Coronary Artery Disease: Third Degree Atrioventricular Block in the Setting of Rapid Atrial Rate

-Title (Limited by word count)

Nosson Lerner, MS3, Saif Affas, MD., Jason Donaghue MD

St. George's University, School of Medicine

Ascension St. John hospital, Detroit, Michigan.

Introduction

Third degree heart block is a complete loss of conduction in the Atrioventricular (AV) node. It can be associated with Right Coronary Artery (RCA) occlusion. AV block (AVB) with rapid atrial rate (RAR) and narrow QRS complex has been described in approximately 20% of cases of acute RCA Myocardial Infarction (MI). According to one study, of patients with Coronary Artery Disease (CAD) without acute MI, only 2.3% of the patients had restoration of 1:1 AV conduction after revascularization, although 60% had RCA lesions. Most literature suggests that AV conduction is not reversible with revascularization in CAD patients without an acute MI.

Case presentation

A 32-year-old male with past medical history of obesity, hypertension, and diabetes presented with one day history of worsening chest pain, syncope, lightheadedness, and palpitations. On examination, patient was tachycardic. Computed tomography angiography did not reveal pulmonary embolism or an acute cardiopulmonary issue. A series of 5 Electrocardiograms within 17 minutes showed a progression from sinus rhythm, to first-degree AVB, to second-degree Mobitz-type 1, to third-degree AVB with RAR and narrow QRS complex. Troponin was normal. Patient underwent cardiac catheterization, where 99% occlusion of the RCA was stented with a drug-eluting stent. Patient had restoration of 1:1 AV conduction after revascularization.

Conclusion

It is important to keep in mind this rare consequence of CAD, as often it cannot be reversed. Fortunately, here with early intervention we demonstrate that revascularization can be considered as an option for patients with new-onset AVB, and CAD, without MI.

Poster #39

Category: Research

School: St. George's University School of Medicine

Clerkship Director: Raymond Hilu, MD, FACP

Presenter: Molly McNamee

Additional Authors: Emmanuel O. Keku, MD, MA, MSPH, FAHA

Anterior Cruciate Ligament Injuries and Associated Chronic Osteoarthritis in Adulthood

The aging demographic of the American population urges research into chronic diseases and the ways they can be prevented. Worldwide, approximately one half of all adults live with a chronic disease. Chronic diseases such as heart disease, cancer, and diabetes are among the most common, but continuing medical advancements have given people the ability to live longer lives than ever before resulting in age related chronic diseases such as chronic degenerative osteoarthritis (OA). Due to the expected foreseeable increase in prevalence of OA, correlating with an ageing population, it is important to begin thinking of preventive measures in order to decrease the burden this disease has on society. There are well documented risk factors associated with OA such as age, BMI, genetics, but this review will focus on the risk factor of traumatic joint injuries (specifically anterior cruciate ligament injuries) and its association with subsequent development of OA of the knee in adulthood. Reviewing data on the outcome of ACL reconstruction surgery show positive outcomes initially, but deteriorate at a rapid rate for long term follow up. One strong predictor of developing knee OA as an adult is acquiring an injury to that joint earlier on in life. Patients who have undergone surgical treatment for management of ACL tears are more likely to develop OA than individuals with no prior injury. Preventing OA is most likely not in the surgical intervention or the management of the injury after it has been acquired, but before the injury ever takes place.

Poster #40

Category: Clinical Vignette

School: St. George's University School of Medicine

Clerkship Director: Raymond Hilu, MD, FACP

Presenter: Heidi Stoute

Additional Authors: Duy M. Nguyen, MD, Elizabeth Bankstahl, MD, FACP, Ashish Bhargava, MD, FACP

Subacute Streptococcus agalactiae Endocarditis Causing Valvular and Extra-Valvular Cardiac Destruction

Introduction: Streptococcus agalactiae (Group B Streptococcus, GBS) is most known for causing neonatal infection, but has become an increasingly important cause of life threatening invasive infections in non-neonates. Invasive GBS in adults can present as a variety of infections including endocarditis. GBS endocarditis is associated with a high mortality rate due to its aggressive nature and propensity to form large vegetations.

Case Presentation: A 57-year-old male with no past medical history presented with chest pain and lower extremity edema for 3 weeks. The patient had a 2/6 systolic murmur at the right upper sternal border and 2+ pitting edema bilaterally. Initial labs were significant for leukocytosis, and elevated Pro-BNP and Troponin-T. Blood cultures grew Streptococcus agalactiae so Penicillin G and Gentamicin were initiated. A transesophageal echocardiogram confirmed a 22mm by 18mm irregular mass on the aortic valve. The patient underwent surgery disclosing vegetations causing near complete destruction of the aortic valve and destruction of the aorta up to the right coronary sinus, and the muscular septum of the ventricle had liquefied causing a ventricular septal defect (VSD). Following surgery, he required a temporary pacemaker and was discharged to subacute rehabilitation, but was later readmitted for a possible aorta-atrial fistula and recurrent VSD.

Discussion: This case highlights the importance of recognizing GBS as an aggressive cause of endocarditis and the need for early surgical intervention. While large vegetations and complete destruction of cardiac valves is seen in GBS endocarditis, this patient also had an uncommon presentation of extra-valvular cardiac destruction.

Poster #41

Category: Clinical Vignette

School: University of Medicine and Health Sciences

Clerkship Director: Zain Kulairi, MD, Crittenton WSU

Presenter: Mark Al-Haschemy

Additional Authors: Mulham Hamdon, Raashi Chawla, Shubhkarman Dhillon, Stephanie Tancer, Zain Kulairi MD

Vibratory Angioedema: A Rare but Preventable Cause of Angioedema

Angioedema is caused by extravasation of fluid into subcutaneous tissue. The two major types are mast-cell mediated and bradykinin mediated.

Vibratory angioedema is a condition in which vibration triggers swelling and itching of the local tissues. Although rare, this condition can be diagnosed and spare the individual from unnecessary repeat ED visits and mistreatment of the condition.

Case

72 year old gentleman with history of obstructive sleep apnea and noncompliance to his CPAP machine presented with tongue swelling and dysphagia. The symptoms are not associated with any particular food or allergic process, but seem to be related to sleep. Patient was admitted and he was treated for angioedema with corticosteroids, diphenhydramine, and famotidine. Patient had been evaluated for multiple episodes of recurrent sleep-related angioedema within the last year. No identifiable cause was found. He improved significantly after treatment and was discharged with education about compliance to his CPAP machine.

Discussion

Vibratory angioedema is a rare condition usually thought to be a diagnosis of exclusion in a clinical setting. In one study it was found that vibratory stimulus induced swelling in the two patients that had history of angioedema. All symptoms triggered by vibration resolved within 24hrs in both subjects. It was also found that there is concomitant increase in histamine level associated with the symptoms.

Because of the onset of angioedema during sleep, the patient's non-compliance to CPAP and the otherwise inconclusive angioedema work-up, we believe that his angioedema is related to his obstructive sleep apnea.

Poster #42

Category: Clinical Vignette

School: University of Medicine and Health Sciences, St. Kitts

Clerkship Director: Zain Kulairi, MD, Crittenton WSU

Presenter: Jessica Diaz Rivera

Additional Authors: Mulham Hamdon, MD and Zain Kulairi, MD

Renal Medullary Carcinoma in a Sickle Cell Trait Patient

Renal medullary carcinoma is a rare neoplasm with highly aggressive behavior that mostly affects young African American population with hemoglobinopathy, especially those with sickle cell trait. It affects male young patients more than females. The most common symptoms found at initial presentation include: hematuria, flank pain and/or weight loss.

A 21-year-old African American male who was admitted with left-sided abdominal pain associated with one episode of vomiting. The abdominal pain persisted and worsened over time. Patient was drinking plenty of fluids but not producing much urine. Denies any constitutional symptoms. Laboratory studies revealed transaminases CT abdomen with/contrast revealed scattered sub-centimeter low-attenuation lesions in the liver, multiple mildly enlarged retroperitoneal lymph nodes, pelvic lymph nodes and a few mildly enlarged lymph nodes present in the right posterior Para renal space, complex cystic lesion in the lower pole of the right kidney, left hydro-nephrosis and scattered small sclerotic lesions in the vertebral bodies and iliac bones. Hemoglobin electrophoresis showed sickle cell trait. Left inguinal lymph node, core biopsy renal medullary cancer with diffuse metastatic.

We are presenting a case of rare type of renal cancer, Renal medullary carcinoma carries poor prognosis due to its highly aggressive behavior and its resistance to treatment. No chemotherapy or immunomodulatory was established to treat it. Our patient was not diagnosed with sickle cell trait before we discovered the malignancy, but checking electrophoresis confirmed that the patient has sickle cell trait, which it is the typical association between renal cell carcinoma and sickle cell carcinoma.

Poster #43

Category: Clinical Vignette

School: University of Michigan Medical School

Clerkship Director: Cyril Grum, MD, FACP – U of M

Presenter: Christina Ceci

Additional Authors: Dr. Hari Conjeevaram

Liver Failure from Erythropoietic Protoporphyrin in the Setting of Tetralogy of Fallot

Erythropoietic Protoporphyrin (EPP) is an inherited cutaneous porphyria with transient skin symptoms often diagnosed in childhood. Chronic liver disease and liver failure is rare, but a fatal consequence of EPP that occurs in 1-4% of patients. Little is known about what predisposes specific patients to develop liver disease.

A 66-year-old female with a history of repaired Tetralogy of Fallot presented with jaundice and right upper quadrant pain and an unrevealing work-up for acute on chronic liver failure (ACLF) at another hospital. She also had a lifelong “sun allergy” that had never been explored despite extensive interface with the medical community.

Physical exam was notable for jaundice, dorsal erosions on her hands, a prominent heart murmur, hepatomegaly, and 2+ pitting edema to her knees bilaterally. Laboratory testing for etiologies of liver disease was largely negative, and CT revealed hepatic cirrhosis. Liver biopsy demonstrated cirrhosis and cholestasis with pigment deposition characteristic of EPP (‘maltose cross’). The diagnosis was confirmed with elevated total plasma protoporphyrins. As no cure exists for EPP, a temporizing liver transplant was recommended. The patient declined transplant and was discharged with home hospice where she passed away two months later.

This is the first reported case of a patient with ACLF secondary to EPP with a picture complicated by a history of Tetralogy of Fallot. Her delayed diagnosis of EPP highlighted several important issues including the importance of early diagnosis while considering alternative causes of liver failure other than congestive hepatopathy in a patient with a congenital heart defect.

Poster #44

Category: Clinical Vignette

School: University of Michigan Medical School

Clerkship Director: Cyril Grum, MD, FACP – U of M

Presenter: Noah Mathis

Additional Authors: Raymond Y. Yeow MD, Adam B. Stein MD

Takotsubo Cardiomyopathy After ECT: A “Shockinglly” Rare Complication

Stress (Takotsubo) cardiomyopathy is a rare syndrome that mimics myocardial infarction and is characterized by transient left ventricular (LV) dysfunction in the absence of angiographic obstructive coronary artery disease. Pathogenesis is not well understood, however it is suspected to be due to excess catecholamine release. Here, we present a 61 year old man with history of hypertension, obstructive sleep apnea, and depression, who was admitted for suicidal ideation. Patient previously failed pharmacotherapy with various agents and subsequently underwent electroconvulsive therapy (ECT) for further management. Shortly after ECT, patient was noted to be hypotensive to 90s/40s, endorsing significant fatigue and dyspnea but denying any chest pain. Electrocardiogram showed left anterior fascicular block and T-wave inversion in Lead III. Transthoracic echocardiogram (TTE) demonstrated new LV systolic dysfunction (EF 25%), pulmonary hypertension (RVSP 51mmHg), and thin/akinetic walls extending from the mid-ventricle to the apex. Cardiology was consulted and cardiac catheterization performed, which showed angiographically normal coronaries. Patient was started on Metoprolol Tartrate and instructed to continue his home Aspirin, Atorvastatin, and Lisinopril. Upon re-evaluation in Cardiology clinic, patient endorsed slight improvement in fatigue and dyspnea. Repeat TTE 2 weeks later demonstrated normalization of LV systolic function and regional wall motion -- supporting the diagnosis of ECT-associated Takotsubo cardiomyopathy. Presently, patient requesting to repeat ECT. Takotsubo cardiomyopathy is an exceedingly rare complication of ECT, having only been reported fewer than 20 times since the 1990s. Successful retrial of ECT after functional recovery has been reported in the setting of adrenergic blockade (eg beta-blockers).

Poster #45

Category: Clinical Vignette

School: University of Michigan Medical School

Clerkship Director: Cyril Grum, MD, FACP – U of M

Presenter: Zachary Saleh

Additional Authors: Robert Paretti, MD, Sarah Hartley, MD

Putting the Heart in a Tight Spot

Effusive-constrictive pericarditis (ECP) is a rare condition whose diagnostic work-up can pose challenges, particularly if there is no clinical suspicion for the diagnosis.

Our patient is a 62-year-old with type 2 diabetes, hypertension, and myocardial infarction 17 years prior who presented with new-onset dyspnea. He was treated for presumed pneumonia, but the dyspnea worsened, and he developed marked leg edema over the next two months. Congestive heart failure (CHF) was diagnosed and he was placed on diuretics.

He was hospitalized several times, ultimately at our institution, with severe leg edema and anasarca. A chest X-ray demonstrated bilateral pleural effusions. An echocardiogram showed normal biventricular function with a small pleural versus pericardial effusion. Attempts at diuresis yielded little response. A chest CT redemonstrated pleural effusions without evidence of pericardial effusion, and we wondered: "what is the underlying etiology of the CHF?".

Ultimately, a cardiac MRI was performed, showing a multiloculated pericardial effusion with local pericardial thickening, chamber compression concerning for tamponade physiology, and signs of constriction suggesting ECP. Pericardiectomy was deferred given its high morbidity, in hopes that he improves over time.

In conclusion, our patient was diagnosed with CHF, but had a normal echocardiogram and no response to standard therapy. A new diagnosis of CHF should prompt the question: "what is the underlying etiology?", and further investigation must be pursued. Cardiac MRI is a helpful modality and should be considered early in the course of a workup if other studies are unrevealing. ECP is rare but should not be missed.

Poster #46

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP – Wayne State University School of Medicine

Presenter: Fareeza Afzal

Additional Authors: Delisa Quayson, Dr. Mohammad Tariq-Yasin Kang

Hep B or Not Hep B, That Is the Question

Hepatitis B is a viral infection that targets hepatocytes. The main source of infection is contact with blood and fluids of an infected person. This can be anything from an open sore to a contaminated blade. With modern advancements, the progression to chronic liver disease can be prevented. It is thus imperative for all high-risk individuals to be tested as soon as possible.

A 48-year-old man presented to the emergency department with a 3-day history of diffuse abdominal pain. He also reported some abdominal distension and nausea for a few weeks prior. Basic metabolic profile was remarkable for elevated ALT and AST, elevated total bilirubin, and elevated ALP. With the clinical picture and lab values obtained, the working differential was viral hepatitis. A hepatitis panel was ordered, and results were positive for Hep B surface antigen and Hep B Core IgM. Upon further investigation, social history revealed he had 1 female sex partner in the last 3 years. He denied injection drug use or sharing needles. He goes to a barber every few weeks for a close shave and recalls a few times where he was cut by the razor. This seemingly innocent revelation revealed our source for the infection.

This case illustrates the ease with which hepatitis B can be transmitted unknowingly. Educating patients on safe practices and promoting awareness should be a primary objective, both for their health and for the health of those around them. For those after encountered infection, treatment must be emphasized.

Poster #47

Category: Research

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP – Wayne State University School of Medicine

Presenter: Zahraa Alqatan

Additional Authors: Ayaka Sugiura; Yasuo Nakai; Toshimune Kambara; Brian H. Silverstein; Eishi Asano

What Happens in the Cerebral Cortex When One Says ‘Uh’ or ‘Um’?

Previous studies have illuminated the neural basis of formation and overt production of sentences during conversation. There are common utterances, however, called “filler words” that interrupt the flow of a sentence. Filler words are typically words or sounds like ‘uh’ or ‘hm’ that signify the speaker’s hesitation and intention of finishing the sentence. We determined how the spatiotemporal dynamics of neural modulations differ between overt utterance of filler and normal phrases, by measuring event-related high-gamma activity at 70-110 Hz during extraoperative electrocorticography recordings. Three patients were presented with images of scenes and instructed to describe who was depicted in the image, what they were doing, at what time, and where. Naturally occurring filler words and normal phrases were tagged at the beginning and end of vocalization. Time-frequency spectral analysis, using a complex demodulation method, was conducted time-locked to the onsets and offsets of phrases. The data showed that filler phrases were specifically associated with high-gamma augmentation in dorsolateral prefrontal regions including the middle-frontal and inferior-frontal gyri on either hemisphere. The right lingual cortex showed high-gamma attenuation specifically during utterance of filler phrases. The precentral and superior-temporal gyri showed high-gamma augmentation commonly during utterance of filler and normal phrases. During spontaneous filler word utterances, the human brain may activate dorsolateral prefrontal regions which support the search for an optimal phrase to be verbalized next, while suppressing lower-order visual processing.

Poster #48

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP – Wayne State University School of Medicine

Presenter: Madeline Berschback

Additional Authors: Louise Welsh, Eric Ayers MD

Goldenhar Syndrome: A Case of Maternal and Patient Type 1 Diabetes Mellitus

Goldenhar syndrome (Oculo-Auriculo-Vertebral spectrum) is a rare congenital syndrome affecting 1/5600 to 1/25000 live births. Diagnosis is based on first and second branchial arch deformities including hemifacial microsomia; incomplete ear formation; spinal, ocular, and jaw deformities; and incomplete visceral organ formation. Risk is increased with pregnancy complicated by diabetes, as uncontrolled glucose impairs function and development of neural crest cells contributing to facial and cardiac malformations.

Our patient is a 22-year-old male with Goldenhar syndrome who presented for newly diagnosed type 1 diabetes mellitus. He was initiated on insulin therapy, requiring multiple follow-ups given feeding limitations and complicated social situation. His medical history includes cognitive impairment, ear canal absence with deafness, ocular malformations with vision loss, and severe retrognathia with G-tube and tracheostomy dependence. He was born between 23-25 weeks after a pregnancy complicated by uncontrolled maternal type 1 diabetes, with postnatal 9 month NICU stay complicated by intraventricular hemorrhage.

Classically, Goldenhar syndrome does not change intelligence or life span. Our patient is a unique example of intellectual disability and complicated chronic management.

Development of type 1 diabetes at age 22 further differentiates our patient from the classic presentation. Although there is an established association between Goldenhar syndrome and maternal diabetes, type 1 diabetes in a Goldenhar patient is less established. As children with chronic diseases become adults, non-pediatricians must adapt to managing congenital syndromes. Type 1 diabetes may present in this population, and thus should be considered when these patients are being worked up for adult-onset diabetes.

ACP Michigan Chapter, Medical Student Day 2019

Poster #49

Category: Research

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP – Wayne State University School of Medicine

Presenter: Nina Bihani

Additional Authors: Naomi Kis, Vini Chopra, and David Richardson

Is Burnout Just Another Way to Suffer?

Background:

Pain and suffering are universal to patients and care providers. This study investigated the relationship between measures of burnout suffering, distress and overall well-being in third year medical students. Our hypothesis was that burnout and suffering are similar constructs.

Methods:

In October 2018, 59 Wayne State University School of Medicine third-year students at Henry Ford Hospital, completed questionnaires prior to a lecture on pain and suffering. These included the Oldenburg Burnout inventory (measuring exhaustion and disengagement), The Distress Thermometer, and PRISM (a novel pictorial measure of suffering), and the Satisfaction with Life Scale. The Spearman rank correlation was used to analyze the results.

Results:

The burnout inventory demonstrated slightly higher exhaustion (20.3 +/- 3.4) and disengagement (18.2 +/- 3.7) than a nationwide AAMC survey of year 2 medical students. The average Distress Thermometer (DT) result was 4.8 +/- 2.5. There were significant correlations between Satisfaction with Life and measures of suffering: DT - .394, $p=.003$, disengagement -.510, $p=.0001$, exhaustion .328, $p=.013$, and PRISM - .341, $p=.009$. In the DT, over 30% of students found stress with finances, school, fears, nervousness, sadness, worry, appearance, fatigue, memory, and sleep. In PRISM, engulfment and partial engulfment of self by medical school was noted in 52.5% and 32.2% of students.

Conclusion:

We found that burnout and decreased life satisfaction correlate with measures of suffering. Engulfment suggests that 80% of students might be at risk for burnout. If pain is inevitable and suffering/burnout optional, healing might entail teaching students how to meet their pain with compassion.

Poster #50

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP – Wayne State University School of Medicine

Presenter: Carson Castellani

Additional Authors: Michael Nissan MS-III, Jared Tucker M.D, M.H.A.

Rounding Up the Unusual Suspects: Massive Lung Abscess in an Otherwise Healthy Patient

Lung abscess is typically a polymicrobial infection leading to liquefactive necrosis and subsequent cavitory lesion within the lung parenchyma. Such infections are predominantly caused by anaerobic and facultative anaerobic bacteria from the oral cavity. We present the case of a patient with a 10-cm pneumococcal right middle lobe lung abscess without evidence of anaerobic involvement.

A 54-year-old male without significant past medical history presented with difficulty in breathing, fever, chills, diaphoresis, nonproductive cough, and right pleuritic chest pain for three days. Chest radiograph revealed right middle lobe opacity consistent with consolidated lobar pneumonia. Streptococcus pneumoniae urine antigen was positive. A working diagnosis of community-acquired pneumonia was established, prompting empiric ceftriaxone and azithromycin therapy. After two days, the patient did not show adequate improvement for discharge. Computed tomography image of the chest revealed a right middle lobe abscess 10 cm in diameter. Therapy was changed to ampicillin-sulbactam and vancomycin followed by CT-guided percutaneous drainage with pigtail catheter. Abscess fluid culture showed no organism growth after four days. This case report serves to bolster previous case reports outlining streptococcus pneumoniae as an atypical cause of primary lung abscess. Notably, anaerobic bacteria generally thrive in culture media while streptococcus pneumoniae does not grow well in vitro and was accounted for during initial antibiotic regimen. This case serves as a reminder for clinicians to consider lung abscess after treatment failure for pneumonia, even with nondiagnostic imaging findings, unlikely patient demographic, and atypical microbial etiology.

ACP Michigan Chapter, Medical Student Day 2019

Poster #51

Category: CQI/EBM

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP – Wayne State University School of Medicine

Presenter: Irene Chen

Additional Authors: Irvin Lien

Substance Use Disorder Management Education in Undergraduate Medical Programs

Introduction: Substance use disorders (SUDs) were estimated to be prevalent in 7.2% of the United States population in 2017. Yet, most undergraduate medical programs provide little formal education regarding SUDs. The lack of exposure to SUDs can result in a physician's unpreparedness with clinical management and unfavorable attitudes towards these patients, which can significantly impact patient morbidity and mortality. In an effort to counteract the upward trend of SUDs, Wayne State University School of Medicine (WSUSOM) introduced an integrated curriculum for clerkship students to address these deficiencies.

Methods: WSUSOM students in their third-year internal medicine clerkship were asked to identify a patient with a SUD and evaluate their withdrawal risk. Afterwards, the students completed a three-question survey to assess the type of substance use disorder identified, the evidence-based scale utilized for withdrawal risk, and the overall helpfulness of the assignment.

Results: A total of 207 WSUSOM medical students submitted a survey from July to October 2018. Alcohol (39.61%), opioid (20.22%), and cocaine (14.96%) use disorders were the most common SUD seen. Students used a withdrawal risk assessment tool to identify patients at risk for withdrawal in nearly three quarters (75.11%) of patients with a SUD. Of those who did utilize a withdrawal risk scale, most students (90.9%) believed the exercise was helpful.

Discussion: The integration of a SUDs curriculum into a third-year clerkship can be effective and helpful for all medical students to feel comfortable with treating SUD in the future.

Poster #52

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP – Wayne State University School of Medicine

Presenter: Mark Cooks

Additional Authors: Elizabeth Bankstahl M.D. and Abdulla Nasser M.D.

Diabetic Striatopathy

Diabetic striatopathy is a rare condition in which diabetic patients with uncontrolled hyperglycemia display a hyperkinetic movement disorder and hyperintense signalling in the contralateral corpus striatum on MRI. Here we present a case of this condition.

Case Report:

A 61 year old female with a history of hypertension presented to the emergency department with right-sided facial droop and paresthesias, weakness, and choreiform movements following witnessed seizure-like activity. The patient underwent a CT head and CTA. Both were unremarkable. She received Keppra for seizure prophylaxis. Labs showed her blood glucose was 653, hemoglobin A1C was 13.8, urinalysis was negative for ketones, and she was diagnosed with nonketotic hyperglycemia in the setting of newly-diagnosed type 2 diabetes. The patient underwent non-contrast MRI and hyperintensities were noted in the head of the right caudate nucleus, putamen, and bilaterally in the basal ganglia. A possible mass was also noted. This, with the physical exam findings, led to the diagnosis of diabetic striatopathy with hemiballism. After euglycemia was achieved with insulin, an MRI with contrast showed resolution of the hyperintensities and ruled out the possibility of a mass.

Discussion:

The pathophysiology behind diabetic striatopathy continues to be elusive, but some postulate it is a microangiopathic cerebrovascular disorder. It is primarily a radiologic and clinical diagnosis mostly seen in T2DM patients with non-ketotic hyperglycemia. Literature review revealed incidences of this occurring in patients with hyperglycemia in the range of 340-1081. Treatment consists of restoring euglycemia, and anti-epileptics are not typically used in management.

Poster #53

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP – Wayne State University School of Medicine

Presenter: Michelle Eventov

Additional Authors: Kirstin Weider, Raef Fadel, Ahmad Omar Aljamal, Fan Chen, Mohammed Ferras Dabbagh

Neurologic Sequelae of Undiagnosed AIDS: A Case Report

Case Presentation:

A 33-year-old male experienced visual changes, left-sided tingling and weakness, nausea, and mild upper extremity tremor for 2 months, at which time he was able to perform activities of daily living. In the hospital, he demonstrated severe dysmetria, dysdiadochokinesia, slowed speech, and extreme nausea. The patient denied intravenous drug use (IVDU) or male sexual partners, but reported multiple female sexual partners.

His primary care physician ordered magnetic resonance imaging (MRI) for suspected multiple sclerosis, which showed a left cerebellar lesion with high signal intensity on T2/FLAIR. Smaller lesions with similar characteristics were present in the right thalamus, bilateral occipital lobes, right parietal lobe, and left frontal lobe. A routine human immunodeficiency virus (HIV) test was positive with CD4 = 35 cells/ μ L. Positive cerebrospinal fluid polymerase chain reaction for John Cunningham (JC) virus confirmed progressive multifocal leukoencephalopathy (PML). The patient was started on antiretroviral therapy (ART) and monitored for signs of immune reconstitution inflammatory syndrome (IRIS).

Discussion:

PML is caused by JC virus reactivation, almost exclusively in immunodeficient patients. The virus infects glial cells, causing white matter demyelination. The neurologic sequelae are thus dependent on lesion burden and location. ART has improved outcomes in HIV-associated PML, despite initial clinical deterioration due to IRIS, where CD4 counts increase and HIV viral loads decrease.

This patient was a unique case of a first-time HIV diagnosis presenting with PML. His nonspecific presentation and lack of common risk factors serve as a warning for clinicians to broaden their suspicion for HIV.

ACP Michigan Chapter, Medical Student Day 2019

Poster #54

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP – Wayne State University School of Medicine

Presenter: Madison Grasty

Additional Authors: Wesen, Cheryl MD. Rizk, Natalie, MD, PhD

Case Report: Incidental Finding of Neuroendocrine Tumor of the Appendix and Fallopian Tube Carcinoma in BRCA-1 Patient

Background:

Mutations in the BRCA-1 tumor suppressor gene render patients at an increased risk for developing breast, ovarian (including fallopian tube and primary peritoneal cancers), pancreatic, and prostate cancers. Approximately 10 % of neuroendocrine tumors may occur as part of a hereditary syndrome, such as multiple endocrine neoplasia syndromes, von Hippel-Lindau syndrome, neurofibromatosis, tuberous sclerosis and nonpolyposis colon cancer. Clinical manifestations of both BRCA mutations and neuroendocrine tumors can often go undiagnosed for a period of time given their non-specific nature.

Case:

A 49-year-old female presented for workup secondary to symptomatic fibroids. Her family history was significant for multiple family members with varying malignancies. She was subsequently worked up and found to have deleterious mutation in the BRCA-1 gene. She underwent a prophylactic total abdominal hysterectomy with bilateral salpingo-oophorectomy. Final pathology demonstrating an incidental finding of an appendiceal neuroendocrine tumor and a right serous tubal intraepithelial carcinoma was found.

Conclusion:

This case report highlights the importance in considering genetic testing in individuals with a significant family preponderance. Although there have been multiple reports of serous tubal intraepithelial carcinoma found following prophylactic TAH-BSO for known BRCA mutations, this is the first report demonstrating a concomitant neuroendocrine tumor of the appendix.

Poster #55

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP – Wayne State University School of Medicine

Presenter: Jenny Jan

Additional Authors: Dr. Stephanie L. Judd, Dr. Edi Levi

Azathioprine-Associated ALK-Negative Anaplastic Large Cell Lymphoma Presenting in a Patient with Crohn's Disease

Azathioprine-associated ALK-negative anaplastic large cell lymphoma presenting in a patient with Crohn's disease

Jenny Jan, Stephanie L. Judd MD, Edi Levi MD

Thiopurines are steroid-sparing drugs commonly used to treat inflammatory bowel disease (IBD) and have a well-known, dose-independent side effect of lymphoma. Here we present a case of ALK-negative anaplastic large cell lymphoma (ALCL) in an IBD patient on long-term azathioprine.

A 70-year-old man with long-standing quiescent Crohn's disease on azathioprine presented with an unintentional 30lb weight loss. Abdominal CT scan revealed retroperitoneal lymphadenopathy and multiple liver lesions. He developed melena soon after. Complete blood count (CBC) showed anemia and atypical lymphocytes. Endoscopic evaluation showed no active bleeding and colonic biopsies showed inactive colitis. Cells from the biopsied liver lesions stained positive for CD30 and negative for ALK, consistent with ALK-negative ALCL. The patient succumbed to the disease 1 month later.

IBD patients treated with thiopurines have a 4-to-6-fold increase in risk of lymphoma compared to the general population [1] [2]. ALCL is a peripheral T-cell, non-Hodgkin lymphoma. The ALK distinction refers to the presence or absence of a translocation involving the ALK gene. ALK-negative ALCL is more genetically heterogeneous and is associated with worse clinical outcomes compared to ALK-positive ALCL [3]. Colonic involvement of ALCL has been described in the setting of IBD and chronic immunosuppression [4] [5] [6] [7]. Despite its absence in our case, we argue that the presence of lymphadenopathy, liver lesions, and atypical lymphocytes should be enough to raise suspicion of ALCL. Thiopurine-associated ALK-negative ALCL, while rarely reported in literature, should be considered by gastroenterologists caring for similar patients given its aggressive nature and poor prognosis.

Poster #56

Category: Research

School: Wayne State University School of Medicine

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EMG Analysis of The Deltoid and Adjacent Muscles in Activity of Daily Life

Introduction: The number of patients with rotator cuff deficiency and subsequent end-stage osteoarthritis is increasing. In patients with a deficient rotator cuff, Total Shoulder Arthroplasty (TSA) shows catastrophic failure rates. Reverse shoulder arthroplasty (RTSA) uses the deltoid for shoulder motion to address these issues. Little research exists regarding deltoid muscle activity. The aim here is determining deltoid activation and further understanding shoulder kinesiology in healthy subjects.

Methods: Eight healthy individuals (n=8; 6 male, 2 female) were recruited for electromyographic (EMG) data collection from deltoid, supraspinatus, infraspinatus, subscapularis, biceps, and teres major during various motions of activities of daily living (ADLs) under 3 speeds (slow, medium, fast). Motions included drinking, backward-forward, up-down, adduction-abduction, and internal-external rotations. EMG recording and data analysis were performed using Delsys EMG acquisition and EMG_Work software respectively to determine muscle activation patterns in response to the range of motion (ROM) and angular speed during concentric-eccentric contraction. Root mean square (RMS), frequency, and power spectrum density (PSD) were recorded and muscle activation correlations were statistically analyzed using SPSS.

Results and Discussions: Analysis of healthy individuals revealed increased RMS and proportionally increased concentric muscle activity with increased motion speed (ANOVA, PostHoc, LSD $p < 0.05$). Predominated muscles associated with different ADL movements were identified (PCA, $p < 0.05$). Deltoid activity predominated in abduction and rotation. Results indicate that kinematics of shoulder and upper arm muscles can be quantified using EMG.

Conclusion: This study addressed healthy patient shoulder/ upper arm muscle activation associated with ADLs. Future study will determine patterns in TSA/ rTSA patients.

Poster #57

Category: Clinical Vignette

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Findings Zebras: Thrombotic Thrombocytopenic Purpura Masquerading Acute Stroke

Introduction: Thrombotic thrombocytopenic purpura (TTP) is a rare autoimmune disease caused by antibodies against ADAMTS13. This case report features a patient who was diagnosed with TTP after presenting with stroke like neurological features.

Case Description: A 69-yo African American woman presented with acute onset fatigue, altered mental status, slurred speech, difficulty swallowing, and left-sided hemiplegia of 1 day duration. Stat head CT was negative for hemorrhage. MRI showed multiple small acute ischemic infarcts. Initial laboratory work revealed thrombocytopenia with platelet count of 6,000/mm³, anemia with hemoglobin of 7.6 g/dl and acute renal injury.

Hemolytic work up was positive with elevated LDH, indirect hyperbilirubinemia and low haptoglobin. Peripheral smear showed schistocytes indicating TTP and ADAMS13 was <1% confirming the diagnosis of TTP. Hematology was consulted and patient was started on plasma exchange and steroids. Her altered mental status, slurring of speech and dysphagia completely resolved though she continued to have residual left sided weakness.

Discussion: TTP is a very rare life threatening disorder with an incidence of 2-10 per million per year. Initial diagnosis is difficult due to its multi-system involvement and varied presentations. There should be high clinical suspicion of TTP in the setting of an acute thrombotic event, thrombocytopenia, and microangiopathic hemolytic anemia. This case highlights the importance of obtaining basic blood work like CBC in acute neurologic changes to assess the rare causes (zebras) of stroke.

Poster #58

Category: Clinical Vignette

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The Truth Is in the Fluid

Ascites occurs secondary to accumulation of fluid within the peritoneal cavity. The most common etiologies include cirrhosis, malignancy (including peritoneal carcinomatosis), nephrotic syndrome, heart failure, infection, and protein malnutrition.

We present the case of a 52-year-old man with complaint of dyspnea on exertion. His history was significant for ESRD, recently started on hemodialysis. The patient initially presented to an outside hospital where physical exam revealed ascites. His presentation was attributed to poor renal clearance in the setting of possible cirrhosis thus his dialysis regimen was increased from three to four days weekly. Unfortunately, his symptoms persisted prompting him to seek a second opinion at our institution. Ultrasound of the liver was performed raising concern for cirrhosis with evidence of portal hypertension. The patient underwent paracentesis which revealed serum-ascites albumin gradient (SAAG) of 1.5 further suggestive of portal hypertension. Ascites protein was 3.1. Liver biopsy with transhepatic pressures was pursued and demonstrated hepatic congestion and normal portal gradient. Echocardiogram was performed to evaluate for cardiac ascites and revealed constrictive physiology with septal bounce accompanied by a small pericardial effusion. Cardiac catheterization further supported constrictive physiology. After diagnosis of constrictive pericarditis was confirmed, the patient underwent pericardiectomy. At 1-month post-op follow-up, he remained asymptomatic and showed no evidence of ascites.

This case illustrates the importance of recognizing constrictive pericarditis as a cause of ascites. Utility of ascites protein is a valuable tool in distinguishing between portal hypertension and right heart failure as the etiology of high-SAAG ascites.

Poster #59

Category: Research

School: Wayne State University School of Medicine

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Retrospective Study Examining Factors Associated with Higher Tumor Mutational Burden in Patients with Non-Small Cell Lung Cancer

Introduction: The advent of immune checkpoint inhibitors (ICI) has dramatically changed the therapeutic landscape of advanced Non-Small Cell Lung Cancer (NSCLC).

Programmed death-ligand 1 (PD-L1) and more recently, Tumor Mutational Burden (TMB), have emerged as potential predictive biomarkers of response to ICI. In this study, we investigated the association of age, gender, and tumor histology with TMB. Additionally, we examined the correlation between PD-L1 expression and TMB.

Methods: This is a retrospective study that included 5,667 patients with NSCLC. Patients were placed into two groups, high TMB (n=3,060; 53.99%) and low TMB (n=2,607; 46.00%). Additional baseline characteristics included: age, gender, tumor histology, and PD-L1 expression by 22c3 immunohistochemistry. Kruskal-Wallis tests were used for continuous variables and Chi-square or Fisher's exact tests for categorical variables.

Results: Most patients were older than 50 years of age (95%, p=0.034) with a median age of 68 years (p<0.001). Adenocarcinoma was the most frequent histology (58%, p<0.001). Male gender and squamous cell histology were more likely to be associated with high TMB (p<0.001). Interestingly, 40% of patients with high TMB had low PD-L1 and 35% had both high TMB and high PD-L1 (p=0.045).

Conclusion: High TMB was found more frequently in patients with squamous cell NSCLC and in those who were male. One-third of patients had both high TMB and high PD-L1, which may represent a subset most likely to benefit from ICI. Lastly, there was a large subset of patients with high TMB who were negative for PDL-1 (47%) and may benefit from ICI.

Poster #60

Category: Research

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Assessment and Management of Pre-Procedural Patient Anxiety According to Interventional Radiologists

INTRODUCTION: Pre-procedural anxiety remains an often overlooked phenomenon in interventional radiology and there are currently no guidelines regarding its management. Therefore, this study was performed to report current preferences for the assessment and management of pre-procedural anxiety in interventional radiology. **METHODS:** A multi-disciplinary team of interventional radiologists, diagnostic radiologists, and psychiatrists developed a 13-item survey about the importance, assessment, and management of pre-procedural anxiety. The survey was disseminated to members of the Society for Interventional Radiology from March to April 2018. **RESULTS:** From 1163 responses, pre-procedural anxiety was deemed to be at least somewhat important in clinical practice (82.6%), at least somewhat important to the patient (93.5%) and at least sometimes interfering with delivery of care (70.1%). Most respondents did not formally assess anxiety (81.9%) but discussed it if raised by the patient. Methods to reduce anxiety included patient education (79.1%), medication (68.8%), empathetic communication (56.4%), family presence (40.5%), familiarization with the facility (13.8%), traditional, complementary, or alternative medicine (2.8%), and referral to mental healthcare provider (2.8%). Most responsibility to manage pre-procedural anxiety was allocated to radiologists, nurses, and patients, followed by primary care physicians, family, and mental healthcare providers. **CONCLUSIONS:** Although most interventional radiologists do not assess pre-procedural anxiety formally, the majority are willing to discuss it with patients. Methods to reduce patient anxiety include education, medication, and empathetic communication. The radiologist, nurse, patient, and others have responsibility to manage pre-procedural patient anxiety. Further study is needed to determine whether these views cohere with those of nurses.

Poster #61

Category: Clinical Vignette

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Xanthogranulomatous Pyelonephritis: A Case Series in the Importance of Pre-Operative Suspicion

Introduction:

Xanthogranulomatous pyelonephritis (XGP) is a rare renal disorder characterized by chronic granulomatous processes with extensive destruction and inflammation of renal parenchyma commonly due to recurrent renal calculi or chronic obstruction. Although definitive diagnosis often occurs through post-operative histopathological examination, delayed suspicion and untimely intervention can lead to significant morbidity and mortality. Here we compare two cases in which pre-operative diagnosis and management were essential to patient outcomes.

Case:

Our first patient is a 38-year-old female who presented with severe flank pain, nausea and vomiting for two days. CT abdomen was consistent for pyelonephritis with hydronephrosis, fat stranding, and renal and ureteral stones. Nephrectomy was delayed due to radiologic interpretation and nephrostomy tubes were placed emergently 12 hours post-imaging due to suspicion for XGP. The patient went into septic shock and coded hours post-procedure.

Our second case involves 57-year-old male who presented with flank pain and dyspnea. CT abdomen showed bear-paw appearance with dilated calyces and staghorn calculus. Nephrostomy tubes were placed immediately and the patient was scheduled for a nephrectomy. Patient was discharged a few days post-surgery.

Discussion:

Though the prognosis of XGP is considered to be good with appropriate treatment and nephrectomy, early diagnosis and treatment is essential; these two cases demonstrate the morbidity and mortality associated with delay. Prompt imaging, urine analysis with culture, initiation of antibiotics and urologic interventions are essential for managing XGP. Although definitive diagnosis is through histopathologic biopsy, CT imaging and physician awareness help expedite early interventions and improve outcomes.

Poster #62

Category: Clinical Vignette

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Ward-Rash: Spotting Acute Generalized Exanthematous Pustulosis Masquerading as Stevens-Johnson Syndrome

Introduction:

Acute Generalized Exanthematous Pustulosis (AGEP) is a rare and potentially severe drug-induced dermatosis. The onset of AGEP is rapid, often hours to days after drug exposure. AGEP may simulate toxic epidermal necrolysis (TEN) and Stevens-Johnson syndrome (SJS), posing a diagnostic challenge.

Description:

An 80-year-old woman presented with a rash and desquamation of her skin. She was discharged four days prior for cellulitis on clindamycin and ceftriaxone. She had diffuse erythema on the trunk and extremities with studded pinpoint pustules. There was superficial sloughing of the skin mainly in the skin folds. Her lower legs revealed superficial ulcers and small tense blisters. Her labs showed leukocytosis. The patient was evaluated and admitted to the hospital with the diagnosis of Stevens-Johnson syndrome. She was started on vasopressors for hypovolemic shock. Later, diagnosis of AGEP was made clinically. The patients' lack of mucosal involvement and the timing of the drug eruption within days of starting antibiotics, favored the diagnosis. Bacterial cultures of the pustules confirmed that it was sterile.

Ceftriaxone was discontinued resulting in the resolution of the dermatosis. Treatment included systemic corticosteroids, Domeboros compresses with Triamcinolone Cream and Hydrocortisone cream.

Discussion:

AGEP should be considered in cases of acute pustular rashes. The main triggering drugs are antibiotics, primarily beta-lactams. Other medications known to trigger AGEP include antimycotics, analgesics, NSAIDs, antiarrhythmics, anticonvulsants, and antidepressants. With the frequent use of these medications it is important to keep a high clinical suspicion for diagnosing AGEP.

Poster #63

Category: Clinical Vignette

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A Case of Refeeding Syndrome Presenting as Severe Bilateral Lower Extremity Weakness

After nutritional repletion in a chronically malnourished patient, a number of symptoms can present due to fluid and electrolyte shifts. This cluster of symptoms caused by low potassium, magnesium, and phosphorus is known as refeeding syndrome.

A 54-year-old male with a history of alcohol dependence presented with signs and symptoms consistent with alcohol withdrawal. He was tachycardic and had fine hand tremors. Laboratory studies showed potassium: 4.1mMol/L, magnesium: 1.1mg/L and phosphorus: 3.3mg/L. Liver function and thyroid tests were normal. He was admitted to the medical ICU and was started on D5W-0.9%NaCl solution at 100ml/hour with folic acid, thiamine, and magnesium supplementations. As his initial withdrawal symptoms improved, he began complaining of acute bilateral lower extremity weakness and inability to walk. Repeated electrolytes reveal falling potassium, magnesium, and phosphorus levels at 3.3mMol/L, 1.2mg/L, and <1mg/L, respectively despite aggressive repletion. Subsequent electrolyte repletion took five days. His weakness completely resolved, and he was discharged home.

Chronic alcoholic patients are usually malnourished, and their intracellular electrolyte stores are often depleted in order to maintain appropriate serum levels. During hospitalization, rapid infusion of dextrose causes a drastic rise in insulin, which, in turn, drives cellular uptake of electrolytes along with the synthesis of phosphorylated intermediates. This case illustrates the importance of aggressive monitoring and repletion of electrolytes in patients at risk for refeeding syndrome. Symptoms may not become apparent until 12-to-36 hours after refeeding begins, but early recognition of this syndrome can prevent complications such as weakness, arrhythmias, respiratory failure and death.

Poster #64

Category: Clinical Vignette

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More Than Just Anemia: A Complicated Case of Myelodysplastic Syndrome

Myelodysplastic Syndrome (MDS) is a premalignancy seen in hematopoietic stem cells, characterized by pancytopenia. Although the prognosis of MDS is extremely variable, the importance of its diagnosis is underscored by the 20-25% increased risk of progression to AML. There is no clear etiology of MDS, but recent cases have suggested iatrogenic causes. Here we present a case of a 62 year old man presenting to the ER for anemia.

Our patient has a past medical history of alcohol use disorder, hypertension, and rheumatoid arthritis. He was previously worked up for anemia, and a clinical diagnosis of anemia secondary to long-term use of the immunosuppressants methotrexate and sulfazaline was made. New-onset lower extremity edema and an ulcer of the right arm at his second hospitalization raised suspicion for another underlying cause. The patient also had cyclical fevers and right ankle pain. A tibia/fibula X-Ray was positive for lytic lesions and chest X-Ray was positive for a central left upper lobe and lingula mass later confirmed by CT. Multiple myeloma or a lymphoma were considered, due to history of rheumatoid arthritis. A serum protein electrophoresis was positive for polyclonal immunoglobulins. Ultimately, bone marrow biopsy confirmed MDS EB 1 with 9-10% blasts. However, the patient's cardiac function had decreased to the point where he was no longer a candidate for chemotherapy. Although the cause of this patient's anemia was ultimately not attributed to iatrogenic causes, this is a prime example of the importance of a thorough work up of an anemic patient.

Poster #65

Category: Clinical Vignette

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A Zebra in Horse Clothing: Nonspecific Presentation of Highly Proliferative Metastatic Neuroendocrine Carcinoma

Introduction: Neuroendocrine tumors/carcinomas (NET/NEC) are orphan diseases accounting for 0.5% of all newly diagnosed malignancies. Despite its rarity, the incidence of NET has risen 6.4-fold within the last three decades with increases higher in African Americans. This trend may be secondary to improved detection with endoscopy, CT, and MRI. Additionally, NEC-associated liver metastases are typically treatment-refractory and correlate to a 5-year survival rate of 0-40%. To maximize the chance of diagnosing NEC during indolent stages, internists should be aware of its various presentations and methods of detection.

Case description: A 67-year-old African American female with multiple co-morbidities was admitted for concerns of acute watery diarrhea, decreased appetite, fatigue, and generalized weakness. Subsequent labs revealed transaminitis and acute kidney injury. Preliminary ultrasound imaging showed severe hepatomegaly and bile duct dilatation, which widened the differential to include oncogenic causes. Negative AFP reduced the probability of primary liver cancer, and CT revealed a colonic stricture with submucosal thickening, indicating a potential origin site for liver metastases. MRCP/ERCP were contraindicated due to the patient's unstable condition, so ultrasound-guided biopsy of the liver was obtained. She expired two weeks into her admission and biopsy results obtained postmortem revealed the presence of Grade III NEC cells.

Discussion: This case highlights the difficulties of identifying NET/NEC given its nonspecific symptoms further exacerbated by patient co-morbidities. With increased awareness of the diversity of the disease manifestations, healthcare professionals can maintain a higher index of suspicion which can lead to early diagnosis and reduced morbidity and mortality.

ACP Michigan Chapter, Medical Student Day 2019

Poster #66

Category: Clinical Vignette

School: Western Michigan University School of Medicine

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Incidental Finding of Plastic Bronchitis in an Asthmatic Patient with Possible ABPA

Introduction: Plastic bronchitis is a rare respiratory disease characterized by airway shaped casts or plugs, most commonly associated with congenital heart disease. It is uncommon in patients with asthma who instead may present with a mucus plug during acute exacerbation. We present a case of inflammatory casts in an asymptomatic patient with a history of asthma.

Case Description: An asymptomatic 17-year-old male with mild intermittent asthma presented for a sports physical. Decreased breath sounds, wheezing, and opacity of the left lower lobe on chest x-ray were identified. Antibiotics, bronchodilators and oral corticosteroids failed to clear the opacity. After he began expectorating mucus plugs and casts, bronchoscopy was performed for bronchial cast removal. Follow up chest CT after re-expansion of the atelectatic airway showed central bronchiectasis. Pathology reports showed Charcot-Leyden crystals and eosinophilic infiltration. IgE was mildly elevated, Aspergillus fumigatus precipitins were positive. Oral steroids, voriconazole and additional inhaled corticosteroids were prescribed for asthma and possible ABPA and the patient's symptoms resolved.

Clinical Significance: The patient's asymptomatic nature despite airway obstruction from the cast makes this a unique case of plastic bronchitis, which usually occurs in the acute setting. Although he did not fulfill all the criteria for ABPA diagnosis, the patient's clinical course, associated imaging and eosinophilic cast were strongly suggestive of ABPA.

Discussion: Early bronchoscopy should be considered for patients presenting with unexplained wheezing and atelectasis to rule out airway obstruction. The pathology report of Charcot-Leyden crystal and eosinophilic infiltrate was essential for diagnostic and management.

Poster #67

Category: Clinical Vignette

School: Western Michigan University School of Medicine

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A Unique Case of Osteomyelitis Caused by *Gardnerella vaginalis* and *Streptococcus parasanguinis* in a Post-Menopausal Woman

Introduction: Vertebral osteomyelitis is an infection of the vertebrae (and often the intervertebral disc) that can cause pain and neurologic deficits. Bacteria most frequently associated include *S. aureus* and *E. coli*. Incidence has increased due to longer life expectancy and heightened clinical awareness. It most often results from hematogenous seeding, as a complication of spinal surgery or as contiguous spread from adjacent soft tissue infection.

Case Description: A 61-year-old, post-menopausal woman had recently become sexually active after 10 years of celibacy. She presented with 2-weeks of progressive lower back pain and fever. She had a history of fibromyalgia, chronic back pain with prior L2-L3 fusion, and a recent cystitis. Magnetic resonance imaging (MRI) revealed L3-L4 discitis and osteomyelitis of L4 (and likely L3), paraspinous phlegmon with right psoas muscle abscess. Cultures from needle aspiration of abscess grew *Gardnerella vaginalis* and *Streptococcus parasanguinis*. The patient received a 6-week course of IV ceftriaxone and oral metronidazole. At present, she is significantly improved with no clinical signs of infection.

Clinical significance: This case highlights the potential for *Gardnerella* to cause infection in atypical locations and suggests that re-engagement of sexual activity can be a risk factor for spinal osteomyelitis in a post-menopausal woman.

Discussion: This patient had a rare co-infection with *G. vaginalis* and *S. parasanguinis*. Literature review identified few cases of this unusual association. These organisms are often associated with infections of the genital tract and oral cavity, respectively.