

## ACP Michigan Chapter Scientific Meeting 2021

Oral# 1

Category: Clinical Vignette

Program: Ascension St. John Hospital - Grosse Pointe

Program Director: Raymond Hilu, MD, FACP

Presenter: Sangeeta Adusumilli

Additional Authors: Sangeeta Adusumilli, MD; Aditi Singh, MD; Michael Kern, MD; Leonard B. Johnson, MD FACP

### **Atypical Presentation of Plasmablastic Lymphoma in a Patient with HIV**

**Introduction:** Plasmablastic lymphoma (PBL) is an aggressive type of Non-Hodgkin's lymphoma (NHL), predominantly occurring in immunocompromised patients such as HIV/AIDS and solid organ transplant. Extranodal presentation is frequently seen in HIV positive PBL with the most common sites of involvement being the oral cavity, gastrointestinal tract. We herein present a rare case of plasmablastic lymphoma presenting with paraplegia.

**Case:** A 40 year old African-American male with a past medical history of HIV, compliant with his antiretroviral regimen presented with a 5 day history of bilateral lower extremity weakness associated with hypoesthesia from below the umbilicus, urinary, and bowel incontinence. He also reported a painless mass associated with intermittent bloody discharge in his oral cavity which developed 2 months ago. He denied any B-symptoms. On examination, he was thin, well-appearing, had a necrotic mass in his right upper jaw, and had 0/5 strength in his lower extremities. Labs showed a normal WBC count, LDH levels, and an undetectable HIV viral load, but a CD4 count of 41. MRI-Spine showed solid-appearing homogeneously enhancing oval-shaped mass causing spinal cord compression at T6, T7, which was resected, sent for pathology, and showed findings consistent with monoclonal plasmablastic cells with EBV positive, HHV-8 negative proliferation consistent with Plasmablastic Lymphoma. Biopsy from the oral mass was consistent with Plasmablastic lymphoma. The patient was started on chemotherapy with etoposide phosphate, prednisone, vincristine sulfate, cyclophosphamide, and doxorubicin hydrochloride. CNS prophylaxis with Intrathecal MTX was administered. He is scheduled to receive 6 cycles of chemotherapy along with Bortezomib with some recovery of his leg weakness.

**Discussion:** PBL is a rare NHL seen predominantly among HIV patients with frequent oral lesions at presentation. Involvement of the spinal cord is a very rare presentation. This condition should be considered in HIV patients presenting with oral lesions

Program: Ascension St. John Hospital - Grosse Pointe

Program Director: Raymond Hilu, MD, FACP

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**Granulomatosis with Polyangiitis : A Diagnostic Challenge in the Elderly with Bilateral Lung Nodules**

Background: Granulomatosis with polyangiitis (GPA), previously known as Wegener's granulomatosis, is a rare multisystemic autoimmune necrotizing small and medium-vessel vasculitis with classical triad of the disease affect upper, lower respiratory tract and kidneys. The typical age of onset is 40-60 years. There are only a few documented cases with onset in elderly. Prompt recognition and treatment is important to reduce mortality. Early diagnosis may be difficult if another diagnosis is perceived as the more likely on presentation especially among elderly patients. We present a case of GPA with bilateral lung nodules in a 79 years old patient.

Case : A 79-year-old female with past medical history of hypertension, polymyalgia rheumatica, and degenerative joint disease presented with a cough for 6 months duration along with progressive shortness of breath . Vitals were normal. Chest examination was remarkable for basal crackles. Laboratory data including renal functions was normal except a low hemoglobin of 11.5g/dl. Chest x-ray showed bilateral lung infiltrate. Computed tomography angiography of the chest was consistent with multiple nodules and masses with cavitation. Echocardiogram was normal. Bronchoscopy with EBUS guided biopsy showed necrotic granulomatous changes consistent with GPA. P-ANCA was elevated at a titer of 1:1280. All microbiological cultures including blood cultures remained negative. Patient was started on rituximab and corticosteroids with resolution of symptoms and lung nodules.

Conclusion: This case illustrates that GPA can present as a diagnostic challenge in the elderly. Radiographic abnormalities and symptoms can be mistaken for metastases, lung abscess or septic infarcts . Induction therapy with corticosteroids combined with rituximab or cyclophosphamide has significantly decreased the mortality of patients with GPA. Prompt recognition by clinicians can prevent life-threatening complications and reduce mortality.

Program: Ascension St. John Hospital - Grosse Pointe

Program Director: Raymond Hilu, MD, FACP

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### **Cardiac Dysrhythmia From Hypermagnesemia Due to Treatment of Constipation**

Introduction: Hypermagnesemia is an under recognized cause of cardiac dysrhythmia. We present a case of junctional bradycardia due to SA node suppression from hypermagnesemia.

Case Presentation: An Elderly African American female with a history of breast cancer on anastrozole, Hypothyroidism, Chronic kidney disease, Constipation, Hypertension, Diabetes mellitus was sent to the ED by her Oncologist for bradycardia. Patient was experiencing increased weakness, and occasional orthostatic symptoms such as dizziness when standing up for the past couple of months. The physical exam was notable for bradycardia, and trace bilateral lower extremity edema. Lab work revealed acute kidney injury with a creatinine of 4.01 mg/dL and hypermagnesemia of 4.0 mEq/L. ECG showed junctional bradycardia with p waves consistently occurring after the QRS complex. Upon further questioning, the patient was taking Milk of Magnesia four to five times a day to relieve her constipation. Work up revealed hemodynamic acute tubular necrosis, resulting in acute kidney injury and hypermagnesemia. Consequently, SA node was suppressed, and the AV node was the primary pacemaker in this setting generating retrograde conduction P waves stimulating the SA node. The patient was intravenously and orally hydrated which resulted in gradual resolution of AKI and hypermagnesemia . A repeat ECG demonstrated resolution of the junctional rhythm.

Discussion: This case highlights how hypermagnesemia can lead to SA node suppression, and the importance of history taking. As an internist, it is very important to wisely choose medical management even in the setting of simplest complaints such as constipation, and how treatment plans can lead to ramifications in patients with multiple comorbidities.

Program: Ascension St. John Hospital - Grosse Pointe

Program Director: Raymond Hilu, MD, FACP

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### **Opioid-Induced Central Adrenal Insufficiency: A New Crisis That Needs Vigilant Watch**

Introduction: Opioid-induced adrenal insufficiency occurs because of the suppression of the hypothalamic-pituitary-adrenal communication, and may be challenging to diagnose. It has been reported in 9% to 29% of patients receiving long-term opiate therapy.

Case Presentation: A 36 years old African-American female with PMH of chronic back and abdominal pain since a motor vehicle accident 4 years ago, and opioid dependence for 2 years, presented with hematemesis. CT abdomen showed a perigastric mass extending or originating from the pancreas and causing pressure on the stomach wall, with intragastric bleeding confirmed by EGD. Differential Diagnosis was perigastric hematoma vs a GIST tumor. She underwent open laparotomy with excisional biopsy. We noticed that the patient's blood pressure was always borderline 90s/60s, despite hemodynamic stabilization of the bleeding. It was also noted that the patient was always weak and fatigued. Adrenal insufficiency was suspected, and early morning cortisol level was low at 3.1 mcg/dl. ACTH stimulation test was negative with a 60 minutes post stimulation cortisol of 22.3 mcg/dl. However, due to the high index of suspicion, ACTH level was obtained and was depressed at 4 pg/mL. Prolactin was elevated at 60.1 ng/mL, and TSH normal at 1.3 mcunit/mL. Patient was diagnosed with opioid induced central adrenal insufficiency, and was started on hydrocortisone. She experienced significant improvement in her symptoms, and quality of life. Diagnosing and treating her was crucial to prevent adrenal crisis during her surgery.

Discussion: Opioid dependence is a challenge facing the community in the US, with a growing number of complications. Adrenal insufficiency is one to highlight, and it puts the patient's life at risk if not identified and managed at the right time. Vigilant watch should be provided to patients with chronic opioid use.

## ACP Michigan Chapter Scientific Meeting 2021

Oral# 5

Category: Research

Program: Ascension St. John Hospital - Grosse Pointe

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### **Tocilizumab: A Retrospective Multi-Center Cohort Study of Critically Ill Patients with COVID-19**

**Background:** Coronavirus disease 19 (COVID-19) can have a severe presentation requiring admission to the intensive care unit (ICU). Previous retrospective cohort studies in critically ill adults with COVID-19 from the USA and Italy suggest that treatment with tocilizumab benefited survival caused a reduction of inflammatory markers and decreased need for mechanical ventilation. We evaluated the effectiveness of tocilizumab treatment on critically ill patients with COVID-19.

**Methods:** This was a multi-center retrospective cohort study of 154 adults admitted to the ICU for severe COVID-19 pneumonia between March 15th and May 8th, 2020, to Ascension Hospitals. Data were obtained by electronic medical record review. The primary outcome of interest was mortality. Secondary outcomes were ICU length of stay and rates of secondary infections. We used multivariable Cox-regression models to assess the effect of tocilizumab on mortality.

**Results:** Of 154 patients, 34 (21.4%) received tocilizumab. The mean age was 61.5 +/- 14.4 years; the majority were male and African American. Compared to the untreated, the treated were significantly younger, had fewer comorbidities, lower creatinine and procalcitonin levels, and higher alanine aminotransferase levels on admission. The overall case-fatality rate was 71.4%; it was significantly lower in the treated compared to the non-treated (52.9 % vs. 76.7%; p=0.007). In multivariable survival analysis, adjusted for age, several comorbidities, and septic shock, tocilizumab treatment was associated with a 2.1 times lower hazard of mortality when compared to the non-treated (hazard ratio: 0.47; 95% CI: 0.27, 0.83; p=0.009). The average length of stay in the ICU was significantly longer for the treated compared to the non-treated (21.7 +/- 13.2 vs. 7.4 +/- 5.8 days, p<0.0001). The prevalence of secondary infection was higher in the treated group compared to the non-treated without significant difference (41.2% vs. 28.3%; p=0.17).

**Conclusion:** Tocilizumab treatment for critically ill patients with COVID-19 resulted in a lower likelihood of mortality.

## ACP Michigan Chapter Scientific Meeting 2021

Oral# 6

Category: Research

Program: Ascension St. John Providence Hospital

Program Director: Samira Ahsan, MD, FACP

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### **Factors Affecting Clinic Blood Pressure Measurement, Pre and Post Physician Visit in an African American Cohort**

**Introduction:** Accurate measurement of blood pressure (BP) in the ambulatory clinic is critical for maintaining good control. Previously, we found that BP in an African American cohort, as measured by unobserved ambulatory BP (UABP) at the end of the visit, was significantly lower than the BP taken prior to the physician seeing the patient. In this study, our objective was to compare the effect of the presence or absence of a medical assistant (MA) on pre- and post-physician visit BP as measured by a UABP device in an African American cohort.

**Methods:** Academic Internal Medicine clinic patients (n=25/group) with a previous diagnosis of hypertension were recruited for a prospective, non-blinded, non-randomized study. In the exam room an initial BP (Omron 907 (OM)) was taken by a medical assistant (MA). Following the physician visit, a series of three automated measurements were obtained within a 5-minute interval using a Welch Allyn Connex Spot Monitor (WA) device by a MA who either remained in the room (Group 1) or left (Group 2). This was followed by a final OM (single-measurement) reading by the MA. A two-tailed independent T-tests were performed to determine statistical significance using IBM SPSS software.

**Results:** Both groups showed a significant decrease in systolic blood pressures taken later in the visit using the WA (Group 1: 6mmHg decrease, p=.003; Group 2: 8mmHg decrease, p=.001) or the OM (Group 1: 5mmHg decrease, p=.082; Group 2: 8mmHg decrease, p=.002).

**Conclusions:** The results lend credence to the idea that it is the timing of the reading during the visit and not the machine operator that has a significant effect on BP. This study, in concordance with our last, showed that a post-physician visit BP reading may provide a more accurate representation of BP, with or without an MA in the room.

Program: Beaumont Health - Dearborn

Program Director: Ruua Eltierifi, MD, FACP

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**A Novel Combination Chemotherapy Targeting Extramedullary Disease in Multiple Myeloma Following First-Line Treatment Failure**

Introduction:

Multiple Myeloma (MM), a plasma cell neoplasm that resides in the bone marrow's intramedullary space.

Extramedullary disease (EMD) occurs when plasma cells extend through the bone cortex or via hematogenous spread to different organs.

This case of EMD of MM didn't respond to the first line RVD regimen per NCCN guidelines which includes Lenalidomide (Revlimid), Bortezomib (Velcade), and Dexamethasone (Decadron). Therefore, new combination chemotherapy including Daratumumab, and Carfilzomib was initiated with excellent response.

Case description:

62-year-old female presenting to the oncologist for progressive right hip pain for 4 weeks. Initial hip x-ray and bone scan suspected malignancy. MRI showed multiple lytic bone lesions, largest in the proximal femur diaphysis with anterior medial soft tissue mass. Labs revealed elevated IgA and free light chain.

Right femur pathological fracture occurred days later, treated with intramedullary nail fixation. Bone biopsy taken showed solitary plasmacytoma.

Further imaging including CT and PET/CT scans showed widespread osseous metastasis and metastatic involvement of the pancreas, and large soft tissue back lesion inferior to the scapula.

First-line chemotherapy including Lenalidomide, Bortezomib, and Dexamethasone was initiated however there was progression in the back and the pancreatic lesions resulting in obstructive jaundice and severe gastric outlet obstruction. Hence, biliary drain and local pancreatic radiation were done for symptomatic treatment.

New combination chemotherapy with Daratumumab and Carfilzomib was initiated resulting in excellent response and back lesion disappearance. Repeat PET/CT showed overall improvement of lytic lesions and chest and abdominal metastatic disease. Stem cell transplantation was performed followed by maintenance therapy with Daratumumab monthly.

Conclusion:

EMD of MM is an extremely rare and aggressive disease. There is no unified consensus on the treatment approach. This case shows a novel treatment with Daratumumab and Carfilzomib and raises the question of whether a Daratumumab-based regimen should be adopted as a first-line treatment.

## ACP Michigan Chapter Scientific Meeting 2021

Oral# 8

Category: CQI/EBM

Program: Beaumont Health (Royal Oak) Program Med-Peds

Program Director: Stacy Shubeck, MD, FACP

Presenter: Karishma Chopra

Additional Authors: Charity Owusu-Asare, MD; Aimee Espinosa, MD; Alexandra Halalau, MD, MSc, FACP; Pradeep Kaminoulu, MD

### **Diabetic Preventative Care in a Resident Clinic: A Quality Improvement Study**

**Introduction:** Studies have shown significant gaps in diabetic preventative care in resident clinics compared to private clinics of practicing physicians. In our medicine-pediatrics resident clinic at Beaumont Hospital, diabetic point of care resources are largely underutilized. We aim to improve the care of patients with diabetes by increasing resident awareness of point of care A1c and retina scan resources.

**Methods:** A team of residents, attendings, and nurses was created. Baseline data looking at use of point of care resources, specifically the number of orders placed in electronic medical record for A1c and retina scan tests, was obtained. A root cause analysis discovered several contributing factors leading to inefficient diabetic patient care. Key factors included lack of resident awareness on available point of care resources, insufficient equipment, and lack of trained nurses. We completed two Plan Do Study Act (PDSA) cycles to increase resident awareness of clinic resources. The first PDSA cycle involved an educational session for residents, explaining how to order the point of care resources. Six weeks later, a second PDSA cycle involved an informative poster (detailing the resource ordering process) placed in the clinic.

**Results:** Over 6 months, at baseline, 5 patients had retina screening and 2 patients had point of care A1c testing completed out of 62 diabetic patients. After first intervention, 8 patients had A1c testing and 13 patients had retina screening completed, an increase of 300% and 160% respectively from baseline. After second intervention, 22 patients had retina screening completed, an increase of 340% from baseline while there was no change in A1c testing.

**Conclusion:** Increased resident education and awareness led to improved use of point of care diabetic resources. The ability to provide point of care A1c and retina scan results allows for immediate management interventions, earlier detection of complications, and overall improved care.

Program: Beaumont Health Royal Oak

Program Director: Sandor Shoichet, MD, FACP

Presenter: Bipin Ghimire

Additional Authors: Dr. Samiksha Pandey, Dr. Ashbina Pokharel, Dr. Emma Herrman, Dr. Mohammad Mushin Chisti

### **Refractory Non-tumor Lambert Eaton Syndrome Treated with Rituximab**

With a worldwide prevalence of 3-4 per million, Lambert-Eaton syndrome is a rare entity. It often occurs as a paraneoplastic syndrome, most commonly associated with small cell lung cancer. Less frequently, it occurs as an autoimmune disease in the absence of cancer. Both entities demonstrate circulating immunoglobulins against presynaptic voltage-gated calcium channels and Electromyogram (EMG) with an increase in compound muscle action potential on repetitive stimulation.

A 35-year-old female with past medical history of hypothyroidism presented with bilateral lower extremity weakness, generalized fatigue, blurry vision, and slurred speech in 2010. Upon further workup, Lambert-Eaton syndrome was diagnosed after she tested positive for anti-voltage-gated calcium channels antibodies, with suggestive EMG. Workups including CT chest/abdomen/pelvis, Positron Emission Tomography (PET) scan, and colonoscopy were negative for evidence of malignancy. A treatment regimen was initiated which included Intravenous Immunoglobulin (IVIG) every 3-months, Mycophenolate, and intermittent Intravenous Methylprednisolone, but this provided no symptomatic relief. Next, she was started on 3-4, Diaminopyridine (an experimental drug during that time), but her symptoms persisted. She was later hospitalized with quadriparesis, which resulted in her being wheelchair-bound. At that time, Rituximab was started, which dramatically improved her symptoms and normalized her antibodies level. She is now able to walk with minimal assistance and continues to receive Rituximab therapy.

In present times, 3-4, Diaminopyridine is the first-line treatment of Non-tumor Lambert-Eaton syndrome, which has proven to be adequate therapy in most patients. Refractory cases are treated with IVIG. Further management includes immunosuppressive therapy, such as steroids, Azathioprine, Mycophenolate, or Cyclosporine. There has been scattered evidence for the use of Rituximab in patients who have failed immunosuppressive therapy. In our patient, significant improvement in symptoms with Rituximab favors the limited studies that have been completed and further adds to the body of evidence.

## ACP Michigan Chapter Scientific Meeting 2021

Oral# 10

Category: Research

Program: Beaumont Health Royal Oak

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Presenter: Alexa Giovanatti

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### **Social Determinants of Health Correlating with Mechanical Ventilation of COVID-19 Patients; A Multi-center Observational Study**

**Importance:** Several studies have relayed the disproportionate impact of COVID-19 on marginalized communities, however few have specifically examined the association between social determinants of health and mechanical ventilation (MV).

**Objective:** To determine which demographics impact MV rates among COVID-19 patients.

**Design:** This observational study included COVID-19 patient data from eight hospitals' EMR between February 25, 2020 to December 31, 2020. Associations between demographic data and MV rates were evaluated using uni- and multivariate analyses.

**Setting:** Multicenter (8 hospitals), largest health system in Southeast Michigan

**Participants:** Inpatients with a positive RT-PCR for SARS-CoV-2 on nasopharyngeal swab. Exclusion criteria were missing demographic data or non-permanent Michigan residents.

**Exposure:** Patients were divided into two groups: MV and non-MV.

**Main Outcome and Measures:** The primary outcome was MV rate per demographic. A multivariate model then predicted the odds of MV per demographic descriptor. Hypotheses were formulated prior to data collection.

**Results:** Among 11,304 COVID-19 inpatients investigated, 1,621 (14.34%) were MV, 49.96% were male with a mean age of 63.37 years (17.79). Significant social determinants for MV included Black race (40.19% MV vs. 31.31% non-MV,  $p < 0.0001$ ), poverty (18.87% vs. 17.06%,  $p < 0.0001$ ), and disability (12.65% vs. 9.14%,  $p < 0.0001$ ). Black race AOR 1.61 (CI 1.41-1.83), median income AOR 1.01 (CI 1.01-1.01), disability AOR 1.55 (CI 1.26, 1.90), and non-English speaking status AOR 1.26 (CI 1.05, 1.53) had significantly higher odds of MV.

**Conclusions and Relevance:** Black race, low socioeconomic class, disability, and non-English speaking status were significant risk factors for MV from COVID-19. An urgent need remains for a pandemic response program that strategizes care for marginalized communities.

Program: Beaumont Health Royal Oak

Program Director: Sandor Shoichet, MD, FACP

Presenter: Melinda Sagar

Additional Authors: Melinda Sager DO, Devika Aggarwal MD

**Late Onset Burkitt Post Transplant Lymphoproliferative Disorder (PTLD) Following Solid Organ Transplant**

Post Transplant Lymphoproliferative Disorder (PTLD) is an uncommon complication after solid organ transplant, with several different monomorphic subtypes; Burkitt Lymphoma PTLD (B-PTLD) is particularly rare and aggressive.

A 30 year old female with a history of IgA nephropathy and two renal transplants presented to the emergency room with nausea, vomiting, and diffuse abdominal distention and pain that started one week prior to presentation. CT imaging showed significant mesenteric and pelvic lymphadenopathy with moderate ascites, paracentesis was performed. Her immunosuppressive therapy was adjusted: azathioprine was held, tacrolimus was decreased for lower target level, and steroid was continued. A lymph node biopsy was attempted but unable to be performed due to significant edema. Patient left against medical advice but presented 24 hours later to an outside hospital where all immunosuppressive therapy was held, including steroids. Her condition rapidly deteriorated over the following few days she developed profound electrolyte abnormalities, hematemesis, and fever, shock requiring vasopressor support, intubation, and continuous renal replacement therapy. She was transferred back to our facility where ICU level care was continued with the addition of steroids. Ascitic fluid studies were consistent with monomorphic PTLD favoring Burkitt Lymphoma. Lumbar puncture was negative for malignancy. Family initially declined chemotherapy but the patient's condition improved and she was able to be extubated and consented to chemotherapy without significant delay in care. Treatment was started with rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone (R-CHOP) and malignant ascites resolved. CRRT was transitioned to intermittent hemodialysis and then discontinued after recovery of transplanted kidney. She was discharged home without further hospitalizations one month post discharge. Outpatient PET imaging after second round of R-CHOP showed significant improvement of disease.

Our case demonstrates B-PTLD without CNS involvement that responded well to R-CHOP therapy without significant complications.

Program: Beaumont Health Royal Oak

Program Director: Sandor Shoichet, MD, FACP

Presenter: Kamil Sardarli

Additional Authors: Lauren Reinhold DO, Ankit Arora MD, Sumesh Khanal MD, Pradeep Kaminoulu MD, Alexandra Halalau MD, MSc, FACP

### **Improving Telemetry Utilization in an Inpatient Hospital Setting**

**Background:** Telemetry is a cardiac monitor that continuously records heart activity and monitors abnormal rhythms. Most current clinical indications are limited to 48 hours maximum, but telemetry monitoring service (TMS) is commonly used for a greater duration. This leads to resource exploitation that may create limitations of the resource and also comes with economic burden. Limiting usage to appropriate indications and durations can reduce overall costs and improve profit margin for the hospital and also cut down on unnecessary burden for patients. Through our study, we aim to decrease TMS overuse.

**Methods:** The study was done at Beaumont Hospital Royal Oak. It involved gathering TMS utilization data before and after the intervention. One PSA cycle was completed. A root cause analysis showed that TMS was most commonly utilized in patients with arrhythmias, hypoxia, electrolyte imbalances and continued past the recommended timeframe. We placed small (3x3") placards with TMS indications and proper durations in corners of computer monitors at the local workstations on certain floors (6 north and 9 north). These workstations are commonly used by physicians to review their patients. The placards served as a reminder to review proper TMS usage. We gathered TMS utilization data for 1-month before and after the intervention to evaluate TMS use and hence impact of intervention.

**Results:** Pre-intervention average TMS duration was 60 hours and after intervention, average duration was 85 hours with standard deviation of 5.13 and 4.1 respectively. Two sample t-test was significant for a p-value of 0.001.

**Conclusion:** Our study did not achieve the goal to decrease unnecessary TMS orders to optimize the utilization. We believe our study may have been confounded by the COVID-19 pandemic as these patients often required longer durations of TMS. We would recommend utilizing a team-based approach including engaging nursing in the process in order to decrease overutilization of TMS

## ACP Michigan Chapter Scientific Meeting 2021

Oral# 13

Category: Clinical Vignette

Program: Beaumont Health Royal Oak

Program Director: Sandor Shoichet, MD, FACP

Presenter: Markie Zimmer

Additional Authors: Markie Zimmer, MD; Bana Antonios, MD; Emma Herrman, MD; Ramona Berghea, MD

### **Metronidazole Neurotoxicity--Not Your Usual Suspect**

An 85-year-old female with past medical history notable for chronic lymphocytic leukemia and Stage III Merckel cell carcinoma presented to our hospital for evaluation of generalized weakness of a few weeks duration. Notably, she had a recent hospital admission for E. coli bacteremia in the setting of hepatic abscesses that underwent ultrasound guided drainage. She was discharged to inpatient rehabilitation, and ultimately home, with a planned six-week course of ceftriaxone and metronidazole, in addition to oral vancomycin for C. difficile infection.

Upon readmission, she was fatigued and had progressive lower extremity weakness. She denied any bowel or bladder incontinence or saddle anesthesia. She was admitted to the Internal Medicine service with Oncology and Neurology consultations. Prior antibiotics were continued.

Noncontrast CT head showed no hemorrhage. MRI of the lumbar spine showed degenerative changes, without intradural enhancement. Due to the lack of a conclusive diagnosis thus far, EMG was recommended, which showed signs of lumbosacral neuropathy and no evidence of Guillain Barre Syndrome.

She then developed facial twitching and concern for seizure-like activity. Repeat CT head was negative, and she was started on levetiracetam. MRI brain showed abnormal signal intensity with diffusion restriction of the lenticular nucleus bilaterally and symmetrically, which can be associated with transient edema from metronidazole toxicity. MRA was unremarkable. Metronidazole was discontinued and the patient did not have any further seizure activity.

This case highlights an interesting, and uncommon toxicity of metronidazole. The frequency of metronidazole induced encephalopathy (MIE) is unknown. Peripheral neuropathy is common, but the entity can also result in dizziness, ataxia, confusion, encephalopathy and seizures. It can be visualized on MRI and is characterized by bilateral, symmetric T2 hyperintense lesions that resolve after cessation of the drug. High clinical suspicion must be present to warrant neuroimaging to secure the diagnosis.

Program: Beaumont Hospital – Royal Oak

Program Director: Sandor Shoichet, MD, FACP

Presenter: Antonio Faieta

Additional Authors: Antonio Faieta, Khatoon Tawhida

### **Type 1 Cryoglobulinemia Secondary to Primary Plasma Cell Leukemia**

Primary plasma cell leukemia (pPCL) is a rare and aggressive form of plasma cell dyscrasia that comprises 1% of the plasma cell dyscrasias. Even more rare is its association with type 1 cryoglobulinemia which management can be challenging. A 63-year-old African American male with no past medical history presented with severe burning pain in his legs, necrotizing rash, constitutional symptoms and severe acute kidney injury (AKI). HIV, hepatitis B and C were negative. Serum electrophoresis revealed an M-spike of 5.67, IgG of 7000, free lambda of 152.10 with a K/L of 0 and cryoglobulin of 81%. CT revealed extensive lytic lesions throughout the spine. Skin biopsy revealed thrombotic vasculopathy. Bone marrow biopsy revealed 80% dysplastic plasma cells. Flow cytometry of peripheral blood showed dysplastic plasma cells with high expression of CD38 and CD138 but negative for CD19, CD20, CD56 and CD117. FISH revealed t(11;14)(q13;q32) resulting in IGH/CCND1 gene rearrangement. Type 1 cryoglobulinemia secondary to IgG/lambda primary plasma cell leukemia was diagnosed. Patient's pain worsened and skin lesions increased in size and new eruptions appeared in other parts of the body, so plasmapheresis was initiated. After six plasmapheresis cycles, skin lesions stabilized, no new lesions appeared, pain regimen was weaned and AKI resolved. Cryoglobulin level became undetectable after four plasmapheresis cycles. VRD (bortezomib, lenalidomide, dexamethasone) was started during the hospitalization. No evidence of tumor lysis syndrome was noted. Patient was successfully discharged 3 weeks after presentation. Three months later, patient achieved a very good response. This case illustrates the rapidly progressive nature of type 1 cryoglobulinemia in patients with pPCL. Thus, recognition of severe organ dysfunction should raise consideration for plasmapheresis. In a case series by Payet et al., patients treated promptly with plasmapheresis achieve disease stabilization in 90% of the cases and those who had it delayed eventually required dialysis or skin surgery.

Program: DMC Huron Valley-Sinai Hospital

Program Director: Jeet Pillay, MD, FACP

Presenter: Ellyn Velasco

Additional Authors: Reema Siddiqui MD, Erica St. Lawrence MD

### **A Hard Pill to Swallow: A Unique Presentation of a Saccular Aneurysm**

The majority of unruptured cerebral aneurysms are asymptomatic and incidentally diagnosed on imaging. Common symptoms include headache, eye pain, seizures or visual loss. Saccular aneurysms are the most common form of cerebral aneurysms and are named due to their round appearance and location off of one of the main cerebral arteries. Approximately 85% of intracranial aneurysms are located in the anterior circulation. However, aneurysms in the posterior circulation are at a much higher risk of rupture. An 80 year old women presented to the hospital for complaints of progressive dysphagia with 8-10 lb weight loss over the past 6 months and noticeable worsening over the past 10 days. She states she has frequently been choking with both solids and liquids, with an associated difficulty swallowing. She denies feeling of globus sensation but points to the middle of her neck to localize the area where the food stays before she eventually coughs it up. On physical exam, she was noted to have a right-sided neck fullness. A CT Neck was ordered for the evaluation of her neck mass. The CT showed evidence of a heterogenous thyroid and incidentally showed evidence of a saccular aneurysm with compression of the cervical medullary junction. Neurovascular surgery evaluated the patient; MRA head/neck and MRI brain were ordered. MRA revealed a 1.4 x 1.2 cm aneurysm originating from the left distal intracranial vertebral artery and causing concurrent mass effect on the medulla. Her saccular aneurysm was thought to be the cause of her progressive dysphagia. If imaging had not been ordered for evaluation of her neck, her saccular aneurysm would likely have gone undiagnosed. Given its location and size, it also carries a higher risk of rupture.

Program: Henry Ford Allegiance Health

Program Director: Vivek Kak, MD, FACP

Presenter: Mehakmeet Bhatia

Additional Authors: Parth Patel, MD, Vivek Kak, MD

### **Thinking Beyond Bacterial: A Case of Cutaneous Blastomycosis**

#### Introduction:

Blastomycosis is caused by a dimorphic fungus, *Blastomyces dermatitidis*, that mainly causes pulmonary disease. Cutaneous blastomycosis is infrequent and tends to be misdiagnosed given its similar presentation to other cutaneous fungal infections and malignancies.

#### Case description:

A 51-year-old female presented with a two-month history of disfiguring nasal lesion. The patient had a past medical history of cervical cancer in remission. Social history was significant for frequent travel throughout the US as a truck driver, including the Midwest. The patient had a non-purulent verrucous plaque on her right nare, which was painless and mildly pruritic. Superficial cultures grew *Enterococcus faecalis*, prompting treatment with oral cephalexin and topical mupirocin. Given no relief, the patient was started on clindamycin followed by Augmentin. Both treatments were unsuccessful.

The lesion was then biopsied and fungal cultures were sent. The biopsy showed broad-based budding yeast surrounded by pseudoepitheliomatous hyperplasia, and cultures grew *Blastomyces dermatitidis*. The patient was initiated on 200 mg itraconazole three times daily for the first three days, followed by 200 mg itraconazole twice daily for the next 12 months. She showed notable improvement within a month.

#### Discussion:

This patient was initially misdiagnosed with bacterial infection due to superficial cultures, which were likely a contaminant. It was only after a biopsy that the patient was accurately diagnosed. Besides bacterial infection, cutaneous blastomycosis is often confused with coccidioidomycosis, mycobacterium or squamous cell carcinoma. In patients presenting with persistent facial lesions in the setting of a frequent travel history, fungal etiologies should be high on the differential. Patients such as ours with a competent immune system, should raise suspicion for blastomycosis as it tends to affect immunocompetent hosts more frequently than other fungal infections. A biopsy and fungal cultures should be sent at the outset for accurate diagnosis and treatment.

Program: Henry Ford Health System – Detroit

Program Director: Odaliz Abreu Lanfranco, MD, FACP

Presenter: Kartik Gupta

Additional Authors: Rajat Kalra, Vardhmaan Jain, Rishab Gupta, Navkaranbir S. Bajaj

**Sleep Duration, Baseline Cardiovascular Risk, Inflammation and Incident Cardiovascular Mortality in Ambulatory U.S. Adults**

Introduction:

The interplay between sleep duration and inflammation on the baseline and incident cardiovascular (CV) risk is unknown. We sought to evaluate the association between sleep duration, C-reactive protein (CRP), baseline CV risk, and incident CV mortality.

Methods:

We used data from the National Health and Nutrition Examination Survey 2005-2010 linked with the cause of death data from the National Center for Health Statistics for adults aged  $\geq 18$  years. The associations between self-reported sleep duration and CRP, 10-year atherosclerotic CV disease risk score (ASCVD) and CV mortality were assessed using Linear, Poisson and Cox proportional hazard modeling as appropriate.

Results:

There were 17,635 eligible participants with a median age of 46 years (interquartile range [IQR] 31, 63). Among them, 51.3% were women and 46.9% were non-Hispanic Whites. Over a median follow-up of 7.5 years (IQR 6, 9.1), 350 CV deaths occurred at an incident rate of 2.7 per 1000-person years (IQR 2.4, 3.0).

We observed a U-shaped associations between sleep duration and incident CV mortality rate (P-trend=0.011), sleep duration, and 10-year ASCVD risk (P-trend <0.001), as well as sleep duration and CRP (P-trend <0.001).

A self-reported sleep duration of 6-7 hours appeared most optimal. We observed that those participants who reported <6 (short sleep) or >7 hours (long sleep) of sleep had higher risk of CV death attributable to inflammation after accounting for confounders.

The population attributable fraction of inflammation (CRP  $\geq 0.3$  mg/dL) for CV mortality was 14.1% (95% CI 4.4, 22.9,  $p < 0.05$ ) for short sleep, and 12.8% (95% CI 4.0, 20.8,  $p < 0.05$ ) for long sleep vs. 11.2 (95% CI 3.6, 18.2,  $p < 0.05$ ) for optimal sleep in the multivariable model

Conclusions:

There was a U-shaped relationship of incident CV mortality, 10-year ASCVD risk, and CRP with self-reported sleep duration. These findings suggest an interplay between sleep duration, inflammation, and CV risk.

Program: Hurley Medical Center - Flint

Program Director: Ghassan Bachuwa, MD, FACP

Presenter: Dominic Awuah

Additional Authors: Murtaza S. Hussain, Abdullahi Maghoub, Anoosha Ponnappalli, Smit S Deliwala, Ghassan Bachuwa, Khalil Katato

### **T cell Lymphoma-Associated Paraneoplastic Hypereosinophilia**

#### **INTRODUCTION:**

A review of the literature revealed 2 cases of paraneoplastic eosinophilia, and several cases of hypereosinophilic syndrome associated with T-cell lymphoma. We present another case of paraneoplastic hypereosinophilia associated with T cell lymphoma.

#### **CASE PRESENTATION:**

A 73 year old Caucasian male presented with leukocytosis (WBC) of 13.3k/uL, 4,815 eosinophils/uL, at 36.2% and unintentional weight loss of 20 lbs over 3 months.

Within 3 months, leukocytosis and eosinophilia had worsened, reaching WBC of 23.81k/uL and 17,750 eosinophils/uL at 65%. By this time, the patient was experiencing abdominal pain, bloating, distension and diarrhea with stool microscopy showing Giardia lamblia cysts. Diarrhea resolved after 1 week of oral Metronidazole with residual bloating and distension; however the leukocytosis and eosinophilia progressively worsened to 38.87k/uL, and 28,110/uL respectively. Computerized tomography (CT) of the abdomen and pelvis reported mesenteric and retroperitoneal lymphadenopathy with ascites; whole body positron emission tomography (PET) demonstrated the largest conglomerate of lymph nodes in the mesentery measuring 15.9x8.0cm. Paracentesis reported chylous ascites with eosinophilia but no malignant cells. Image-guided mesenteric lymph node core biopsy reported CD4+ T-cell lymphoma and bone marrow biopsy reported benign eosinophilia without lymphoma involvement. Patient was started on CHOP chemotherapy (cyclophosphamide, doxorubicin, vincristine and prednisone). After the first cycle of chemotherapy, WBC declined to 9.0k/uL and eosinophils to 200/uL. Post-third cycle chemotherapy abdominopelvic CT demonstrated diminution of the largest mesenteric lymph node conglomerate to 5.0cm and resolution of ascites. The plan is to complete 6 cycles of CHOP and follow-up PET scan.

#### **DISCUSSIONS:**

This case represents a rare paraneoplastic manifestation of severe eosinophilia from CD4+ T-cell lymphoma which resolved completely post the first cycle of chemotherapy.

Clinicians should explore underlying T-cell lymphoma diagnosis for unexplained severe eosinophilia.

Program: Hurley Medical Center - Flint

Program Director: Ghassan Bachuwa, MD, FACP

Presenter: Ibukun Fakunle

Additional Authors: Areeg Bala, Lalida Kunaprayoon, Anoosha Ponnappalli, Prajwal Shanker, Elfateh Seedahmed

### **Effect of Varied Insulin Dose in Management of Hyperkalemia: A Systematic Review and Meta Analysis**

**Rationale:** Hyperkalemia is a frequently encountered metabolic derangement in the critical care setting. One of the methods of hyperkalemia management is the use of injectable insulin. Standard of care recommendations include the use of 10 – 20 units of insulin. There is evidence to show lower dosage having similar effectiveness.

**Objective:** Our aim was to assess if using a lower dose of insulin would result in a similar decrease in serum potassium.

**Methods:** We searched electronic databases from inception to August 2020 for prospective and retrospective cohort studies. We calculated weighted mean difference (MD) and their 95% corresponding confidence intervals for continuous variables using an inverse variance test.

For dichotomous variables, we calculated the odds ratios (OR) along with corresponding 95% confidence intervals (CI) using the random Mantel-Haenszel method.

We included 9 retrospective cohort studies with a total of 3,298 events.

**Results:** There was no significant difference between groups in the decrease in serum potassium when comparing use of low dose insulin to standard (higher) dose insulin. [OR = 0.03; 95% confidence interval (CI) -0.06-0.11; P = 0.53]. There were however, significant differences between groups in the clinical outcome of mild hypoglycemia [OR = 0.48; 95% confidence interval (CI) 0.26-0.86; P = 0.01], and severe hypoglycemia [OR = 0.41; 95% confidence interval (CI) 0.27-0.65; P = < 0.0001]

There was no significant difference between groups in the clinical outcome of rebound hyperkalemia - [OR 0.85; 95% confidence interval (CI) 0.6-1.21; P = 0.37].

**Conclusion:** This meta-analysis showed that lower injectable insulin dosing strategy for treatment of hyperkalemia is as effective as standard, higher dosing strategy. The meta-analysis also shows lower dosing strategy results in lower rate of hypoglycemia, both mild and severe. While cohorts receiving low dose insulin were less likely to have rebound hyperkalemia, this finding did not reach statistical significance.

Program: Hurley Medical Center - Flint

Program Director: Ghassan Bachuwa, MD, FACP

Presenter: Murtaza Hussain

Additional Authors: Murtaza S. Hussain MD, Dominic O. Awuah MD, Anoosha Ponnappalli MD, Abdullahi Mahgoub MD, Smit S Deliwala MD, Ghas

### **Subacute Combined Degeneration From N2O Tablet Overdose**

#### **INTRODUCTION**

Nitrous oxide (N<sub>2</sub>O) was initially synthesized in 1772, and was first used as analgesia in the 1800s. Currently, it is found in the food industry as a foaming agent and in the medical field for sedation and anesthesia. N<sub>2</sub>O induced Vitamin B12 deficiency is well established biochemically. Vitamin B12 is a cofactor for two enzymes; methionine synthase and methylmalonyl coenzyme A mutase. N<sub>2</sub>O inactivates Vitamin B12 rendering the enzymes obsolete. This phenomenon has clinically surfaced in recent years as N<sub>2</sub>O is easily available through whipped cream canisters or propellants, 'whippets', to induce hallucinogenic and euphoric effects.

#### **CASE PRESENTATION**

We present a case of a 34 year old caucasian male with undiagnosed depression, who had experimented with various designer drugs including N<sub>2</sub>O tablets for over a year. As his usage increased, his neurologic symptoms and deficits worsened to the point of hospital admission; numbness and tingling, generalized weakness, shuffling gait, hyperreflexia, and Babinski sign. Laboratory workup revealed macrocytic anemia, elevated Vitamin B12, homocysteine, and methylmalonic acid (MMA) levels. Neurology performed lumbar puncture (LP) which ruled out differentials of cervical myelopathy; acute inflammatory demyelinating polyneuropathy, transverse myelitis, and Guillain Barre syndrome. Moreover, magnetic resonance imaging (MRI) demonstrated a T2 bright signal involving the posterior cord from C1-C5, and a few axial images showing inverted V sign; imaging findings consistent with subacute combined degeneration (SCD). He was administered high dose intravenous (IV) Vitamin B12 which gradually improved his symptoms.

#### **DISCUSSION**

In the age of the internet, recreational drugs are easily accessible through laptop computers and phones, and we believe more cases are to emerge. The astute clinician should be perceptive to rapid onset neurologic deficits in young patients without significant medical history, and should have a low threshold for suspecting functional vitamin B12 deficiency after ruling out other organic differentials.

Program: Lakeland Regional Medical Center

Program Director: Michael Wang, MD

Presenter: Edward Cay

Additional Authors: Thomas Birris, MD

### **Liver Scan Sign on Hepatobiliary Scintigraphy in the Setting of Tribulus Induced Liver Injury**

Herbal and dietary supplements comprise about 15-20% of drug induced liver injury. Tribulus Terrestris is a plant of the Caltrop family native to tropical regions. While it has been used as an extract for stamina and performance enhancement, only a few cases have been reported of its potential hepatotoxic effects.

We present a 19 year-old male with nonradiating right upper quadrant pain for three days. Patient reported no alcohol or recreational drug use; however, he had been using Tribulus to help increase his energy. Initial work up was significant for elevated transaminases and alkaline phosphatase, and while abdominal ultrasound showed no gallstones, the dilation of the common bile duct was concerning for choledocholithiasis. Viral hepatitis panel returned unremarkable and MRCP confirmed neither biliary dilation nor gallstones.

Patient continued to have intermittent episodes of postprandial pain, so hepatobiliary scintigraphy was obtained, showing prompt uptake of radiotracer by the liver but no activity within the biliary system or bowel even at four hours, consistent with "Liver Scan" sign. Patient's hepatic panel improved over the next several days with resolution of abdominal pain, with continued cessation of Tribulus on discharge.

Hepatobiliary scintigraphy is utilized to diagnose acute cholecystitis when abdominal ultrasound is equivocal. Hepatocellular injury may affect any stage of this study. This patient exemplified a hepatocellular pattern of injury, which is known to be more frequent with herbal supplementation compared to liver injury due to conventional medications. In this case, while the "Liver Scan" sign may indicate high grade biliary duct obstruction, in the absence of biliary dilation and gallstones on MRCP, this radiographic finding is clinically most consistent with intrahepatic induced liver injury. According to the Roussel Uclaf Causality Assessment Method (RUCAM) scale, it is probable that Tribulus caused liver injury in this patient.

Program: Lakeland Regional Medical Center

Program Director: Michael Wang, MD

Presenter: Michelle Kirk

Additional Authors: Trixie Cruz, MD, Furqan Siddiqi, MD

**Missing Hallmark: Anti-GBM Disease Presenting Without Glomerulonephritis**

Anti-GBM (glomerular basement membrane) or Goodpasture disease is a rare autoimmune small vessel vasculitis defined by the triad of rapidly progressing glomerulonephritis, alveolar hemorrhage and the presence of type IV collagen anti-GBM antibodies. Therapy focuses on preventing end stage renal disease with a combination of prednisone, cyclophosphamide, and plasmapheresis.

A 90-year-old woman was admitted with novel oxygen requirement for severe hypoxia and anemia. Chest radiography showed a new right upper lobe consolidation without clinical findings to suggest pneumonia or infection. Normocytic anemia persisted despite multiple transfusions and her respiratory failure required maximum non-invasive therapy raising suspicion for pulmonary hemorrhage. Diuresis had no improvement to her respiratory status and was limited by rapidly declining kidney function. Initial and repeat urinalyses were unremarkable and without hematuria or proteinuria. Her pulmonary symptoms and progressive renal failure despite a bland urinalysis were suggestive of multi-organ vasculitis. An autoimmune panel showed elevated MPO-ANCA titer and a positive anti-GBM antibody assay. Double-seropositive anti-GBM disease with both MPO-ANCA and anti-GBM antibodies is a rare presentation typically seen in men with pulmonary hemorrhage and recurrence of disease after treatment. This patient was unable to tolerate a confirmatory biopsy and the initiation of treatment resulted in significant mental deterioration. Discussion about long-term outcomes and goals of care guided a transition to hospice where she passed from respiratory failure from diffuse alveolar hemorrhage.

Anti-GBM disease has an incidence fewer than two cases per million with a bimodal distribution of young men with the classic triad and women in their sixth and seventh decade with isolated glomerulonephritis. This was an atypical presentation outside of the standard age range presenting with pulmonary hemorrhage and without the typically seen glomerulonephritis. This rare double-seropositive presentation of an already rare disease shows the importance of a broad differential and recognizing diagnoses beyond their classic presentation.

Program: McLaren Reg Med Ctr/MSU - Flint

Program Director: Parul Sud, MBBS. FACP

Presenter: Mehak Qureshi

Additional Authors: Mehak Qureshi, MD ; Basel Abdelazeem, MD ; Ashiya Khan, MD ; Mazen Najjar, MD

### **A Rare Presentation of Cryptococcal Meningitis in a Treatment-Naive Patient with Sarcoidosis**

*Cryptococcus neoformans* is an encapsulated, yeast-like fungus that commonly lives in the environment due to soil contamination by bird excretions, especially pigeons. *Cryptococcus* is an opportunistic fungal infection commonly diagnosed in immunocompromised patients like HIV, steroid use, malignancy, history of organ transplantation, and, rarely, sarcoidosis. Only a few cases have reported *cryptococcus* infection in sarcoidosis patients and not on steroids treatment. Herein, we present one to highlight the importance of considering opportunistic fungal infection in asymptomatic treatment-naive sarcoidosis patients.

We present a case of 46-year-old Caucasian female presented with an 8-week history of headaches associated with low-grade fevers, chills, generalized weakness, and bilateral hearing impairment. The patient's medical history was significant for biopsy-proven sarcoidosis, for which she was not on any chronic medications. The patient was first diagnosed with pulmonary nodules in 2014 through a CT chest and then underwent bronchoscopy with endobronchial biopsy in 2014, which confirmed the diagnosis of sarcoidosis. However, the patient did not warrant any treatment at that time as she was a mild case, but she was unfortunately lost to follow-up. The patient had lumbar puncture as the CSF samples were sent to be analyzed for tuberculosis, fungal infections, bacterial and viral infections. The bacterial CSF culture and AFB culture were negative, but the fungal CSF culture was positive for *C. neoformans*. The patient antibiotic was changed to IV Amphotericin B.

Sarcoidosis Cryptococcal meningitis is one of the rare complications of sarcoidosis due to the impaired T-cell immunity resulting from the sequestration of CD4-T cells into granulomas that results from the suppression of T-cell proliferation. Our case highlights the possibility of fungal infections in patients with a history of asymptomatic sarcoidosis despite being treatment-naïve. Physician should maintain a high level of suspicion for cryptococcal meningitis in a patient with asymptomatic sarcoidosis.

Program: Michigan State University - Lansing

Program Director: Supratik Rayamajhi, MD, FACP

Presenter: Rohan Prasad

Additional Authors: Abdullah Al-abcha, Mohammad Fahad Salam, Majid Yavari, Zulfiqar Qutrio Baloch, Supratik Rayamajhi, George S Abela

### **Transcatheter Mitral Valve Repair and Medical Therapy in Severe Mitral Regurgitation and Heart Failure: A Meta-Analysis**

The sequelae of heart failure and left ventricular dysfunction is secondary mitral regurgitation, which is defined as mitral regurgitation due to primary left ventricular dysfunction with normal mitral valve leaflets and chords, and volume overload. Transcatheter mitral valve repair can be done via the MitraClip device (Abbott Vascular, Abbott Park, Illinois and Santa Clara, California) to improve symptoms and mortality rate. Previous randomized controlled trials (RCTs) with short-term durations were deemed superior versus guideline-directed medical therapy in patients with severe secondary mitral regurgitation and symptomatic heart failure. Recently, the trials have published updated data with longer durations. Therefore, we conducted this meta-analysis to compare the risk profile of TMVR devices versus a control group of medical therapy in patients with symptomatic heart failure. The primary outcome was all-cause mortality. Furthermore, secondary outcomes included cardiovascular mortality and hospitalization for heart failure. Statistical analysis was conducted using Review Manager 5.4. A total of 918 patients were included with a median-weighted follow-up period of 2.67 years. In regards to the primary outcome, all-cause mortality was significantly lower in the device group (odds ratio (OR) 0.74, 95% confidence interval (CI) 0.57-0.97,  $p=0.03$ ,  $I^2=63\%$ ) (Figure 1). Additionally, the rate of cardiovascular mortality (OR 0.74, 95% CI 0.56-0.97,  $p=0.03$ ,  $I^2=44\%$ ) and hospitalization for heart failure (OR 0.47, 95% CI 0.36-0.61,  $p<0.00001$ ,  $I^2=86\%$ ) statistically favored the device group arm. In conclusion, this updated meta-analysis of the MITRA-RF and COAPT trials illustrates that in the long-term setting TVMR devices have significantly decreased side effects of all-cause mortality, cardiovascular mortality, and hospitalization for heart failure as compared to guideline-based medical therapy in patients with severe secondary mitral regurgitation and symptomatic heart failure.

## ACP Michigan Chapter Scientific Meeting 2021

Oral# 25

Category: Clinical Vignette

Program: St. Joseph Mercy - Ann Arbor

Program Director: Patricia McNally, MD, FACP

Presenter: Elliot Berinstein

Additional Authors: Fadi N. Hawa, and Naresh T. Gunaratnam

### COVID-19 Induced Gastroparesis: A Case Report

#### Introduction:

Gastroparesis is a chronic condition defined by delayed gastric emptying in the absence of a mechanical obstruction with an estimated prevalence of up to 2% in the general population. The cardinal symptoms of gastroparesis are nausea, vomiting, early satiety, and upper abdominal pain. The two most common etiologies are idiopathic and diabetes. However, a significant amount of post-viral cases have been described. We report a case of gastroparesis in an otherwise healthy patient after a mild SARS-CoV-2 infection.

#### Case:

A healthy 32-year-old female acquired a mild SARS-CoV-2 infection in March 2020 presenting with dyspnea, cough, and fevers, without any gastrointestinal symptoms. Approximately 8 weeks from her acute infection, she started complaining of nausea, vomiting, abdominal pain and early satiety, which was unresponsive to ondansetron and promethazine. Computed tomography of the abdomen was unremarkable and upper endoscopic evaluation revealed retained food in the stomach. The patient did not tolerate a gastric emptying study because of post-prandial emesis after the test meal. Her clinical course was complicated by failure to thrive and over 50 pounds of weight loss requiring gastrojejunal tube placement for post-pyloric tube feeding. Endoscopic Botox injection was attempted which provided the patient with 3 months of relief and the ability to tolerate her tube feeds before requiring another Botox injection.

#### Discussion

Although gastroparesis was not definitely diagnosed in our patient with a gastric emptying study, the patient's upper endoscopy findings of retained food products, symptomatic improvement with Botox injections, and negative cross-sectional imaging for a mechanical obstruction are highly suggestive of gastroparesis. Viral infections are a common cause of gastroparesis. To our knowledge this is the first case report of SARS-CoV-2 induced gastroparesis in an otherwise healthy individual. This case illustrates the devastating and severe long-term disorders that may result from a mild case of SARS-CoV-2 infection.

## ACP Michigan Chapter Scientific Meeting 2021

Oral# 26

Category: CQI/EBM

Program: St. Joseph Mercy - Ann Arbor

Program Director: Patricia McNally, MD, FACP

Presenter: Christopher Savvides

Additional Authors: Dr. Ola Al-Sous, Dr. Sunaina Gowda Ramesh Babu, Dr. Agara Kumar, Dr. Ann Wilkie, Amanda Paulus

### **Improving Active Foley Catheter Use Awareness and Proactive Removal Planning Among Inpatient Resident Teams**

#### Introduction:

Foley catheter-related urinary tract infections (CAUTI) occur at a rate of 0.2–4.8 per 1,000 catheter-days in adult inpatient units and are associated with increased length of stay and mortality. Duration of catheterization is among the most important risk factors for developing CAUTIs. This project aimed to improve the inpatient internal medicine resident teams' awareness of Foley catheter usage through increased Foley documentation. Our goal was to improve documentation by 20% within four months.

#### Methods:

Two-folded intervention was implemented. One aimed to improve the awareness of Foley usage. Teams were encouraged to itemize individual rounding lists to include an under-utilized active Foley status column. We then created an electronic smart phrase which prompted a list of FDA approved Foley indications, insertion date, and planned voiding trial date. The second targeted the knowledge gap. A didactics lecture was given a few weeks later and residents were educated about CAUTI, Foley usage, and the project interventions. Metrics tracked were usage of the smart phrase and its components including indication, placement/removal date, and catheter duration. Data was collected weekly through EMR generated reports.

#### Results:

Documentation of active Foley use was tracked during the planning phase and was used as baseline. Pre-intervention median documentation rate per Foley-day was 23%. At 19 weeks, the median post-intervention rate improved to 63.5% with the last four runs above the new median. A sustained shift was noted after the educational session.

#### Discussion:

There are several reasons for prolonged utilization; active use unawareness, misunderstanding of catheter indications, and early cessation of intermittent straight catheterization. This project demonstrates the importance of accurate documentation and its role in reducing unnecessary and potentially harmful interventions. Analyzing utilization patterns allowed us to uncover further opportunity for improvement during transition of care times. This is being further investigated in a subsequent PDSA cycle.

Program: St. Joseph Mercy - Oakland

Program Director: Geetha Krishnamoorthy, MD, FACP

Presenter: Justin Khine

Additional Authors: Ghadeer, Hannoudi

**Outcomes of Patients with Chronic Kidney Disease and End-Stage Renal Disease Hospitalized with CoViD-19: A Retrospective Cohort**

Introduction

The SARS-CoV-2 pandemic has created a stir of publication activity regarding nearly all forms of demographics and risk assessment models to predict morbidity and mortality in hospitalized CoVID-19 patients. Here we use a large patient cohort, multivariate regression models, and inverse probability of treatment weights (IPTWs) to determine the effect of kidney disease on mortality in hospitalized CoVID-19 patients.

Methods

6,737 hospitalized, SARS-CoV-2 positive patients were analyzed for common dimensions of risk factors for increased mortality. Univariate, multivariate logistic regression, and IPTW propensity scoring models were used for each variable on outcomes of interest. Both fully adjusted multivariate regression models and IPTW models required population trimming, thus analysis for fully adjusted (N=6,117) and IPTW (N=4131) models contained smaller subsets.

Results

Initial unadjusted models show significant increases in all outcomes of interest in patients with any level of renal disease. However, there was no association with increased mortality as a result of renal disease after adjusting for covariates. Fully adjusted and IPTW models find that patients with renal dysfunction have significantly higher risks of requiring vasopressors, longer duration of hospitalization, and average higher SOFA scores. In CKD patients, SOFA scores were 1.34 times higher ( $p<0.001$ ) versus control patients. ESRD patients experienced higher likelihood of requiring vasopressors (RR=1.46;  $p=0.40$ ), were hospitalized longer (IRR=1.19;  $p<0.001$ ), and had higher SOFA scores (IRR=1.98;  $p<0.001$ ) than control patients.

Conclusion

Many papers describe increased mortality in CoVID-19 patients with renal diseases of various stages. Most of these are simplified incidence statistics from hospital centers or dialysis units. Here, we show that renal disease in of itself does not directly lead to increased mortality in CoVID-19 patients. Initial findings of increased mortality in CKD and ESRD patients may more likely be a result of chronic disease burden as shown by sequela comorbidities seen in CKD and ESRD patients.

Program: St. Joseph Mercy - Oakland

Program Director: Geetha Krishnamoorthy, MD, FACP

Presenter: Ruchi Shah

Additional Authors: Yaqub Nadeem Mohammed, MD; Jasmeet Kaur, MD; Anupam Sule, MD; Geetha Krishnamoorthy, MD

**Antiphospholipid Antibodies and Vitamin D Deficiency in COVID-19 with and Without Thrombosis: A Pilot Case-Control Study**

**Objective:** Coronavirus disease-2019 (COVID-19) is associated with thromboembolism. Antiphospholipid antibody (APLa) formation is one of the mechanisms. Vitamin D deficiency has been associated with thrombosis in antiphospholipid antibody syndrome. We measured APLa and vitamin D levels in hospitalized COVID-19 patients with and without thrombosis to evaluate if concomitant APLa and vitamin D deficiency increases thromboembolic risk.

**Methods:** Case-control study. Hospitalized adults with COVID-19 with a thromboembolic event (ischemic stroke, myocardial infarction, deep venous thrombosis/pulmonary embolism, Cases n=20). Controls (20): Age, sex-matched without any thromboembolic event. Patients with autoimmune disorders, antiphospholipid antibody syndrome, thrombophilias, anticoagulation therapy, prior thromboembolic events, chronic kidney disease 3b, 4, end-stage renal disease, and malignancy were excluded. Literature shows that 50% of COVID-19 patients have at least one APLa and those with elevated partial thromboplastin time have 90% prevalence of APLa. Based on this, assuming a difference of 40%, with  $\alpha=0.05$  and  $\beta=0.20$ , we would be able to detect a statistically significant difference with 20 patients in each group, using chi-square test. Anti-cardiolipin IgG/IgM, beta-2 glycoprotein-1 IgG/IgM, lupus anticoagulant and 25-hydroxy vitamin D level were measured in both cases and controls. Comparisons done with t-test or Mann Whitney for quantitative data. Chi-square or Fisher's exact test for nominal variables.

**Results:** Cases were 5.7 times more likely to be vitamin D deficient (OR: 5.7, 95% CI:1.3-25.6) and 9 times more likely to have any one APLa (OR: 9, 95% CI: 1.6-49.5). Patients with both APLa and vitamin D deficiency had significantly more clots compared to patients who were antibody positive with no vitamin D deficiency (100% vs 47.4%;  $p=0.01$ ).

**Conclusions:** Coexistence of APLa and vitamin D deficiency was associated with thrombotic complications in COVID-19. Future studies in COVID-19 should include screening for vitamin D deficiency and assess the role of vitamin D supplementation in reducing thrombotic complications.

Program: University of Michigan - Ann Arbor

Program Director: John DelValle, MD, FACP

Presenter: Sang Gune Yoo

Additional Authors: Mehwish Ahmed, Theresa Anderson, Vanessa Scowden, Rachel Perlman

**Compassion Rounds: Implementing a Bias Literacy Curriculum at a Large Internal Medicine Residency Program**

**BACKGROUND:** Implicit and structural biases create a system that favors certain populations over others, which adversely influence the health of minority and underserved populations. To improve training on these biases within our residency program, we developed a curriculum titled 'Compassion Rounds' to address these biases.

**METHODS:** We performed a general needs assessment via literature review and one-on-one interviews. An anonymous targeted needs assessment survey was sent to our approximately 180 residents with a 46% response rate. Core investigators then began to develop sessions based on the responses. Educational strategies included interactive didactics and case discussions. Pre-curriculum and post-session surveys were submitted for evaluation of the curriculum

**RESULTS:** The pre-curriculum survey leading topics were drug addiction, socioeconomic status, gender, gender identity, race, and mental health and disabilities. 42% of respondents preferred noon conference sessions, 21% preferred morning report and 19% preferred team learning sessions during ambulatory blocks. The most popular mode of learning was small group discussions (44%) followed by didactics (26%). Our pre-curriculum survey had a response rate of 52%. 80% believed that education on implicit and structural biases is important for health care providers. 78% were either interested or may be interested in learning more. In comments, many respondents were interested in the topic however some felt prior training had not provided practical implementation strategies.

**CONCLUSIONS:** Implementing a bias literacy curriculum in a large Internal Residency program requires the input of the residents. We intend to send a post-curriculum survey to evaluate perceived usefulness, commitment to change, knowledge, and feedback. We aim to create a three-year curriculum for continued training and plan to share our findings with other residency programs to promote health equity learning nationally.

Program: Wayne State University - Detroit

Program Director: Jarrett Weinberger, MD, FACP

Presenter: Georgiana Marusca

Additional Authors: Aws Polina, Jing Wang, Anirudh Damughatla, Vaishnavi Kamatham, Adam Pearl, Miranda Sterner, Ethan Stahl, Diane L. Levine

### **Enhancing Guideline-Based Hepatitis C Screening in the Outpatient Metro Detroit Population**

Hepatitis C virus (HCV) accounts for approximately 1% of chronically infected people worldwide, yet only 39.4% of the adult population worldwide is aware of their HCV status. HCV infection is one of the main causes of chronic liver disease. If discovered early, HCV is a treatable infection with a high success rate. Previous guidelines recommended screening only patients born between 1945 and 1965. However, one-third of people between the ages of 18 – 30 who inject drugs are infected with HCV. The new guidelines from the USPSTF now recommend screening all adults between the ages of 18 and 79 for HCV. A group of Internal Medicine residents and three medical students collaborated on a Quality Improvement project to increase the screening rates of patients in the Metro Detroit area based on the new USPSTF guidelines. A charter was developed with the smart aim to improve HCV screening of adults, ages of 18-79, in the resident teaching clinic by 20% in the next six months. Baseline HCV screening data was collected over one week. The intervention consisted of a standardized text message sent to a resident cohort prior to the start of each clinic week. The percent screening rate for Hepatitis C based on the new USPTF guidelines for the baseline week, defined as one week prior to the start of the intervention, was 9.6%. With each subsequent week that included a standardized intervention via text message, the percent screening rate ranged between 21% on week one of intervention to 26% by the end of the five weeks. The relative increase in the screening rates with the intervention was between 219% and 270% with the absolute increase in screening ranging from ranging between 11.4% and 16.4%.