

New York



New York Chapter
American College of Physicians

Annual Scientific Meeting

Poster Presentations

Saturday, November 5, 2022

Westchester Marriott Hotel
670 White Plains Road
Tarrytown, NY 10591

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Medical Student Clinical Vignette

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Medical Student Clinical Vignette

Lon Yin Chan

Georgina Kemeh MD, Ammar Yasser Abdulfattah MD, Khaleda Akter MD, Suzette Graham-Hill MD

SUNY Downstate

THIGH ABSCESS WITH UNUSUAL SEEDING FROM THE PROSTATE

Introduction:

Often, thigh abscesses are complications secondary to an existing infection rather than primary infections and their source is difficult to pinpoint. Current literature have reported thigh abscesses secondary to intra-abdominal infections, an existing nearby muscle abscess, an instrument (e.g. catheter, needles), and cancer.

Clinical Presentation:

57-year-old man with a past medical history of hypertension, insulin-dependent diabetes mellitus, bipolar disorder, and depression presented with three days of right thigh pain. Patient denied prior trauma or falls. Physical exam was significant for a three-centimeter firm mass of the right anterior lateral thigh with no overlying skin changes, with normal ambulation: limited knee flexion due to pain but intact extension. Initial femur radiograph showed no acute fractures/dislocation and possible calcific tendinosis. Ultrasound showed a soft tissue mass that may be a hematoma vs muscle injury vs sarcoma. Initial laboratory results were significant for leukocytosis, methicillin-susceptible *Staphylococcus aureus* (MSSA) bacteremia, and MSSA in the urine. Oxacillin treatment improved the pain for two days. However, the pain began to worsen and the mass gradually became wider with increasing warmth. A CT scan without contrast did not show any suspicious osseous or soft tissue lesion. His persistent leukocytosis and new physical exam changes warranted a CT scan with contrast of the lower extremity, which showed a intramuscular abscess within the right lateral aspect of the distal quadriceps femoris (2.2x2.7x5.1 cm) and multiple abscesses within the prostate (largest measured 3.5x2.1x3.5 cm). Lastly, a transthoracic echocardiogram showed no vegetations, ruling out thrombus as a source of infection.

Intervention:

The right lateral thigh abscess was incised and drained without complication, and the culture tested positive for *Staphylococcus aureus*. A two-week course of cefazolin was recommended.

Discussion:

The multiplicity of the prostate abscesses on CT suggest they pre-dated the thigh abscess, and thus may serve as a source. The prostate abscesses may have arisen from hematogenous seeding from another abscess, bacteremia, or acute bacterial prostatitis (approximately 6% become abscesses).

The source of the *Staphylococcus aureus* thigh abscess is either his prostate abscesses or bacteremia. The argument for seeding from prostate abscesses is not far-fetched. *Staphylococcus aureus* is an increasingly common cause of acute bacterial prostatitis. Patients with *Staphylococcus aureus* caused prostate abscess are more likely to be diabetic. Typical risk factors of prostate abscess development generally include recent prostate biopsy, benign prostate hyperplasia, or inadequately treated acute bacterial prostatitis, but our patient did not have a history of these factors. However, he does have long-standing uncontrolled diabetes mellitus (HbA1c=14.6%).

Conclusion

PubMed shows 76 reports on thigh abscesses; none of which are due to seeding from prostate abscess. Therefore, we report this case of a clinically stable patient with thigh abscess due to seeding from an uncommon source: prostate abscesses.

Medical Student Clinical Vignette

Michelle Chisdak

Syed Bukhari, MD

SUNY Upstate University Hospital

Syracuse, NY

SUNY Upstate Medical University

BIPHASIC CALCIUM DISTURBANCE FOLLOWING RHABDOMYOLYSIS-INDUCED ACUTE RENAL FAILURE IN THE SETTING OF COVID-19 INFECTION

Hypocalcemia is a common complication of rhabdomyolysis-induced acute renal failure. However, the subsequent development of hypercalcemia is a much less common complication and the exact mechanism by which hypercalcemia occurs is unknown.

A 57 year old female was admitted after 4 days of worsening back pain, weakness, fatigue, decreased urine output, and shortness of breath. She tested positive for COVID-19 at the time of her admission. Finding elevated CK levels - peaking at >77,000 U/L - a diagnosis of acute tubular necrosis secondary to rhabdomyolysis was suspected. Diagnosis was confirmed via renal biopsy, which demonstrated myoglobin cast nephropathy. The patient required ICU admission for hypotension and continuous renal replacement therapy. Initially, the patient was hypocalcemic requiring calcium gluconate with a calcium of 5.5 mg/dL at its lowest. As the patient's renal function recovered, she was transitioned to intermittent hemodialysis, eventually no longer requiring renal replacement therapy. The patient subsequently entered the polyuric phase of her kidney injury and experienced a steady increase in serum calcium levels, peaking at 11.5 mg/dL three weeks after admission. Notably, the patient was hypoalbuminemic as well, with an albumin of 1.8 g/dL three days prior to her hypercalcemic peak, suggesting her corrected calcium was even higher. The patient was polyuric at this time with over three liters of urine produced in a 24 hour period. This was presumably due to a combination of the hypercalcemia itself, as well as the continuing polyuric recovery phase. Otherwise, she remained asymptomatic and her calcium was trending downward at the time of discharge.

Rhabdomyolysis has been reported to occur as a complication of COVID-19 infection, however, development of hypercalcemia is an infrequently reported complication in the setting of COVID-19 infection. The exact mechanism of this is unknown, however it is thought to be related to mobilization of calcium back into the serum that had previously deposited in injured muscles and surrounding soft tissues. Other proposed mechanisms of hypercalcemia are secondary hyperparathyroidism and elevated 1,25 dihydroxyvitamin D. In this patient, we documented normal levels of 1,25 dihydroxyvitamin D and 25 hydroxyvitamin D, as well as a decreased intact parathyroid hormone level at the time of the hypercalcemia. This further supports the hypothesis of calcium remobilization as the principal mechanism for the development of hypercalcemia. Although this patient remained asymptomatic, it is important to monitor for biphasic calcium disturbances in rhabdomyolysis due to infectious etiologies, as the resulting hypercalcemia can be severe. Additionally, initial hypocalcemia should only be treated when the patient is symptomatic, because supplemental calcium can further contribute to the development of subsequent hypercalcemia.

Medical Student Clinical Vignette

Adam Daniels

Binyamin R Abramowitz, MD., Michelle Chen, DO., Shraddha Raghavan, MD., Suzette Graham-Hill, MD

SUNY Downstate Health Science University

The Unique Presentation of Malignancy in a Woman Failing to Lactate

Introduction:

Breast cancer has a globally significant impact on rates of cancer diagnosis and cancer-related deaths. As much as 20% of invasive breast cancers are triple negative (TNBC) with highest rates occurring in young, African-American women with more aggressive, late-staged presentations. Breast feeding has been demonstrated to serve as a protective mechanism against breast cancer development in multiparous women. However, literature is less apparent on the impact cancer can have on an actively breastfeeding mother. The patient discussed herein presented with inability to express milk from the left breast.

History of Present Illness:

A 35-year-old Black female, gravida 3 para 3, with no significant past medical history, presented three months after childbirth with an inability to express milk from the left breast without forcefully applying external pressure to the breast. She also reported that her infant was not latching to the left nipple despite repeatedly successfully latching to the right nipple. She did not endorse any pain or discomfort in the breast or axilla, nor any skin irritation or discoloration of the breast. The patient also denied any fever, chills, rigors, cough, shortness of breath, or further symptoms. She has a family history of uterine cancer in her aunt and lung cancer in her grandfather, but no breast or ovarian cancers. Physical exam at the initial presentation was pertinent for a lump at the 6 o'clock position that was confirmed with ultrasound. Histopathology of a biopsy was significant for mucinous carcinoma demonstrating a suspension of alveolar nests, trabeculae, papillary clusters, and epithelial clumps in extracellular mucin. The cancer was determined to be negative for HER2, progesterone receptor, and estrogen receptor. Following biopsy, there was rapidly progressive deterioration of the areola, nipple, and superficial breast tissues resulting in complete effacement of the previously normal appearing breast. Computed tomography (CT) demonstrated a heterogenous soft tissue mass in the left breast and concurrent inflammatory changes with skin thickening and surrounding fat infiltration all consistent with her previous diagnosis. CT also demonstrated bilateral axillary lymphadenopathy and a pulmonary nodule in the right upper lobe both supporting a picture of metastases. Further imaging revealed a lytic lesion with sclerotic borders in the right greater trochanter.

Discussion:

Triple negative breast cancer is a rapidly progressive cancer that disproportionately affects Black and African-American women. The patient discussed in this report exemplifies a presentation in which there were no symptoms suggestive of the development of breast cancer beyond inability to express milk. Medical literature is lacking on such a unique presentation of breast cancer discovered secondary to failure to lactate. Healthcare providers should be cognizant of the potential for asymptomatic triple negative breast cancer in a post-partum patient failing to lactate.

Medical Student Clinical Vignette

Sophie Eldred

Sophie Eldred,(1) Eliyakim Hershkop M.D.,(2) Soe Winn M.B.B.S.,(2) William Pascal M.D.(2)

(1)SUNY Downstate College of Medicine, Brooklyn, New York

(2)Maimonides Medical Center Department of Internal Medicine, Brooklyn, New York

SUNY Downstate College of Medicine

RENAL CALYX RUPTURE SECONDARY TO NEUROGENIC BLADDER

Introduction:

Renal calyx rupture is a rare condition that occurs most commonly due to ureteral obstruction. We report a unique case of a ruptured renal calyx secondary to neurogenic bladder in a patient with spina bifida (SB).

Case:

A 36-year-old male with a history of SB, paraplegia, and neurogenic bladder requiring daily self-catheterization presented to the ED with three days of vomiting and abdominal distention. He was hemodynamically stable and afebrile. He lacks motor function and sensation of lower extremities as well as urinary and bowel control. Physical examination was notable for abdominal distention and mild tenderness to palpation.

Laboratory testing was notable for BUN of 69.2 mg/dL, creatinine of 1.7 mg/dL, leukocytosis of 42,000/mm³, and lactate of 9.1 mmol/L.

CT imaging revealed perforation of a markedly dilated right calyceal system resulting in a large amount of retroperitoneal fluid and gas, as well as severe renal atrophy with hydronephrosis. He also had moderate left hydronephrosis without renal atrophy. There was marked bladder wall thickening, likely due to neurogenic bladder. No nephrolithiasis was present.

He was admitted for sepsis secondary to calyceal rupture with AKI, and was started on broad spectrum antibiotics. Since he was hemodynamically stable, he did not require acute surgical intervention and a more conservative approach was preferred. It was presumed that the calyceal rupture was caused by high urinary tract pressure from the dysfunctional bladder and persistent reflux. A foley catheter was placed to alleviate the pressure. An IR guided pigtail catheter was placed in the retroperitoneal collection for adequate drainage.

Cultures of his blood and drainage catheter both grew *Escherichia coli*. Urine cultures grew *Providencia rettgeri* and *Trueperella bernardiae*. Antibiotics were adjusted accordingly. Sepsis and AKI resolved. A repeat CT after eight days revealed decreased dilation of the right calyceal system, but persistent hydronephrosis and retroperitoneal gas and fluid collection. IR placed a percutaneous nephrostomy tube for urinary diversion. At the time of this report, the patient remains hospitalized receiving IV antibiotics with the guidance of consulting services.

Discussion:

Renal calyx rupture is a rare condition that can occur when ureter pressure exceeds 25-75mmHg. Few cases are documented, and most are secondary to ureteric calculi. Other causes include malignancy, pregnancy, posterior urethral valves, and iatrogenic trauma.² To our knowledge, this is the first documented case of renal calyceal rupture due to neurogenic bladder. Upper urinary tract rupture from dysfunctional voiding most often occurs at the ureter rather than the calyx. Two other cases of renal calyceal rupture from dysfunctional voiding were identified in the literature, one from BPH and the other from maggots inserted into the urethra. Physicians should be aware of the potential for renal calyx rupture in patients with neurogenic bladder.

Medical Student Clinical Vignette

Anna Fagbemi

Vitaly Adler, MD

Abdulrasheed Akande, MD

CUNY SCHOOL OF MEDICINE

MASTOIDITIS TO PURULENT PERICARDITIS

Purulent Pericarditis characterized by macroscopic or microscopic (>20 leukocytes per oil immersion field) evidence of pus in the pericardial space is a rarely encountered condition especially in this era of widespread use of antibiotics and makes it a diagnostic challenge in many cases.

36-year-old male with recent History of right otitis media and mastoiditis presented to the ED with right-sided chest pain and night sweats of 3 weeks duration. Triage vitals shows tachycardia with pulse of 134/min, Temp of 98.7 °F, otherwise within normal. Initial Pain was non-radiating and relieved by sitting up. He had productive cough with yellow sputum, fever, chills, and night sweats associated also with intermittent non-bilious vomiting, fatigue, and unintentional weight loss of 20 lbs. over 3 weeks. Social history positive for alcohol use disorder, and 10-pack-years of smoking. Examination revealed cachectic male, with hyperemic right tympanic membrane along with middle ear effusion. Chest exam revealed decreased air entry on the right side, tachycardia. Labs: leukocytosis of 42,000 cmm, hyponatremia, azotemia with BUN of 93 mg/dL and creatinine of 4.5mg/dL. COVID-19, Legionella test were negative. EKG showed sinus tachycardia occasional PVCs, T wave inversion in lateral leads and prolonged QTc. CXR revealed dense consolidation in lateral segment of right middle lobe associated with right pleural effusion, while Chest CT showed pericardial effusion along with right-sided Pneumonia and effusion. CT of mastoid revealed fluid in right mastoid air cells but no fracture or deformities. Initial impression was severe sepsis, pneumonia R/o TB and malignancy.

Admitted to MICU with critical care and pulmonary consults

Treatment: IV-Fluids, antibiotics Vancomycin, cefepime and Azithromycin but later changed to Ceftriaxone and Vancomycin with ID consultation. His hospital course and test revealed AFB negative x3, HIV test positive with CD4 count of 80 cells/mm³ and viral load of 54, 500 copies/mL. Syphilis, GC/ Chlamydia tests and autoimmune work up were negative. Patient declined bronchoscopy, BAL, and transbronchial biopsy. ECHO showed large pericardial effusion, Ejection-Fraction of 70%, paradoxical septal motion, diastolic right heart collapse with collapsed IVC consistent with pericardial tamponade but no vegetations hence urgent pericardiocentesis with removal of 570 cc of purulent fluid and pericardial drain with daily output of 150cc purulent effluent growing strep Pneumoniae. Patient improved with treatment and stepped down to regular medical unit.

Case illustrates the need for a high index of suspicion and early recognition of this rapidly progressive infection with high mortality which accounts for less than 1% of pericarditis cases especially in a patient with risk factors such as immunosuppression (AIDS, Alcohol use disorder, chronic kidney disease), along with associated infections such as pneumonia, pleural empyema and sepsis that allow for both direct intrathoracic and hematogenous spread hence avoiding delayed diagnosis and timely intervention.

Medical Student Clinical Vignette

Katherine Ferra Pradas

Stony Brook University

Medication Myx-Up: A Rare Case of Amiodarone-Induced Myxedema Coma

A 90-year-old male presents to the emergency department after an episode of significant weakness and shortness of breath that caused him to collapse. He did not lose consciousness or hit his head.

The patient has been feeling progressively weaker and short of breath since he was found to have new onset CHF secondary to transthyretin (ATTR) amyloidosis and AF/AFL for which he began Amiodarone 200 mg BID. Since then, he had worsening energy levels and shortness of breath. He was also sleeping more than usual, noted to be unusually cold by his wife, and went from playing golf 3 times a week to struggling to reach his upstairs bedroom due to weakness and shortness of breath.

On admission his temperature was 93.6F, pulse 47, respiratory rate 18, blood pressure 97/51, and SpO₂ was 97% on 6 L nasal canula. On physical exam, he was obtunded, cold to touch and diaphoretic. Crackles were heard halfway up his lungs bilaterally. TSH was 124, free thyroxine 0.83, cortisol 24, and pro-BNP 4862. EKG showed normal sinus rhythm. His TSH before starting Amiodarone was 5.

He was treated for Amiodarone-induced myxedema coma precipitating acute decompensated heart failure (AHDF) with IV levothyroxine, IV hydrocortisone and IV furosemide. The patient had a marked improvement in lethargy and vitals in the next few hours and was alert and speaking the next morning.

Amiodarone-induced myxedema coma is exceedingly rare, with mortality rates as high as 30-60%. The proposed mechanism is failure to escape the Wolff-Chaikoff effect induced by Amiodarone's high iodine content and is more likely to occur when there is underlying thyroid dysfunction. Histopathological studies of patients with ATTR amyloidosis have demonstrated the thyroid to be a major target. Therefore, patients on Amiodarone that have infiltrative disease should be closely monitored for hypothyroidism due to potential subclinical thyroid disease from protein deposition that may make them susceptible to deadly Amiodarone-induced myxedema coma.

Medical Student Clinical Vignette

Francesca Norko

Jacqueline Nikakis, Ermin Tale, Sarah Jane Muder, William Blazey DO, Todd J. Cohen MD

New York Institute of Technology College of Osteopathic Medicine

Lessons from a transgender patient with an ICD: The importance of gender-affirming hormone therapy disclosure

Introduction:

Over 1.6 million people in the United States currently identify as transgender. Often transgender women take estrogen-progestin combination gender-affirming hormone therapy (GAHT) with or without the guidance of a licensed medical provider. Limited research has been done studying the effects estrogen has on the cardiovascular system in transgender women.

Case Description:

In 2010, a 58-year-old male (sex assigned at birth) presented to the hospital following resuscitation for cardiac arrest [ventricular fibrillation (VF), ventricular tachycardia (VT)]. Following stabilization, the patient underwent a cardiac work-up which identified non-ischemic cardiomyopathy, and a single-chamber implantable cardioverter defibrillator (ICD) was inserted.

Between 2010-2018, the patient developed drug-refractory atrial fibrillation (AF) and was prescribed warfarin for stroke prevention. Because of the presence of an aortic aneurysm, the patient underwent an atrioventricular junction ablation for rate control. The patient subsequently became pacemaker dependent (100 percent ventricular-paced). Despite optimal medical therapy (metoprolol, ramipril, furosemide, and spironolactone) the patient was diagnosed with NYHA Class III Congestive Heart Failure and received an upgrade to a cardiac resynchronization therapy defibrillator.

In April 2018, the patient began transitioning from male-to-female without informing medical providers by self-medicating for 6 months with phytoestrogen before switching to estradiol:spironolactone (2:100mg) purchased online. In April 2019, the patient was formally prescribed estradiol (2mg) and additional spironolactone (100mg) by another provider.

In February 2020, while taking prescribed GAHT unknown to our team, she experienced VF and was defibrillated by her ICD. One month later, she experienced another episode of VF and was again successfully treated by her device.

Upon informing us that she started GAHT in February 2021, the patient was more frequently monitored and given additional emotional support. Heart failure medications were adjusted, including spironolactone dose decreased. As of August 2022, we report no episodes of VF and successful vocal cord surgery with plans for further gender-affirming surgeries.

Discussion:

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This case highlights the importance of early GAHT disclosure in cardiac patients transitioning as little data exists in the older adult population. Some studies note an increase in cardiovascular risk factors leading to thrombotic stroke, myocardial infarctions, and arrhythmias in comparison to cis-women.

If her medical providers knew that she was taking GAHT, estrogen may have been administered trans-dermally to bypass first-pass metabolism and prevent interaction with warfarin, reducing the risk of thromboembolic events. Early disclosure could have potentially prevented two life-threatening VF episodes requiring ICD treatment. Additional early considerations would have included antiarrhythmic medications, substrate ablation for VF, and polypharmacy management.

Current research lacks information on the impact of patient age when initiating GAHT, and its effects on cardiovascular health. Improved doctor-patient relationships may encourage early disclosure by these patients and prevent subsequent cardiac events through proper adjustments in their plan of care.

Medical Student Clinical Vignette

Phil Shin

Phoebe Kahn, MD

Columbia University Irving Medical Center

Hypereosinophilic Syndrome Flare without Peripheral Eosinophilia

Hypereosinophilic syndrome is a rare but potentially life-threatening disease characterized by eosinophilia that may result in end-organ damage to multiple systems, most commonly involving the lungs, gastrointestinal tract, and skin. When patients experience exacerbations of hypereosinophilic syndrome, the diagnosis has always relied on eosinophilia in the blood and peripheral tissue. Here we report an occurrence of hypereosinophilic syndrome flare without associated peripheral eosinophilia.

A 57-year-old man presented to the hospital with a chief complaint of shortness of breath, cough, odynophagia, and diarrhea. He had a known history of hypereosinophilic syndrome involving the pulmonary and gastrointestinal systems. He had two recent hospitalizations in the prior eight months with similar symptoms of dyspnea, hypoxemia, and diarrhea. During these hospitalizations, he was found to have pulmonary infiltrates, peripheral eosinophilia (5,000 - 6,000 cells/ $\times 10^6$ L), and bronchoalveolar lavage (BAL) cell count with 63% eosinophils. Both previous presentations promptly resolved with corticosteroids and were presumed to be flares caused by hypereosinophilic syndrome. He was continued on an extended corticosteroid taper and was started on mepolizumab, an anti-interleukin-5 monoclonal antibody that reduces the production and survival of eosinophils.

While this current presentation of pulmonary and gastrointestinal symptoms was nearly identical to his two prior hospitalizations, laboratory studies revealed no peripheral eosinophilia (90 cells/ $\times 10^6$ L, 1.9%). Thus, immunosuppression was not increased and instead, broad spectrum antibiotics were started. However, due to lack of improvement over three days, he underwent computed tomography of his chest showing pulmonary opacities similar to his prior eosinophilic pneumonia episodes and bronchoscopy with BAL cell count showing 15% eosinophils. Additionally, upper endoscopy revealed findings consistent with eosinophilic esophagitis. Later in his hospital course, given these imaging findings and a persistent lack of improvement on antibiotics, his corticosteroids were uptitrated, which resulted in resolution of all pulmonary and gastrointestinal symptoms within two days.

This case illustrates an interesting clinical occurrence where a flare of hypereosinophilic syndrome occurred despite a lack of peripheral eosinophilia. This could create challenges in the clinical decision-making between antibiotic coverage or immunosuppression in the treatment for flares of hypereosinophilic syndrome. Overall, while effective medical therapy for hypereosinophilic flares exist, this case illustrates the challenges with prevention and diagnosis of these flares

Medical Student Clinical Vignette

Devin Videlefsky

Constangela Matos Noboa, M.D.

Charu Ramchandani, M.D.

Montefiore Medical Center, Albert Einstein College of Medicine

IT'S A CHANCROID, IT'S A HEART ATTACK, IT'S MONKEYPOX?

Purpose:

The 2022 Monkeypox outbreak, which was first confirmed in May 2022, has claimed 6,000 lives and has been declared a public health emergency by the World Health Organization. During the current outbreak in the United States, patients' symptoms and disease course have deviated from the typical presentation, making the diagnosis more challenging. Herein, we report a case of two male Human Immunodeficiency Virus positive individuals in a monogamous relationship, who both had atypical presentations of Monkeypox.

Case presentation:

Patient A presented with 5 days of sore throat, fever, myalgias, and intermittent pleuritic chest pain. He is on Antiretroviral Therapy (ART) with CD4 Count 1,171 cells/uL. He endorsed progressively worsening truncal rash, groin pain, and penile discharge for 3 days. Physical exam showed erythematous, non-pruritic, non-tender nodular rash on chest, back, trunk, and extremities with small discrete lesions. Genital exam showed a painless skin colored papule on tip of glans penis, a painful erythematous ulcer on the dorsal aspect of the glans penis, whitish penile discharge, and bilateral painful inguinal lymphadenopathy. Laboratory tests were notable for an elevated Troponin-I of 0.38 ng/mL.

Patient B is also on ART with CD4 count of 667 cells/uL presented with similar flu-like symptoms for 4 days and constant, non-radiating, dull, left sided groin pain and rectal pain for 2 days. There was no rash or discharge. Patient B's laboratory results were also significant for an elevated Troponin-I. Two days after admission, Patient B developed two skin lesions similar to his partner, on his forearm and foot.

Following a negative cardiac work up and down-trending troponins, the elevated troponins were likely demand ischemia in the setting of infection. Penile and rectal swabs for Monkeypox and common sexually transmitted infections were obtained. Both patients tested positive for Herpes Simplex Virus-2 and were treated with Valacyclovir. With this test result, and improvement in symptoms, Monkeypox was considered unlikely and both patients were discharged home. Following a two-week turnaround, the Monkeypox PCR tests for both patients resulted as positive. Follow up communication revealed resolution of symptoms, with skin lesions having scabbed over and fallen off.

Discussion:

Monkeypox patients can present with febrile prodrome before rash appears. Co-infections with Monkeypox are not uncommon. High index of suspicion should be maintained especially in patients with HIV who are at increased risk of severe disease.

Conclusion:

This case illustrates the potential risk of disregarding a possible Monkeypox infection in the presence of a positive, more common sexually transmitted infection, as these patients can be co-infected with Monkeypox. It also showed two very atypical presentations for Monkeypox in patients with HIV, not following classic cutaneous evolution patterns, and both complicated by elevated troponins.

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Medical Student Research

Christopher Alessandro

Menachem Jacobs

Ruoyu Luie Wang

Avraham Karp

Marc Ganz

Aaron E Glatt

Israel Zyskind

SUNY Downstate Medical Center

Efficacy of Booster Shots for an Unforeseen SARS-CoV-2 Strain

Background: SARS-CoV-2 is a rapidly evolving virus, with many strains. Although vaccines have proven to be effective against earlier strains of the virus, the efficacy of vaccines and boosters against later strains of the virus, such as Omicron, is still an area of active research.

Objective: To determine if vaccination status was associated with symptomatology due to infection by Omicron.

Design, Setting, and Participants: Cross-sectional surveys were sent to 14,714 Jewish adults throughout New York City from December 2021 to March 2022, during initial prominence of the Omicron variant. Subjects were recruited by local Jewish not-for-profit and social service organizations. Only participants who received a positive COVID nasal swab within ten weeks since December 1st, 2021 were included in the main outcome.

Exposure: Participants were grouped by vaccine type (i.e., Johnson and Johnson, Moderna, or Pfizer) and vaccination status (i.e., unvaccinated, single, full, or booster).

Main Outcomes and Measures: The primary study outcome was association between immunization status and symptomatic presentation. Symptom severity classes were built using latent class analysis (LCA).

Results: 1,020 of the 14,714 individuals began the survey process (6.93% response rate). 966 of these individuals completed the survey for an overall completion rate of 6.57%. The participants were mainly self-described Ashkenazi Jewish (97%) with a median age of 41. The most commonly reported symptoms were fatigue (64.7%), followed by cough (53.1%), sore throat (46.9%), and aches (45.1%). Symptoms persisted for an average of 5.29 days (SD 3.41). 609 (63.0%) of the 966 respondents received at least one vaccination. 584 (95.9%) of the 609 vaccinated participants received their "full" (two dose mRNA) vaccination series, and 246 (42.1%) of these 584 fully vaccinated respondents received "booster" doses of mRNA vaccine. LCA resulted in four classes: Highly Symptomatic, Less Symptomatic, Anosmia, and Asymptomatic. Vaccinated participants were less likely to be in symptomatic groups than the unvaccinated participants (OR= .326 ; 95% CI= .157, .679; p=.002). Boosted participants were less likely to be in symptomatic groups than fully vaccinated participants (OR=.267; 95% CI =.122, .626; p=.002). Additionally, there was no association between symptomatology and vaccination type (p=.353).

Conclusions and Relevance: Participants who received a COVID vaccination or booster shot were less likely to be in greater symptomatic groups after Omicron infection compared to unvaccinated and fully vaccinated participants, respectively. Additionally, there was no association between vaccination type and symptomatology. The results highlight the protective effect of vaccinations, while enhancing the current understanding of the benefits associated with vaccination and booster status in evolving COVID strains.

Medical Student Research

Denisa Costea

Denisa Costea, DO Candidate - Touro College of Osteopathic Medicine

Dr. Jeannette Beasley, MPH, PhD - NYU Department of Medicine

Dr. Emily Johnston, MPH, PhD - NYU Department of Medicine

Dr. Joshua Chodosh, MD - NYU Department of Medicine

Heidi Hartmann-Rothe, RN CDE MS in Diabetes Education and Management - NYU Department of Medicine

NYU Department of Medicine

Adapting The Diabetes Prevention Program (DPP) for Older Adults

Medical Student/Author: Denisa Costea, DO Candidate

PI: Dr. Jeannette Beasley, MD, PhD

Adapting The Diabetes Prevention Program for Older Adults

Background: Prediabetes affects 26.5 million people (48.8%) aged 65 or older. The Diabetes Prevention Program (DPP) is a year-long program designed to prevent/delay type 2 diabetes in predisposed people. Participants are encouraged to make lasting lifestyle changes like eating healthier and being physically active. Although older adults respond well to the DPP, they are a heterogenous group with differing physiological, biomedical, and psychosocial needs that can benefit from additional supports to accommodate age-related changes in sensory and motor function.

Objectives:

- 1) To describe modifications made for the BRIDGE initiative, an adaptation of the CDC's DPP aimed at preventing diabetes amongst older adults (ages 65+).
- 2) To pilot two virtual sessions of the adapted DPP via AARP's Senior Planet platform and evaluate acceptability of the content.

Hypothesis: Our hypothesis is that participants will find the pilot sessions acceptable and will report the information is useful to them through survey results.

Methods: After evaluation of the DPP curriculum and review of relevant literature, the study team adapted the DPP by incorporating additional resources necessary for older adults and modifying some of the session content. Adaptations of the DPP included an expansion of resources available for the topics/ modules of physical activity, nutrition, calorie balance, emotional support, visual impairment, and hearing impairment. Then, a certified lifestyle coach delivered two sessions of the adapted content via Zoom to a group of older adults. After delivery of two adapted sessions (Session 7 "Energy In, Energy Out" and Session 20 "Shop and Cook to Prevent Type 2 Diabetes"), we administered surveys to measure acceptability and usability of the materials via REDCap.

Results: The pilot sessions were attended by 189 older adults. The first session (n=109) had a 35% response rate to the survey, while the second (n=88) had a 38% response rate. The survey assessed acceptability, feasibility, and intention to change behavior. Evaluating acceptability, 68% of respondents strongly agreed that they liked the program, with 62% agreeing they would recommend it to a family member or a friend. The group discussions were identified as very relevant by 63% of participants, and the videos used by 61% of them.

Discussion: Participation in the survey was low <40%, but respondents rated the content favorably. This data will be used to inform intervention delivery in the BRIDGE randomized, controlled trial.

Medical Student Research

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Daniel Gulko

Jacqueline Kenitz , Gregory Petrossian, George Tawfellos, Christina Beegle, Mikhail Torosoff

Albany Medical College

Baroreceptor Dysregulation as a Marker of Disease Severity in Congestive Heart Failure (CHF)

Congestive heart failure (CHF) accounts for 1 in every 9 deaths with nearly 1 million admissions every year and 22% of readmissions within 30 days. Cardinal manifestation of CHF is exertional dyspnea, which is a foundation of the NYHA CHF classifications. However, the qualitative character of NYHA CHF classes does not lend itself to a precise assessment of daily changes in CHF status. Current tools to assess CHF — including echocardiography, chest radiography, and brain natriuretic peptide testing — are costly, complex, and cannot be easily repeated daily.

To see if simpler, inexpensive methods could be used to assess CHF disease severity, this study assessed the clinical/prognostic significance of using self-administered bedside baroreceptor and breathing testing.

Baroreceptor status was quantified with breath holding test (BHT), examining breath holding duration, and the lowest heart rate (HR) recorded during BHT. Inability to speak in full sentences, one of the classic descriptors of CHF, was quantified with the novel highest counted number (HCN) test, by determining how high a patient could count in a single breath starting at 21.

A total of 119 patients were enrolled (67.7 ± 14.6 years of age for NYHA Class I-II, 69.4 ± 14.3 for NYHA Class III, and 66.8 ± 13.8 for NYHA Class IV). Age, HR change with breath holding, BMI, LV ejection fraction, total length of stay, length of stay post-study testing, gender, smoking history, pulmonary hypertension, connective tissue disease, hemodialysis, diabetes, embolic stroke, atrial fibrillation, coronary artery disease, and hypertension were not found to be statistically significant relating to NYHA Classes. As such, most groups were similar in terms of comorbidities, except for COPD/asthma history, which was more common in patients with CHF classes III and IV, $p=0.026$. Resting HR was significantly higher in patients with more advanced CHF, $p=0.029$. Furthermore, breath holding duration progressively decreased as CHF severity increased, $p<0.005$. During BHT, expected decrease in the HR was attenuated and less pronounced in patients with advanced CHF and in patients with history of COPD or asthma, $p<0.005$. Average HCN became progressively lower as CHF severity increased, $p<0.005$.

Consistent with down regulation of the baroreceptor function in CHF, we found that Class I and II CHF patients were able to hold their breath longer with lower HR, while Class III and IV CHF displayed opposite trends. Our findings are biologically plausible and consistent with pathophysiology of CHF. Our results indicate that simple bedside self-administered tests may be utilized to quantify respiratory difficulties common in CHF and in pulmonary diseases. BHT and HCN tests can prove extremely useful as easy, timesaving, and inexpensive diagnostic tools to aid in early diagnosis, evaluation, and in daily assessment of CHF status.

Medical Student Research

Daniel Kaufman

Y. F. Tehrani¹, F. Bruno^{1,2}, L. H. Degani-Costa³, F. Gushken³, C. Szlejf³, A. B.

P. Tokeshi⁴, K. K. L. Prasad⁴, P. S. S. Kumar⁴, L. Jamir⁵, M. G. K. Benesch⁶, M. G. Ryan⁶, H. S. Lotay⁷, J. P. Fuld⁷, T. M. Fidalgo³

Touro College of Osteopathic Medicine

E-CIGARETTES AND HOOKAH USE AMONG MEDICAL TRAINEES

Introduction:

The increased prevalence of alternative tobacco products like electronic cigarettes and hookah has raised public health concerns, especially among younger consumers. As young adults, medical trainees are also part of high-risk population. have an abundance of information and wealth of knowledge on the negative health impacts of vaping, they remain one of the highest risk populations to experiment with vaping. Understanding the prevalence of these devices among medical trainees and associated factors that lead to their usage can provide valuable information to prevent the use of these devices among future physicians. Our study aimed to investigate the frequency and patterns of use of e-cigarettes and hookah among medical trainees (medical students, residents, and fellows).

Methods:

We established a cross-sectional international survey-based study of medical trainees in the United States (US), Brazil (BR), and India (IN). Recruitment for the online survey was carried between October 2020 and November 2021. Medical trainees answered a 72 multiple-choice questionnaire on REDCap pertaining to their socio-demographic and mental profile, medical training level, and personal experiences on the use of e-cigarettes and hookah.

Results:

We enrolled a total of eligible 7,526 respondents (US = 3,067, BR = 3,093, IN = 1,366). Regarding e-cigarette usage, 47% (US), 44% (BR), and 4% (IN) of trainees tried vaping (ex-users: 24%, 7 %, and 1%; current users: 11%, 20%, and 0%, respectively for US, BR and IN). The median age at first use was 21y in the US and 20y in BR. For vaping content, 69% vaped nicotine, 50% flavors, and 23% cannabis. As for hookah, 37% 47%, and 8% of trainees in US, BR, and IN tried it (ex-users: 19%, 16%, and 4%; current users: 6%, 10%, and 1%). The median age at first use was 20y in the US and 17y in BR. Regarding hookah contents, 55% smoked tobacco, 60% flavors, and 22% cannabis. Higher family income, smoking cigarettes and marijuana, and binge drinking were associated with e-cigarette and hookah use among senior students. Residents showed similar results.

Conclusions:

E-cigarettes and hookah use were frequent among medical trainees in the US and Brazil, which sharply contrasted with the low prevalence in India. Cultural aspects and public health policies may play a role in explaining the differences among countries, but government policies alone may not fully explain the differences, as e-cigarettes are banned in Brazil and India. Addressing the problems of hookah and e-cigarette smoking in this population should be considered paramount to avoid the renormalization of smoking.

Medical Student Research

Ali Lahooti

Amier Hassan 1, Brian Critelli 1, Sonal Kumar M.D.1, Carolyn Newberry M.D.1, Reem Z. Sharaiha M.D.1

1: Division of Gastroenterology and Hepatology, Weill Cornell Medicine, New York-Presbyterian Hospital, New York, New York

Weill Cornell Medical College

QUALITY AND POPULARITY TRENDS OF WEIGHT LOSS PROCEDURE VIDEOS ON TIKTOK

Background: The use of social media as a patient information tool parallels the rising incidence of obesity and body-esteem concerns. TikTok, the popular video-sharing platform, currently boasts 1.3 billion users. Notably, the hashtag “weightloss” has been tagged in nearly 99,000 videos amassing over 58 billion views. Previous studies have analyzed the quality of patient education information on TikTok in other areas of medicine. However, the quality of videos regarding weight-loss procedures has not yet been determined.

Purpose: The aim of this study was to analyze the source, quality, and popularity of videos referencing three weight-loss procedures on TikTok.

Methods: Hashtags encompassing three weight-loss modalities of interest— “gastricsleeve,” “gastricsleevesurgery,” “vsg,” “vsgcommunity,” “rny,” “rnycommunity,” “gastricbypassurgery,” “gastricbypass,” “endoscopiesleeve,” and “endoscopiesleevegastroplasty”—were entered into TikTok’s search algorithm and yielded over 3000 videos. The first 50 videos meeting inclusion criteria for each weight-loss modality were considered. Duplicated videos, non-English language videos, and videos without audio or visual explanation were excluded. Two independent reviewers, AL and AH, analyzed video content and descriptions to categorize and score each video using DISCERN, a validated tool assessing the quality of consumer health information. The grade of each video was averaged between the two reviewers. Disputes regarding video categorization were resolved by a third independent reviewer, RZS. Quality scores and popularity, recorded as views per day, were compared between videos produced by physician and non-physician creators. These metrics were also compared between modalities and content categories.

Results: One hundred fifty videos, collectively viewed over 105 million times, were included in the analysis. Only 20.7% of videos were created by physicians versus 79.3% by non-physicians ($P<0.001$). The average DISCERN score for physician-created content (41.4) was significantly higher than that of non-physicians (29.0) ($P<0.001$), despite significantly less popularity ($P<0.002$). Further, the 50 most popular videos had significantly lower DISCERN scores than the 50 least popular ($P<0.02$). The average DISCERN score for videos related to endoscopic sleeve gastroplasty (ESG) were significantly higher than videos related to Roux-en-Y gastric bypass (RYGB) and vertical sleeve gastrectomy (VSG), though VSG-related videos were significantly more popular than those related to RYGB and ESG ($P<0.001$ and $P<0.001$, respectively). Across all weight-loss modalities, educational videos (38.2) had significantly higher DISCERN scores than weight-loss transformation (28.5) and personal experience videos (29.0) ($P<0.001$). Popularity differences across content categories were not significant.

Conclusion: Given TikTok’s proliferation, assessment of its content is essential for understanding the application’s impact as a patient information tool. Our results show that videos related to weight-loss procedures are poor, and that greater popularity trends with lower quality. Though creators produce content at their discretion, critical appraisal of content can encourage viewers to seek more accurate information and allow providers to develop more engaging patient information tools.

Medical Student Research

Michael McCartin

Guanghao Sun, PhD;; Qiaosheng Zhang, PhD; Zhe Chen, PhD; Germaine Cuff, PhD; Jing Wang, MD PhD (NYU)

NYU Langone

A Multi-region Neural Interface Provides Analgesia

CONTEXT/BACKGROUND:

Pain is a subjective experience, interpreted by several different but interconnected brain regions. Current pain management relies heavily on pharmaceutical therapy which often results in under or over treatment. Temporal control of pain symptoms is difficult to achieve by these means, often leading to reliance and subsequent dependence on prescription medications such as opiates.

OBJECTIVE:

We propose a non-pharmacological brain-machine-interface (BMI) to detect pain in real time and deliver endogenous pain relief. Our closed-loop system accurately detects pain onset and simultaneously activates the brain's own analgesic mechanisms to produce pain relief in rodent models.

METHODS:

The research protocol was approved by NYU IRB and IACUC. Previous studies have demonstrated that brain regions such as primary somatosensory cortex (S1) and anterior cingulate cortex (ACC) are responsible for encoding sensory and affective components of the pain experience. Stimulation of the prefrontal cortex (PFC) is also known to produce pain relief in a top-down manner. Considering current understanding of neural pain circuitry, we designed a BMI that measures local field potentials (LFPs) in the ACC and S1 to detect pain and activates PFC via optogenetic or deep brain stimulation to drive pain relief in freely behaving rodents. Animal models simulated both acute pain conditions as well as chronic pain states.

RESULTS:

Our BMI accurately detected and treated acute evoked pain as well as spontaneous pain episodes associated with chronic pain states. True positive detection rate can exceed 80% while keeping false positive detections below 10%. Behavior experiments demonstrated rats preferred chambers where BMI was paired with noxious stimuli over chambers where BMI was either absent or activated randomly.

CONCLUSION:

BMI is an accurate and reliable means for detecting real-time pain onset in freely behaving animal models of acute and chronic pain. Closed-loop systems simultaneously deliver therapy and achieve pain relief. Our technology has the potential for clinical translation in the form of EEG driven closed-loop BMI.

Medical Student Research

Priya Nair

Chase Yuan MBE, Christine Jacob BA, Natalia Lowry MD

Albany Medical College

Evaluating the Impact of the Covid-19 Pandemic on First-Year Medical Student Nutrition

Introduction:

The relationship between high stress environments and increases in unhealthy dietary and poor lifestyle habits is well known. This correlation is particularly evident in medicine, where physicians working long hours often resort to fast food for sustenance, or skip meals altogether. Although medical students are learning to be the ambassadors for nutrition to their patients, the stress of medical school tends to lead to unhealthy or less-healthy nutrition choices. With the onset of virtual learning during the pandemic, students' stressors changed as well as their adaptations to these changes. Our study evaluates how medical students' nutrition changed as a result of the Covid-19 pandemic.

Methods:

As a requirement of the Nutrition I longitudinal course, all first-year medical students (MS1s) at Albany Medical College (AMC) are required to submit a 3-day food and activity log. Data was extracted from 445 students across years 2018-2022. Each food item listed was recorded, along with a breakdown of total calories, carbohydrates, lipids, protein, sodium, calcium, vitamin D, caffeine, alcohol, exercise, and takeout meals.

Results:

Pre-pandemic (2018-19) was compared to post-pandemic (2020-21) food intake. Overall caloric intake decreased significantly in the post-pandemic years, with average intake decreasing from 1829 Cal to 1754 Cal ($p < 0.05$), which is below the recommended daily values of 2000. Overall carbohydrate intake was the principal contributor to this caloric decrease; carbohydrate intake significantly decreased post-pandemic compared to pre-pandemic. A significant micronutrient consumption decrease was also observed pre vs post-pandemic, notable for sodium, vitamin D, and calcium. Furthermore, alcohol intake significantly decreased pre vs post-pandemic.

Discussion:

The Covid-19 pandemic had a profound effect on the eating patterns of medical students. The decrease in caloric intake primarily driven by the decrease in carbohydrate intake indicates a possible shift towards restrictive eating. Caloric intake of female students in the post-pandemic years was significantly below the recommended values suggesting a gender disparity as well. Previous studies suggested vitamin D levels were already decreasing pre-pandemic, and our study suggests that it was reduced further by the pandemic. In 2020-21 the students consumed 203 IU Vitamin D each day, which is well below the recommended value of 600 IU. This decrease is concerning because of the role of vitamin D in bone density, serum calcium, and serum phosphate regulation. The decrease in alcohol consumption is encouraging as it may suggest students explored alternative methods of stress management and recreation during the pandemic. Further data needs to be collected on trends regarding other vitamins and minerals, as well as information to determine the etiology behind pre vs post-pandemic differences and trends.

Siddhartha Sahai

Megan Gupta, Jared King DO, Gary Volkell DO, Paul Feustel PhD, Eric Molho MD

Albany Medical College**Predicting long-term outcomes of DBS in Parkinson disease patients based on pre-operative risk**

There is a fundamental lack of prognostic data regarding long term outcomes for Parkinson disease (PD) patients undergoing deep brain stimulation (DBS) therapy. While DBS is established as effective for motor symptoms in PD, the majority of data published on DBS outcomes have been collected within a five-year postoperative period. During this time, DBS usually remains effective but little data exists on outcomes of patients beyond this period. With the sparsity of data available on long-term outcomes following DBS surgery, clinicians are unable to reliably predict how the patient's disease will continue to progress. The creation of a risk stratification model would aid clinicians in counseling patients considering DBS surgery what to expect as their disease progresses postoperatively. In this study, we sought to determine if a standardized cognitive and behavioral risk stratification derived from the preoperative neuropsychiatric assessment is predictive of long-term outcomes after DBS surgery. 86 PD patients who underwent neuropsychiatric evaluation and subsequent DBS surgery were assessed over a period of 5-10 years for how long it took to develop meaningful outcome milestones that were indicative of disease progression, including mortality, dementia onset, nursing home/assisted living placement, loss of independence in activities of daily living, and ambulatory status. The time to these outcomes was compared against patients' cognitive and behavioral risk scores from their preoperative evaluation to determine whether a relationship exists between risk score severity and rapidity of disease progression. Our results indicate that patients with higher preoperative risk scores in both cognitive and behavioral domains tend to reach progression milestones faster than patients with lower risk scores. Onset of dementia, in particular, is significantly associated with higher preoperative cognitive risk scores ($p = 0.02$), and patients exhibiting higher risk in both cognitive and behavioral domains were significantly more likely to develop dementia than those with heightened risk in only one or neither domain ($p = 0.011$). In summary, preoperative cognitive and behavioral disturbances are predictive of long-term outcomes and faster disease progression. Use of a cognitive/behavioral risk stratification model in the clinic may be helpful in determining operative suitability for DBS in PD.

Medical Student Research

Andrew Skomra

Kyle Waisanen M.D.

University at Buffalo Jacobs School of Medicine

Retirement Planning in the Post-COVID-19 Pandemic Era: A Survey of Kaleida Health Physicians

The full toll of the COVID-19 pandemic on frontline healthcare workers is still unfolding, but early data suggests it may be exacerbating physician burnout and accelerating physician retirement plans. According to Doximity's 2021 "Physician Compensation Report" nearly three-quarters of physicians reported being overworked and 22% were consequently considering early retirement. In a 2021 MGMA Stat poll 28% of healthcare administrators disclosed that a physician had unexpectedly retired from their organization in the last year. We undertook this study to assess how the COVID-19 pandemic had affected retirement planning amongst local Kaleida Health physicians with utilization of an additional 2019 3rd-party assessment from Ascendient to outline expected changes in our labor shortage by 2024.

We surveyed 280 Kaleida Health physicians asking in which year they perceived themselves retiring in 2019 followed by which year they perceived themselves retiring currently. Survey respondents were anonymous and blinded by age. Indication of the top 3 factors that contributed to their decision were queried as follows: government mandates, insurance regulations/documentation, regulations, clinical duties, change in income, health, weather, family, or other. Ascendient Healthcare Advisors, was recruited in 2019 to assess the net market deficit in Kaleida physician labor by 2024. Using descriptive statistics from our survey data and the preliminary 2019 Ascendient data, we ascertained any expected change to the Western New York physician labor shortage by 2024.

From 263 physicians that fully responded, 32% of overall respondents (n=85) changed their proposed retirement year. 70.6% of respondents who changed their retirement date (n=60) expected to retire at an earlier age than prior, while 29.4% (n=25) expected to retire at a later date. Family obligations (n=62), augmenting clinical duties (n=53), government mandates (n=47), and loss of reimbursement (n=45) were amongst the most popular citations for change-related reasoning. Of those expected to retire early, they advanced their retirement age by an average of 5.25 years. Ascendient data in 2019 predicted a 10.9% deficit in WNY physician work force by 2024. From our respondents, there was a net deficit of 5.3% of physicians who reported that they would retire on or before 2024 who had originally intended to remain employed past 2024. Our data predicts a novel total deficit of 16.2% in the local physician work force by 2024. Extrapolating by our total marked need, we surmise that WNY will need to enlist approximately 351 new physicians to meet community needs by this date.

Despite national data suggesting increasing COVID-19-related physician burnout, there is a paucity of current literature predicting retirement trends in specific healthcare networks. Our findings are consistent with pandemic-related factors exacerbating early retirement planning and inflating our region's expected future labor deficit. Measures to ameliorate the effects of burnout amongst physicians clearly must be sought.

Medical Student Research

Samuel Soff

Jason Yoo, Rohith Vaddavalli, Rachel Wong, Maggie Hall, Richard Moffitt

Stony Brook University

Paradoxical Trend of Post Acute Sequelae of SARS CoV-2 (PASC) in Type 2 Diabetics

Introduction: Up to 43% of patients with COVID-19 infection will develop Post Acute Sequelae of SARS CoV-2 (PASC), as defined by persistent long term symptoms for more than 4 weeks after infection. Diabetes has been associated with more severe acute COVID-19 outcomes, and data suggest that more severe outcomes are associated with worse glycemic control. It is unknown whether glycemic control affects the risk of developing PASC.

Objective: To determine if there is an association between the level of glycemic control (HbA1c) and the development of PASC in patients with Type 2 Diabetes.

Methods: A retrospective cohort study was done using electronic health record data from US health care systems contributing to the National COVID Cohort Collaborative (N3C) Enclave, a nationwide database containing over 5 million COVID patients. PASC rates were determined using two methods. In the 'ML' approach, PASC was defined by a previously developed machine learning algorithm trained on patients diagnosed with the ICD-10 code for PASC (N=151,646). In our 'ICD' approach, endpoints were defined by COVID-19 related diagnoses (cough, fatigue, etc.) in diabetic adult patients 30-365 days after COVID infection (N=163,186). Glycemic control was defined in 6 Hba1c groups: GP1 (Hba1c <6) , GP2 (6-7), GP3 (7-8), GP4 (8-9), GP5 (9-10), and GP6 (>10). Multivariable logistic regression models were constructed relating each PASC endpoint to Hba1c, demographics, comorbidities, and severity of acute infection.

Results: With the ML endpoint, higher HbA1c was associated with a decreased OR for PASC compared to GP1: GP2; 0.94, GP3; 0.86, GP4; 0.85, GP5; 0.78, GP6; 0.73. The symptoms reporting approach independently showed a similar trend: GP2; 0.82, GP3; 0.76, GP4; 0.75, GP5; 0.72, GP6; 0.65. $p < 0.001$ for all comparison groups. As a control cohort, we looked at the same symptoms diagnosed in diabetics between 1/1/2018 and 6/1/2019 (pre-COVID). The same trend was observed: as patients' HbA1c increased, they were less likely to be diagnosed with cough, fatigue, headache, etc. (GP2; 0.87, GP3; 0.82, GP4; 0.80, GP5; 0.78, GP6; 0.66).

Conclusion: With all approaches as well as for non-COVID controls, poor glycemic control in diabetics was associated with a lower OR of diagnosis of PASC and related symptoms. Given the mountain of evidence that poor glycemic control contributes to development of comorbidities, it is unlikely that hyperglycemia reduces the risk of developing PASC. Alternatively, coding bias for patients with more severe comorbidities could explain fewer diagnoses of PASC and 'minor' related symptoms appearing in these patients' records. Future work will leverage symptoms from clinical notes, rather than diagnosis; therefore reducing potential coding bias.

New York



New York Chapter
American College of Physicians

Annual Scientific Meeting

Resident/Fellow Clinical Vignette

Poster Presentations

Saturday, November 5, 2022

Westchester Marriott Hotel

670 White Plains Road

Tarrytown, NY 10591

Resident/Fellow Clinical Vignette

Zeinab Abdulrahman, MD

Hayder Azeez, MD (Internal Medicine resident at Zucker School of Medicine at Hofstra/Northwell Mather Hospital program)

Hindreen Abdulrahman (Pharmacy student at University of Texas at El Paso School of Pharmacy)

Kristopher M. Carbone, MSBS-MS, MD (Intensivist at Zucker School of Medicine at Hofstra/Northwell Mather Hospital program)

Zucker School of Medicine at Hofstra/ Northwell Mather Hospital program

A Case Report: I Can't Believe it's Not Asthma - Acute Hypercapnic Respiratory Failure in an Elderly Woman

Introduction

Acute hypercapnic respiratory failure (AHRF) can be encountered in the ER, inpatient units, and postoperatively or in the ICU. AHRF may develop acutely or exacerbated during times of acute stress in those with underlying chronic hypercapnia. Causes of AHRF include COPD, central & neuromuscular disorders, and thoracic cage disorders.

Patients with myasthenia gravis (MG) present with ocular symptoms such as ptosis and/or diplopia in about 50 % of the cases. Approximately 15% of patients present with bulbar symptoms such as fatigable chewing, dysphagia, and dysarthria. Less than 5% present with limb weakness alone. However, initial presentation of AHRF is exceedingly rare and is typically suspected in patients with known myasthenia who have undergone an acute insult resulting in a myasthenia crisis.

Case Presentation

A 75-year-old woman with a history of CAD with stent, asthma, diabetes, hypertension, hypothyroidism presented to the ER with worsening dyspnea on minimal exertion for two days. At triage in the ER, she became dizzy and cyanotic, and her oxygen saturation was noted to be 70% on room air. The patient was placed on NIPPV and improved to 90%. Other vital signs were significant for RR 25 breaths/min. Physical examination revealed clear breath sounds and no murmurs was appreciated. Laboratory workup was significant for WBC 11.16 K/uL and creatinine 1.43 mg/dL. Her initial blood gas showed an uncompensated respiratory acidosis (PH 7.19/PCO₂ 55 mmHg/O₂ 62 mmHg/ HCO₃ 21 mmol/L). Imaging revealed no pulmonary infiltrates and was negative for pulmonary embolism. The patient was admitted to the ICU. The patient was treated empirically for an asthma exacerbation with nebulizers and a course of steroids. The patient subsequently developed diplopia with ptosis and bilateral shoulder weakness. Neurology was consulted and after performing further work up, Myasthenia gravis was diagnosed. Intravenous immune globulin and Plasmapheresis were initiated. Her shoulder weakness, diplopia and ptosis were improved initially, but unfortunately the patient had such severe symptoms and diaphragmatic weakness that made her unable to wean off the NIPPV. Patient deferred intubation and tracheostomy and was made comfort measures only. The patient expired thereafter in the hospital.

Conclusion

Myasthenia gravis (MG) is a complex disorder which in rare circumstances can be complicated by respiratory failure after an initial insult, known as a myasthenic crisis. Usually, those patients develop respiratory symptoms during the later course of their disease and have other neurological signs and symptoms. Although an initial presentation of MG as an AHRF is rare, we must consider it within our differential in elderly patients who have an otherwise negative workup and who are not responding to therapy for our initial diagnosis.

Resident/Fellow Clinical Vignette

Hussein Abu-Hashish

Esraa Askar MD, Hrede Afsana MD, Geevarghese John MD

Long Island Jewish Forest Hills, Donald & Barbara Zucker School of Medicine at Hofstra/Northwell

A CASE OF ATYPICAL PRESENTATION OF MICROSCOPIC POLYANGIITIS

Introduction

Microscopic polyangiitis (MPA) is an autoimmune disease characterized by a systemic vasculitis that mainly affects the small-caliber blood vessels and includes the presence of antineutrophilic cytoplasmic autoantibodies (ANCA). MPA can cause damage to multiple organs including the kidneys, lungs, nerves, joints and skin. We report an atypical case of MPA in a 63-year-old male presenting with chest pain.

Case Presentation

We present a case of a 63-year-old male with a history of hypertension, a single kidney (status-post resection due to shotgun injury), who presented to the emergency department for right sided chest pain and cough for 2 weeks prior to presentation. Computed tomography (CT) of the chest revealed superimposed consolidations, right pleural effusion, pulmonary fibrosis, enlarged mediastinal and hilar lymph nodes. He was started on antibiotics for suspected community acquired pneumonia (CAP). The patient's hospital course was complicated by severe headaches, CT head with and without IV contrast was unremarkable. Initial laboratory results revealed worsening kidney function. His pulmonary symptoms did not improve on antibiotics. Moreover, his headache did not improve on acetaminophen, thus neurology team was consulted with suspicion of migraine. Patient was started on diphenhydramine, valproate sodium, metoclopramide, and nortriptyline, which were also unsuccessful. Given the multiorgan affection, rheumatic disease evaluation was performed with antinuclear antibody (ANA) at a titer of 1:320, perinuclear anti-neutrophil cytoplasmic antibody (P-ANCA) at a titer of 1:128, erythrocyte sedimentation rate (ESR) of 83 mm/hour, positive MPO (myeloperoxidase), and negative Cytoplasmic ANCA (c-ANCA). The patient was started on intravenous steroids with resolution of his symptoms. He was discharged on high dose oral steroids which was then tapered down.

Discussion

Here we have an atypical presentation of one of the vasculitides. This case was a particularly diagnostic challenge as the patient presented with poor renal function, which was initially dismissed as being due to him having a single kidney.

Although renal symptoms are common in MPA, other general symptoms like arthritis and rashes, that are frequently observed in other vasculitides were not seen in this patient. The persistence of pulmonary and migraine symptoms despite treatment raised the suspicion of a vasculitic condition.

Induction and maintenance of recovery are the major goals of treatment for MPA. This can be achieved by the use of corticosteroids and other immunosuppressive medications such as cyclophosphamide. Alternative treatment options include intravenous immunoglobulin and Rituximab.

Conclusion

When patients present with a diagnosis on admission, clinicians tend to fall into biases to solely treat that diagnosis. Physicians must always be amenable to change their diagnosis as new information presents itself, especially if they notice their treatment plan is not effective. Diagnosis of MPA is challenging because it involves multiple organs and can present differently among patients.

Resident/Fellow Clinical Vignette

Nada Akkari

Nazima Khatun, MD., Ammar Yasser Abdulfattah, MD., Suzette Graham-Hill, MD

Downstate University Hospital

NEW-ONSET ATRIAL FIBRILLATION IN THE SETTING OF COVID-19 INFECTION.

Introduction: There's an increased rate of reported new-onset atrial fibrillation (AF) in the setting of an acute COVID-19 infection or as sequelae of the infection. The underlying pathophysiology remains unclear and may be attributed to COVID-19 affecting myocardial microvascular pericytes expressing the angiotensin-converting enzyme 2 (ACE-2) receptors which may lead to tissue inflammation, edema, and fibrosis. Other contributors to myocardial inflammation and disruption in electrical circuits include pulmonary hypertension, regulatory T cells, and angiotensin.

Clinical presentation: A 76-year-old male with a significant past medical history of hypertension, and diabetes presented to the emergency department with fever, cough, and shortness of breath. Vitals were stable and unremarkable physical examination findings. He was found to be COVID-19 positive, and other laboratory tests were within the normal limit. Chest x-ray showed mild plate-like opacities in the left lower lobe. Electrocardiogram revealed new-onset AF with a ventricular rate of 76 bpm. Transthoracic echocardiogram showed moderate dilatation of the left atrium, mild dilatation of the right atrium, and trace tricuspid regurgitation. The patient was treated and discharged home on metoprolol succinate 25 mg daily and Apixaban 5 mg twice daily with cardiology follow-up.

Discussion: A study by Rosenblatt et al., showed that hospitalized patients with COVID-19 reported to have new-onset AF, at a rate of 5.4%, were reported to have a notable impact and poor clinical outcomes. Moreover, half of those patients died during their index hospitalization. However, new-onset AF was not statistically significantly associated with death after a multivariable adjustment for comorbidities and disease severity. This suggests that new-onset AF might not be a stand-alone factor of mortality, but a marker of other unfavorable clinical factors. In another study, COVID-19 patients with new-onset AF were related to worse cardiovascular outcomes; namely a higher incidence of embolic events. These effects were found to be worse than in patients with previous AF and those with normal sinus rhythm. Furthermore, a greater incidence of bleeding and longer hospital duration was found in patients with new-onset AF. The triggering mechanism for de novo AF in COVID-19 patients is still poorly understood, but several factors might play a role such as reduction in ACE-2 receptor availability, increased adrenergic and sympathetic stimulation, acid-base and electrolyte imbalances, endothelial damage, systemic inflammation, and cytokine storm, microthrombi formation, and myocardial injury. Further investigation into the relationship between COVID-19 infection and de novo AF to illicit the causal factors is necessary to identify high-risk patients and unravel feasible treatment modalities and long-term outcomes in those patients.

Rosenblatt, A.G., et al., New-Onset Atrial Fibrillation in Patients Hospitalized With COVID-19: Results From the American Heart Association COVID-19 Cardiovascular Registry. *Circ Arrhythm Electrophysiol*, 2022. 15(5): p. e010666.

Resident/Fellow Clinical Vignette

Ali Al Safi, MBChB

Ali Al Safi, MBChB

Sujan Niraula, MD

Valerie Cluzet, MD, MSCE

Nuvance Health - Vassar Brothers Medical Center

Acquired Hemophilia in the Time of COVID

Introduction:

Acquired Hemophilia A (AH) is a rare but potentially life-threatening condition caused by autoantibodies directed against factor VIII. It is associated with various autoimmune diseases, medications, or even pregnancy; however, it can be idiopathic in about 50% of cases. Vaccines have been implicated in the formation of autoantibodies and several cases have been reported regarding vaccine-induced AH. We describe here a rare case of AH in a patient with rheumatoid arthritis in the setting of recent COVID vaccination.

Case presentation:

A 54-year-old female with a history of uncontrolled type 2 diabetes mellitus and rheumatoid arthritis (RA) presented to the hospital with multiple ecchymoses over the body and swelling of the left forearm for 12 days. She had received a COVID vaccine booster 10 days prior. She denied active bleeding, intake of antiplatelets or anticoagulants, or any personal or family history of coagulopathy or bleeding disorders.

On examination, vital signs were within normal limits. She had multiple ecchymoses on the left upper extremity and bilateral lower extremities with associated tenderness. Otherwise, cardiovascular, respiratory, and neurological exams were unremarkable.

Initial blood work, including CBC, BMP, and LFTs, was unremarkable except for prolonged APTT (69.7 seconds). CT of the left upper extremity showed hematoma over the olecranon process. Further studies were ordered to evaluate for AH and the patient was discharged on the same day with a close outpatient follow-up with a hematologist. She was seen in the outpatient clinic the following day. Mixing studies revealed prolonged APTT. Further studies showed factor VIII deficiency with a positive VIII enzyme inhibitor assay. Nijmegen-Bethesda assay was elevated (48.3 seconds), which confirmed the presence of antibodies against factor VIII. The results were consistent with AH and treatment options were discussed with the patient. She was started on rituximab.

Discussion:

AH is extremely rare, with an overall incidence of 1.5 per million per year. Among patients with autoimmune diseases, AH has mainly been seen in patients with RA. There are multiple studies linking vaccinations and autoimmune diseases; however, no current evidence supports causation. With the expansion of the COVID-19 vaccination campaign, it is very important to be aware of this condition as a possible, albeit extremely rare, side effect. Even though our patient had a reasonable cause for AH, which is RA, that does not rule out COVID-19 vaccination as a potential trigger, in the presence of several studies describing the association of the vaccine with this condition. Prednisone is recommended as initial therapy for AH. Rituximab, although not FDA-approved for AH, has been recommended for patients with contraindication to steroids or as second-line therapy. Our patient could not receive steroids due to uncontrolled diabetes and was, therefore, started on rituximab.

Resident/Fellow Clinical Vignette

Lemchukwu Amaeshi, MBBS

Montefiore Medical Center, Wakefield Division

Eculizumab in refractory autoimmune hemolytic anemia

Autoimmune hemolytic anemia (AIHA) is an uncommon cause of hemolytic anemia with a prevalence of 17 cases per 100,000 cases. Here we present a case of refractory AIHA managed with eculizumab.

A 62-year-old woman presented with lightheadedness, headaches, and dizziness. Her laboratory results at presentation were consistent with pancytopenia with features of hemolysis. She has a medical history of significant recurrent, refractory autoimmune hemolytic anemia (mixed type). Although she had been on several therapeutic measures for her AIHA, including steroids, intravenous immunoglobulin (IVIG), and rituximab, she has had multiple AIHA flares requiring hospital admission.

Hematology service deemed her to be having another AIHA flare. She was started on IVIG, high-dose steroids, erythropoietin, rituximab and received blood transfusion as needed (transfusion threshold – 5g/dL). A bone marrow biopsy was performed, which revealed a hypercellular marrow with reduced trilineage hematopoiesis and significant involvement by CD5⁻/CD10⁻/CD20⁻ low-grade mature B cell lymphoma. CD55/CD59 testing was done, which showed no evidence of paroxysmal nocturnal hemoglobinuria. We treated her lymphoma with cyclophosphamide, vincristine, and prednisone (CVP), in addition to acalabrutinib, a Bruton Tyrosine Kinase (BTK) inhibitor, which is effective in AIHA associated with her type of lymphoma; however, this was stopped when she was found positive for PCGL2 mutation, which makes her resistant to acalabrutinib. Although her platelet and reticulocyte count improved, her anemia persisted. Splenectomy was considered the next step; however, the Hematology consultant recommended a trial of eculizumab before resorting to splenectomy. We started weekly eculizumab infusion, with subsequent decline in clinically significant hemolysis as demonstrated by a gradual but persistent increase in her hemoglobin and haptoglobin levels with a corresponding decrease in lactate dehydrogenase, indirect bilirubin, reticulocyte count, and importantly, a reduction in blood transfusion dependence.

Autoimmune hemolytic anemia occurs when autoantibodies bind to red blood cells leading to complement activation and ultimately destruction of these cells. The mainstay of treatment is the suppression of autoantibody production, which can be achieved using corticosteroids and other medications such as rituximab. Splenectomy is considered in refractory cases of AIHA, but this is fraught with complications. Eculizumab, a C5 inhibitor, traditionally used in treating paroxysmal nocturnal hemoglobinuria (PNH) and atypical hemolytic uremic syndrome, has demonstrated some benefits in treating AIHA. There are few cases reports of refractory AIHA treated with eculizumab reported in the literature. Physicians should be aware of C5 inhibitors, such as eculizumab, as a possible therapeutic option in treating refractory cases of autoimmune hemolytic anemia.

Resident/Fellow Clinical Vignette

Yosef Joseph Rene Amel Riazat-Kesh

Icahn School of Medicine at Mount Sinai Morningside/West Internal Medicine Residency

A rare presentation of underlying malignancy - painful splenic infarcts in vaginal squamous cell cancer

Background

Splenic infarcts are the end-product of either arterial or venous occlusion of the splenic vasculature, and are a rare complication of multiple common diseases, include blunt abdominal trauma; hematological malignancies; thromboembolic disorders; and generalized hypercoagulable states.

Typical age of presentation with splenic infarct is the early 50s, and common findings include left sided abdominal pain; splenomegaly; fevers; leukocytosis; nausea/vomiting; and raised LDH. Treatment involves analgesia, hydration, anti-emetics and investigation/treatment of underlying conditions. Treatment-dose anticoagulation has also been linked to improved survival in retrospective studies.

Case

A 70 year old female with no prior cancer history and recent right internal capsule infarction presented to the ED with new, atraumatic left upper quadrant and periumbilical pain radiating to her left shoulder.

She was afebrile, with moderate left upper quadrant tenderness, but no scleral icterus or jaundice. She also reported reduced appetite over several months. Initial lab tests (including CBC, CMP and troponin) were unremarkable.

CT abdomen pelvis showed multiple wedge shaped hypodensities concerning for splenic infarcts; as well as showing a distended uterine cavity with a large cystic mass; findings re-capitulated on MR abdomen-pelvis and trans-abdominal ultrasound.

Exploration under anesthetic with diagnostic laparoscopy confirmed pyometra in the setting of a large endometrial mass. Biopsy results were consistent with invasive squamous cell carcinoma, likely of vaginal origin. She was started on apixaban for treatment of her splenic infarct, and referred to radiation- and medical oncology to begin chemo-radiotherapy.

Discussion

Splenic infarcts are a rare cause of abdominal pain; and their presence should prompt consideration of potential serious underlying pathologies, including liquid and solid malignancies; hypercoagulable diatheses (e.g. JAK2 mutations, lupus anticoagulant); and acute pancreatitis. Our patient was found to have a new underlying gynecological cancer complicated by both splenic infarct and pyometrium. JAK2 and lupus anticoagulant screens were normal, with no other significant prothrombotic factors, and her case is a useful reminder of splenic infarct as a potential harbinger of underlying, otherwise silent, malignancies.

Resident/Fellow Clinical Vignette

Adina Amin

Laura Winner, MD, Amardeep Kalsi, MD, Amer Rafiaa, MD

NewYork-Presbyterian Brooklyn Methodist Hospital

INVASION OF THE BONE MARROW BY AL AMYLOID

Introduction: Primary amyloidosis, also known as immunoglobulin light chain (AL) amyloid, is the most common type of amyloid. It is characterized by deposits of light chains in the tissues, leading to organ dysfunction, and is categorized as localized or systemic forms of disease. The prognosis of amyloidosis is strongly dependent on the percentage of organ involvement and invasion. Unfortunately, by the time most cases of amyloidosis are diagnosed, the disease burden is already very severe.

Case Description: A 70 year old female with a past medical history of AL amyloidosis (biopsy proven Lambda-light chain deposition in kidney, on chemotherapy), hyperlipidemia, chronic kidney disease stage 3B, diabetes mellitus II, anemia of chronic disease, and peripheral vascular disease, presented to the emergency department for worsening pancytopenia found on outpatient labs. She had become increasingly lethargic over the last four months. Her last chemotherapy session was 3 months prior to presentation. Her course since then included a prolonged hospitalization due to weakness, repeated falls, diarrhea, dysuria, and memory loss with discharge about 1 month prior. On the current admission, she was found to be hemodynamically stable, however her labs were significant for critically severe pancytopenia with a white blood cell count of 0.48, anemia (hemoglobin 7), and thrombocytopenia (16k). A peripheral smear was reviewed and showed hypochromic RBCs, elliptocytes, burr cells, rare schistocytes, numerous bands with toxic granulations, and markedly decreased platelets. A bone marrow biopsy was obtained and showed significant effacement of normal marrow elements by amyloid. Unfortunately the patient became transfusion dependent and critically ill due to her severe marrow failure and ultimately passed away.

Discussion:

Patients with amyloid often have multi-organ invasion, however bone marrow infiltration is typically more characteristic of monoclonal gammopathies. More than 10% amyloid involvement of the bone marrow is associated with a higher mortality rate and overall worse prognosis. Therefore, lytic amyloid involvement leading to osteolysis of the bone is often missed until one is experiencing severe bone marrow suppression, becoming transfusion dependent, such as in this patient. Currently there are no treatment options for bone marrow invasion of amyloid. However, diagnostic studies with x-ray, MRI and bone marrow biopsy could be done preemptively at the time of initial diagnosis to evaluate for bone marrow invasion of the disease. Unfortunately this patient's rapid disease progression could not be halted, however hopefully in others prompt diagnosis and treatment could prevent such abrupt decline.

Resident/Fellow Clinical Vignette

Katherine Andrade

Kata Boros MD, Esraa Askar MD, Miriam Smith MD, Janette Hernandez-Torres MD

Long Island Jewish Forest Hills, Donald & Barbara Zucker School of Medicine at Hofstra/Northwell

STAPHYLOCOCCUS PETTENKOFERI: A STICKY EMERGING AND POTENTIALLY UNDERESTIMATED HUMAN PATHOGEN

Introduction

In 2002, *Staphylococcus pettenkoferi*, a coagulase-negative staphylococcus was first identified in Germany. Though cases of *Staphylococcus pettenkoferi* causing clinically significant infections are exceedingly rare, its detection is on the rise with advancements in Matrix-Assisted Laser Desorption/Ionization-Time of Flight detection software. We present two cases of *Staphylococcus pettenkoferi* bacteremia.

Case presentation

A 44-year-old bedbound male with a history of traumatic brain injury, tracheostomy, and percutaneous endoscopic gastrostomy tube presented to the hospital with 2 days of fever. Vital signs included a temperature of 104.1 Fahrenheit, a heart rate of 158 bpm, and a blood pressure of 117/64 mmHg. The remaining physical examination was unremarkable. Laboratory findings showed WBC 23 K/uL, urinalysis with positive nitrites, and leucocyte esterase, white blood cells 25/HPF, and blood cultures grew *S. pettenkoferi*. A transthoracic echocardiogram showed no valve abnormalities or vegetation. The patient was treated with Cefazolin intravenously to complete a 10-day course from the negative blood cultures.

A 73-year-old female with a history of hypothyroidism, and alcohol disorder presented to the hospital with 2 days of encephalopathy. Vital signs included a temperature of 98 Fahrenheit, a heart rate of 110 bpm, and a blood pressure of 106/55 mmHg. The remaining physical exam was notable for confusion. The laboratory showed WBC 17.6 K/uL, sodium 121 mmol/L, magnesium 1.1 mg/dL, phosphorus 1.5 mg/dL, and potassium 2.8 mmol/L. Blood cultures grew *S. pettenkoferi* and *S. epidermidis*. A transthoracic echocardiogram showed no valve abnormalities or vegetation. She was successfully treated with Vancomycin intravenously for a total of 10 days from the negative blood culture.

Discussion

Staphylococcus pettenkoferi is considered to be a low virulence organism part of normal human flora. Its pathogenicity includes slow growth with evasive persistence, proliferation in macrophages, biofilm formator, and capabilities for causing clinically significant diseases. Immunosuppressed, diabetic, elderly, and patients with implanted devices and catheters are at higher risk for bacteremia, endocarditis, osteomyelitis, and even death. The lack of evidence-based studies about epidemiology, clinical presentation, diagnosis, evaluation of endocardial involvement, and antibiotic protocols make management decisions challenging. In our cases, bacteremia with this organism raises concern for an infection with a possibility of endocardial involvement. The inconsistent antibiotic susceptibilities also raise concern for *Staphylococcus pettenkoferi* becoming a major factor in the spread of antibiotic resistance genes. Infection with this organism leads to uncertainty, underdiagnosis, and challenging antibiotic management.

Conclusions

Staphylococcus pettenkoferi, a normal part of human flora is becoming an important organism associated with deep infections. More studies are needed to establish guidelines for evaluation, diagnosis, and antimicrobial management.

Resident/Fellow Clinical Vignette

Iqra Arshad, MD

Lincoln Medical Center

THYROTOXICOSIS, AN UNDER ACKNOWLEDGED SEIZURE ETIOLOGY.

Iqra Arshad MD, Ricardo Machado Carvalhais MD, Riyad J. Basir MD

Department of Medicine, Lincoln Medical Center, NY.

Introduction. Seizures secondary to thyrotoxicosis are uncommon and often under acknowledged by clinicians during initial assessment. There is limited data to report status epilepticus as a complication of thyrotoxic crisis.

Case Presentation. 69-years old female with past medical history of hyperthyroidism, atrial fibrillation, ischemic stroke with left-sided residual weakness and coronary artery disease who presented to the emergency department (ED) as status epilepticus. Family reported a 1-day history of vomiting, diarrhea and diffuse abdominal pain prior to seizures episodes and no prior history of seizures. The patient was non-compliant with her home medications. At presentation,

she was unresponsive; intubated for airway protection and was given midazolam and levetiracetam. She had fever of 100.2F, tachycardia and a dysconjugate gaze on initial clinical exam. Non-contrast head computerized tomography (CT) scan showed old right cerebral infarcts and CT abdomen/pelvis showed right lower lobe pneumonia. Empiric antibiotics for possible meningoencephalitis and aspiration pneumonia were started. Given patient's history, medication non-adherence and a 60-points score on the Burch-Wartofsky Scale; thyrotoxicosis precipitating seizures was also suspected. Work up was sent and the patient was given steroids, lugol's iodine and methimazole. Later, workup showed TSH < 0.1mIU/L (0.27-4.20 mIU/L), free T4 of 3.0ng/dL (0.9-1.8ng/dL), elevated TSI and TSH receptor antibodies, a negative drug screen and mild AKI. EKG showed atrial fibrillation with heart rate in 100-110. Antibiotics were discontinued after lumbar puncture analysis came back negative. During MICU course, the patient had episodes of hypotension requiring minimal vasopressor support followed by hypertension, suggestive of autonomic dysfunction. Sepsis was ruled out. Standard EEG showed no clear seizures and focal cerebral dysfunction in the area of prior stroke. Impression was post-stroke epilepsy with low seizures threshold from hyperthyroidism. Patient was extubated on the 7th day post admission. She had continuous improvement in her mental status to baseline and was discharged home with endocrine clinic follow up.

Discussion. Hyperthyroidism in general, is not a common cause of seizures or metabolic encephalopathy, however, it can lower the seizures threshold and can be the primary cause of seizures in rare cases (0.2%). Our patient presented as status epilepticus related to uncontrolled hyperthyroidism that lowered the threshold of seizures in her case. Gradual improvement in her mental status after initiating thyrotoxicosis treatment and absence of other etiologies of seizures support the diagnosis of thyrotoxicosis related seizures. Hyperthyroidism should be considered in assessment of seizures as it carries high mortality (10 to 30%). Physicians should be aware of this possibility and have a high index of suspicion in patients with hyperthyroidism who present with first time seizures and thyrotoxic crisis.

Resident/Fellow Clinical Vignette

Aqsa Ashraf

Aqsa Ashraf; Juby Roy; Zachary Kushner

Northwell Health, Mather Hospital

A Rare but Possible Occurrence of Proton Pump Inhibitor's Effect on HK α 1 Pumps in Kidney Resulting in Acid Base Disturbances

Introduction:

Distal renal tubular acidosis (dRTA) results from defective urinary acidification process secondary to impaired protons excretion. While it is well established that proton pump inhibitors (PPIs) irreversibly inhibit HK α 1-mediated acid secretion in the stomach, their effect on HK α 1 in kidneys is rarely reported. We report a rare occurrence of rhabdomyolysis associated with marked hypokalemia secondary to PPI and non-steroidal anti-inflammatory drugs (NSAID)-induced dRTA.

Case:

A 69-year-old female with medical history of chronic back pain, osteoarthritis, and hypertension presented with decreased urine output and dark colored urine for one day. Outpatient medications included ibuprofen 600 mg TID for the past 10 years and pantoprazole 40 mg QD for the past one month. She appeared lethargic; the rest of the physical exam was unremarkable. Laboratory investigation revealed creatine phosphokinase (CPK) 34,000 units/L, myoglobin 8,899 ng/mL, sodium 138 mmol/L, potassium (K) less than 1.8 mmol/L, chloride 111 mmol/L, bicarbonate 17 mmol/L, blood urea nitrogen 16 mg/dL, creatinine 1.04 mg/dL, and corrected anion gap (AG) 12.5. Liver chemistry showed aspartate aminotransferase 774 u/L, alanine aminotransferase 170 u/L, albumin 3 g/dL, and bilirubin 0.2mg/dL. Arterial blood gas suggested mixed metabolic acidosis and respiratory alkalosis with pH 7.41, PaCO₂ 29 mmHg, and PaO₂ 82 mmHg. Urine analysis was positive for hematuria, <5 RBCs, myoglobinuria, mild proteinuria, pH 7.5 and AG of 11. Electrocardiogram showed a normal sinus rhythm and U waves in V4. Baseline blood workup 3 months ago was within normal limits except for K 3.2 mmol/L. She was diagnosed to have PPI and NSAID-induced dRTA and subsequent rhabdomyolysis. She received aggressive fluid hydration and potassium supplementation. A repeat EKG demonstrated resolution of the U waves. She was subsequently discharged to home with potassium supplements and a recommendation to follow up with her primary care physician.

Discussion:

The etiology of dRTA is heterogenous and can be attributed to genetic or acquired causes. According to our search involving 3 databases (PubMed, Google Scholar, and Cochrane), 4 cases had been reported where PPIs were directly or indirectly associated with dRTA. NSAID-induced RTA and subsequent hypokalemia is poorly understood and is thought to be secondary to carbonic anhydrase inhibition in proximal and distal renal tubules. Our case underscores the importance of withholding the PPIs and NSAIDs while evaluating dRTA; an intervention providing the maximum benefit with least associated side effects.

Conclusion:

This case suggests the importance of further studies to assess the incidence of PPI and NSAID-induced dRTA in patients with chronic PPI and NSAIDs use, mild cases of which can be clinically silent. We further suggest holding PPIs and NSAIDs in patients with dRTA which can initiate or exacerbate metabolic acidosis resulting in its inherent complications.

Resident/Fellow Clinical Vignette

Esraa Askar

Katherine Andrade MD, Sunil Partap MD, Sangam Jhaveri MD, Teekaram Persaud, MD, Regine Cherazard MD

Department of Medicine, Long Island Jewish Forest Hills, Donald & Barbara Zucker School of Medicine at Hofstra/Northwell, Forest Hills, NY, USA

A FATAL CASE OF EDWARDSIELLA TARDA BACTEREMIA ASSOCIATED WITH ADVANCED LIVER DISEASE

Introduction

Edwardsiella tarda (*E. tarda*) is a Gram-negative facultative anaerobe and member of the Enterobacteriaceae family that was first identified in 1965. It has been linked to fresh and brackish water marine environments and is primarily a pathogen in fish, reptiles, and amphibians; however, it can infect mammals. Human infections are rare but often fatal, most commonly affecting immunocompromised hosts. We present a fatal *E. tarda* bacteremia case in a 60-year-old man with alcoholic liver cirrhosis.

Case presentation

A 60-year-old Asian man with a medical history of alcoholic cirrhosis and esophageal varices presented to the emergency department unresponsive. He was intubated for airway protection and transferred to the intensive care unit. His serum lactate was 5.3 mmol/L (0.7–2 mmol/L), direct bilirubin was 26.4 mg/dl (0.0–0.3 mg/dl), indirect bilirubin was 7.1 mg/dl (0.2–1.0mg/dl), creatinine was 1.56 mg/dl (0.5–1.30mg/dl), and his arterial blood gas was consistent with mixed metabolic and respiratory acidosis. We managed his sepsis with piperacillin/tazobactam, intravenous fluid resuscitation, and vasopressors. Admission blood cultures grew pan-sensitive *E. tarda* in 4 bottles. The antibiotic regimen was de-escalated to ceftriaxone with negative repeat blood cultures 4 days later. Despite appropriate antimicrobial and medical management, he progressed to multiorgan failure. Given the poor prognosis, his family elected for palliative extubation.

Discussion

In the United States, *E. tarda* is primarily found in the waters of Mississippi, Arkansas, Louisiana, and Texas, with seasonal distribution between July and November. *E. tarda* infections are water- and foodborne, affecting immunocompromised hosts with severe underlying illnesses such as malignancy, diabetes, and hemoglobinopathies. This is a unique case of an immunocompromised resident of New York City without recent travel, sick contacts, marine environment exposure, or ingestion of contaminated water/food. Unfortunately, surviving the bacteremia did not change his poor prognosis.

Clinical manifestations include typical gastrointestinal illness but also peritonitis, meningitis, hepatobiliary disease, osteomyelitis, cellulitis, and bacteremia. Liver cirrhosis is an independent risk factor of mortality, reaching 50% with sepsis. The mechanism of pathogenesis is unknown. A primary form of virulence might occur by inhibition of the apoptotic process in the host cells, allowing for intracellular growth, replication, and survival. Isolates are susceptible to antimicrobial agents with a spectrum of activity against Gram-negative bacteria, but mortality remains high once sepsis has occurred despite appropriate treatment.

Conclusion

Clinician awareness of illness severity due to *E. tarda* infection and its associated elevated mortality risk in septic immunosuppressed patients despite sensitivity to antibiotics is paramount. Further studies are needed to fully understand host response, virulence mechanisms, and preventive strategies. A multifaceted management approach is required to improve survival rates effectively.

Resident/Fellow Clinical Vignette

Esraa Askar

Katherine Andrade MD , Tanesh Ayyalu MD , Barbara J. Berger MD

Department of Medicine, Long Island Jewish Forest Hills, Donald & Barbara Zucker School of Medicine at Hofstra/Northwell, Forest Hills, NY, USA

IDENTIFICATION AND RISK STRATIFICATION OF UNDER-RECOGNIZED SEPSIS - A RETROSPECTIVE REVIEW OF RAPID RESPONSE CALLS

Purpose

Gold standard sepsis management requires protocols targeting early detection and implementation of goal-directed therapy. Systematic use of protocols for sepsis has been demonstrated to improve outcomes, however activation of Code Sepsis (CS) is infrequent in our inpatient service. The Rapid Response Code (RRT) is more regularly practiced in our hospital to manage sudden clinical changes. Identification of sepsis and conversion of the RRT to CS might optimize diagnosis and management of sepsis. Our objective is to identify RRTs that could be reclassified as CS by SIRS (Systemic Inflammatory Response Syndrome) criteria or MEWS (Modified Early Warning Score) to quantify the burden of under-recognized sepsis.

Methods

Our Northwell Quality Improvement Department provided a list of RRTs at our hospital from May to June 2022. We reviewed their records to determine the number of patients who met SIRS criteria (temperature $>38.0^{\circ}\text{C}$ or $<36.0^{\circ}\text{C}$, heart rate >90 /minute, respiratory rate >20 /minute, white blood cell count $>12 \times 10^9/\text{l}$ or $<4 \times 10^9/\text{l}$) or MEWS (a point system that includes heart rate, systolic blood pressure, respiratory rate, hourly urine output, temperature, and mental status). Pre-validated cutoffs were used to determine patients who qualified for CS including two out of four SIRS criteria or a MEWS of five or more. Patients in this positive subset were reviewed to determine whether sepsis protocol was followed. Additionally, positive radiological and laboratory findings were matched to scores as confirmation of clinical sepsis.

Results

87 RRTs were called on 85 patients, none of whom were pregnant or below 18 years old. Of this cohort, 37 (42.5%) were positive by SIRS and 27 (31%) were positive by MEWS. After removing duplicates, 38 (45.8%) met CS criteria. SIRS criteria identified all patients who had positive physical findings, urine cultures, blood cultures or new infiltrates on chest X-ray. 32 of 37 (87%) patients who met SIRS criteria had blood cultures taken. 8 of those 32 (25%) had diagnostically positive tests. Investigations were diagnostically useful for all patients that met SIRS criteria. However, 5/37 (14%) patients positive by SIRS criteria did not have diagnostic cultures collected.

Conclusion

Our pilot study has identified a significant number of inpatients who met sepsis criteria, but did not activate the standardized sepsis protocol. The rate of non-collection of culture data demonstrates missed opportunities for diagnosis and management of sepsis. Implementation of CS protocols has previously been shown to correlate with better outcomes. Provider education to apply SIRS criteria to all RRTs and to convert RRT to CS is likely to enhance identification of sepsis and optimize outcomes. We will use these data as an opportunity to educate our clinical staff of the importance of recognizing sepsis and acting via CS protocols.

Resident/Fellow Clinical Vignette

Murilo Bastos

Kristine Lou Gargaritano M.D, Michael Kaplan, M.D.

Icahn School of Medicine at Mount Sinai Morningside/West

EARLY RECOGNITION OF MDA5 DERMATOMYOSITIS, A RARE AUTOIMMUNE DISEASE WITH RAPIDLY PROGRESSIVE LUNG DISEASE, BASED ON CLOSE OBSERVATION OF CLINICAL FINDINGS

Introduction: The natural progression of Interstitial Lung Disease in patients with Dermatomyositis varies significantly. Some patients are asymptomatic or present with slowly progressive symptoms. A small minority of patients, however, present with an amyopathic (muscle-sparing) variant associated with rapidly progressive lung disease. This type of dermatomyositis is associated with the anti-melanoma differentiation-associated gene 5 (MDA-5) autoantibody, and is nearly uniformly fatal unless acted upon early and aggressively.

Case Presentation: We describe a case report of a 32-year-old male with no past medical history who presented to the hospital with a 2-month history of worsening dyspnea, cough, fatigue, involuntary weight loss, and myalgia. Prior to this presentation, he attended multiple ED, urgent care, and outpatient visits for these symptoms. He tested negative for COVID multiple times and was initially treated for acute bronchitis and later for multifocal pneumonia during those encounters. His workup for pulmonary embolism was negative and CT chest showed diffuse patchy consolidations with lower lobe predominance. PFTs demonstrated a restrictive pattern. The patient underwent extensive infectious and oncologic workup, all unrevealing. An initial myositis panel was negative. At the time of his exam with rheumatology, a repeat myositis panel and skin biopsy were pending. On physical examination, the patient demonstrated diffuse inspiratory crackles bilaterally on auscultation, subtle violaceous plaques on his knees, and elbows, as well as nose, cheeks, and forehead. He had palmar erythema associated with fissuring and cracking of the skin of the palms, Gottron's papules on his fingers, and pronounced proximal muscular weakness characterized by limited neck flexion. Given the constellation of skin findings, myalgia, lung imaging, and rapidly progressive respiratory failure, a clinical diagnosis of MDA5 Dermatomyositis was made and later confirmed with a positive MDA5 test on the repeat myositis panel. He was subsequently treated aggressively with IV methylprednisolone, IVIG, and combination cyclophosphamide/tacrolimus therapy.

Discussion: Interstitial lung disease occurs in at least 30 percent of patients diagnosed with Dermatomyositis. The presence of MDA5 antibodies is linked to the elevated risk for ILD progression, and for this reason, early recognition of cutaneous findings in the setting of myalgia and respiratory failure is crucial for early intervention and aggressive systemic treatment. This case report represents the importance of the physical examination for early diagnosis and management particularly relevant in the absence of available specific autoantibody tests.

Resident/Fellow Clinical Vignette

Marco Bermudez, MD

Nehemias Guevara, MD; Laura Pedraza, MD; Akande Abdulrasheed, MD; Steven Epstein, MD.

SBH Health System

Prostate abscess in an insidious treatment resistant complicated urinary tract infection

Marco Bermudez, Resident, Department of Internal Medicine, SBH Health System, Bronx, NY.

A prostate abscess (PA) is a rare clinical entity with a disease incidence of 0.5%. Consequently, the diagnosis requires high clinical suspicion for prompt, minimally invasive surgical treatment.

A 59-year-old man with hypertension, uncontrolled T2DM, and benign prostatic hyperplasia (BPH), with a recent admission of acute urinary retention (AUR) with intermittent catheterization two weeks before presentation, presented to the ED with a two-day history of inability to void. The patient was afebrile and tachycardic. The physical exam was pertinent for suprapubic tenderness. Laboratories showed an HB1AC of 14%, a leukocytosis of 22,700/ul with neutrophilia, a urine analysis consistent with urinary tract infection (UTI), and a preliminary urine culture showing gram-negative bacilli. A diagnosis of complicated UTI was made. Ceftriaxone was started, and a Foley catheter (FC) was placed for AUR management.

During hospital course day two, a urine culture grew ESBL-positive *Klebsiella pneumoniae*. Ceftriaxone was changed to ertapenem. The patient developed worsening sepsis, with the emergence of fever and worsening neutrophilic leukocytosis despite four days of targeted antibiotics. An intravenous contrast-enhanced computed tomography (CECT) of the abdomen and pelvis reported findings consistent with a multiloculated PA measuring 6.2x6.8 cm.

Interventional radiology performed a bedside transrectal ultrasound (TRUS)-guided needle aspiration of the PA with no coadjuvant fluoroscopy guidance (CFG). The abscess drained 80 ml of pus. A transrectal tube was left in place for residual drainage of the PA. The patient clinically improved after the procedure.

PA cultures grew *E Coli* non-ESBL, *Staphylococcus haemolyticus*, and *Enterococcus faecalis*. Intravenous vancomycin was added. Seven days later, a follow-up intravenous CECT demonstrated complete resolution of the PA, and the transrectal tube was removed.

The FC was removed, and a suprapubic catheter was placed to divert urine from the prostate, ensuring better healing. The patient was discharged seven days after the surgical drainage to complete four weeks of intravenous antibiotics.

This case illustrates a rare complication of a complicated UTI, with the formation of a PA. Its high mortality rate (16%) requires urgent treatment and prompt detection of associated risk factors for its development. This case portrays the need for advanced imaging studies in the setting of a complicated UTI with worsening sepsis despite tailored antibiotics. Even though most prostatic abscesses need surgical drainage (up to 80%), there is no defined best surgical technique in the medical literature. This case favors TRUS-guided needle aspiration as the preferred minimally invasive surgical modality. It can be performed promptly at the bedside, under local anesthesia, and without the usage of CFG, a surgical technique variation rarely reported in the literature. This surgical technique successfully treats PA and prevents life-threatening complications.

Resident/Fellow Clinical Vignette

Gayatri Bondi, MD

Richard Loftus, MD

Bassett Medical Center

Twice is not-so-nice: Two presentations of “the widow-maker” sign in the same patient

Introduction

Diagnosing Wellens pattern, an easily-missed sign of impending myocardial infarction (MI), requires a high index of suspicion. If not recognized early, it can lead to massive and fatal acute anterior wall MI.

Case description

A 78-year-old man with atrial flutter, JAK2V617F mutation, and hypertension presented for routine cardiology visit. He was asymptomatic; blood pressure (BP) was 160/90 mmHg but other vital signs and physical examination normal. Routine electrocardiogram (ECG) showed T-wave inversion (TWI) in leads V3-V5, with 0.5 to 1 mm ST-segment elevations in leads V2-V6 [Fig 1], attributed to nonspecific repolarization changes. The next day the patient called his cardiologist about left-sided chest discomfort that resolved completely. His cardiologist sent him to the ER, where he had no symptoms and examination only notable for BP of 193/100. HS-troponin was elevated to 621.7 pg/ml. Serial ECGs showed worsening TWI in the precordium [Figs 2-4]. Echocardiogram showed apical akinesis. Emergent left heart catheterization (LHC) showed 99 % thrombus in mid-left anterior descending artery (LAD) [Fig 6]. After thrombectomy a drug-eluting stent (DES) was placed mid-LAD.

Seven months later, the patient presented similarly after 2 brief episodes of chest pain [table 1]. Due to concerns of stent thrombosis, angiography was performed on day 3, showing 95% proximal LAD blockage [Fig 7] that was stented, and patent mid-LAD stent. ECG changes resolved.

Discussion

T-wave inversions are seen in many pathologies [Table 2]. Wellens syndrome, also known as “LAD coronary T-wave inversion pattern,” or, the “widow-maker,” is an ECG pattern of T-wave changes in leads V2 and V3 seen with critical proximal LAD lesions. Uncommonly, T-wave changes can affect the entire precordium. Wellens syndrome is divided into Type A (deeply inverted T-waves in leads V2-V5; 75% of cases) and Type B (biphasic T-waves; 25%). The changes are 69% sensitive, 89% specific for MI, with a positive predictive value of 86% for critical LAD lesion.

Wellens syndrome diagnostic criteria include that patient is asymptomatic; an isoelectric or slightly-elevated ST segment (< 1 mm); normal R-wave progression in precordium without Q-waves; history of angina; and normal/minimally-elevated cardiac biomarkers. The subtlety of these traits can make Wellens syndrome hard to recognize. ECG changes often are deemed nonspecific or secondary to hypertensive urgency.

Wellens syndrome represents a pre-infarction state, so stress testing should be avoided as it can lead to acute MI. Management is as with acute MI: antiplatelet agents, anticoagulation, beta-blockers, nitrates. Definitive management is cardiac catheterization and PCI. Timely recognition with earlier intervention is essential for better patient outcomes.

Resident/Fellow Clinical Vignette

Nobel Chowdhury, MD

1. Nobel Chowdhury, Internal Medicine Resident Physician, Mount Sinai West-Morningside
2. Angela Liu, Hematology Oncology fellow, Mount Sinai Hospital
3. Attending physician, Hematology-Oncology, Mount Sinai West

Mount Sinai West-Morningside

A Rare Case of Extensive Cardiac Sarcoma

Introduction

Cardiac synovial sarcoma is an exceedingly rare cardiac tumor which occurs in young adult males. Due to the limited number of cases published and infiltrative nature of the disease, there is no clear guideline to treat this cancer.

Case Description

A 27-year-old African-American male was diagnosed with paraglottic high-grade synovial sarcoma in 2013. He underwent induction chemotherapy with doxorubicin and ifosfamide followed by adjuvant radiation but declined surgery. His disease was in remission for eight years, but relapsed in 2021 with a 6.7x3.5x4.2 cm laryngeal mass extending to the thyroid gland. He underwent surgical resection (tracheostomy, laryngectomy, pharyngectomy, total thyroidectomy) followed by chemoradiation, but was subsequently lost to follow-up. One year later (2022), he presented to the hospital for light-headedness. CTA chest showed a large mass (4.8x4.4x6.7cm) in his right ventricle (RV) extending into the right atrium and right ventricular outflow tract. He underwent debulking of the tumor. One month later, he returned to the ED for light-headedness and chest pain. CTA chest showed that the RV mass had returned and was now larger (7.2x5.5cm), with invasion into the left ventricle, mediastinum, azygos vein, and paratracheal region. He was admitted to the ICU for low cardiac output state. Pt was non-verbal due to his tracheostomy, but communicated through typing on his phone. Despite remarkable tumor burden, clinically he appeared relatively well with borderline blood pressure (100s/70s). Per cardiothoracic surgery, he was a poor surgical candidate. The Medical Oncology team thus recommended chemotherapy with ifosfamide, given his tumor had responded well to this regimen previously. Patient completed his ifosfamide infusion, however, developed increased work of breathing and hypoxemia on day 5 of chemotherapy. He was placed on the ventilator due to persistent hypoxemia. TTE showed EF 25-30% and a severely hypokinetic RV. Bronchoscopy done at bedside showed external compression of the left main bronchus by the tumor. Patient became increasingly hypotensive, and was placed on vasopressors for cardiogenic shock. Patient continued to deteriorate despite maximum ventilator and vasopressor support and was eventually transitioned to comfort-based care.

Discussion

This is a rare case of extensive recurrent cardiac sarcoma. Overall outcomes of synovial sarcomas are poor due to frequent relapses and metastases. This patient's course was complicated by increasingly shorter time intervals between remissions and higher stages at relapse. Close follow-up is essential to monitor disease status and metastasis. Complete resection at diagnosis is recommended if possible. A number of cases needs to be analyzed to establish treatment guidelines for this malignancy.

Resident/Fellow Clinical Vignette

Vincenzo Cimino

Nicholas Condiles MD

Lenox Hill Hospital, Northwell Health

An Umbilicated Lesion of the Conjunctiva: A Novel Presentation of Ocular Monkeypox Virus

Introduction: The recent outbreak of Monkeypox Virus (MPV) in 2022 has raised considerable concern in the public health sector due to the relatively rapid and geographically widespread nature of the current crisis. Tecovirimat (TPOXX) is an antiviral medication with activity against orthopoxviruses, most notably smallpox, which is now being used in patients with MPV, another orthopoxvirus. The medication is rather well studied, however its effectiveness against Monkeypox Virus continues to be monitored. We present a case of MPV with ocular involvement, and use of topical erythromycin to good effect.

Case presentation: 30-year-old male MSM with no past medical history, on preexposure HIV prophylaxis (PrEP) presented to the hospital over concern for MPV. The patient was in his normal state of health until 1 week prior to presentation when he developed nasal congestion and cough. He was tested for COVID and was found to be positive on PCR. 5 days prior to admission, he began to develop numerous pustular lesions on his penis, hands shoulder and back, which prompted him to see his infectious disease doctor. Outpatient testing for herpes simplex virus 1 and 2 was negative prior to admission. The lesions became increasingly painful, and the patient developed a lesion on the lateral palpebral conjunctiva of the right eye for which he was sent to the emergency room. Following admission, MPV DNA was detected by PCR testing of lesions on the penis, and the patient was enrolled in the TPOXX trial¹. For his conjunctival lesion, ophthalmology was consulted. Patient was examined and found to have one raised umbilicated lesion of the palpebral conjunctiva on the upper and one lower lid. Corneas were assessed and found to be clear. Per ophthalmology recommendations, the patient was started on topical erythromycin and artificial tears. Post intervention, the ocular lesions improved, and vision was unaffected. The patient was discharged home to complete course of TPOXX as an outpatient.

Discussion: MPV represents a rapidly expanding public health threat. While TPOXX has been shown to be effective against orthopoxviruses, guidelines do not yet exist for the treatment of disseminated lesions. Erythromycin is often used for its anti-inflammatory properties, as in this scenario, to good effect against a conjunctival monkeypox lesion without loss of vision². While no specific guidelines exist, this case describes successful use of a well-known medication in a fairly novel disease.

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Resident/Fellow Clinical Vignette

Vincenzo Cimino

Nicholas Condiles MD

Lenox Hill Hospital, Northwell Health

Mycobacterium Xenopi Thoracic Epidural Abscess: An Atypical Microorganism At An Atypical Site

Introduction: *Mycobacterium Xenopi* is an uncommonly seen pathogen, typically found in the lungs of patients with underlying lung disease and in immunosuppressed patients. Infections of the spine are exceedingly rare, with a comprehensive literature review revealing very few previously reported cases². In our case, we discuss a patient who presented with a *Mycobacterium xenopi* infection and her subsequent hospital course.

Case report: 45-year-old female with a past medical history of systemic lupus erythematosus (SLE) on hydroxychloroquine and 10 milligrams of prednisone per day presented to the hospital with 2 years of back pain and kyphosis and was found to have a T10-L2 compression fracture and epidural fluid collection. Patient was taken for successful surgical drainage, however postoperative course was complicated by intraoperative stroke of the pons and development of pneumothorax requiring chest tube placement, necessitating 3 days of intubation and pressors. Patient was subsequently extubated on postoperative day 4 and was noted to have new neurologic deficits, with repeat CT head revealing new pons infarct and new right occipital hemorrhage. Cultures obtained from neurosurgical drainage initially were positive for moderate Acid-fast bacillus on fluorochrome stain, and subsequently went on to be identified as *Mycobacterium xenopi* by DNA sequence analysis. Infectious disease was consulted, and the patient was started on rifampin, isoniazid, pyridoxine, ethambutol, and vitamin B6 supplementation with plan to continue for 18-month course. Of note, macrolide antibiotics are typically given for pulmonary *M. xenophi* infections, however this has only been studied in cavitary pulmonary disease and was held in this case. The patient gradually improved and was subsequently discharged to subacute rehabilitation.

Discussion: In this case, we describe an exceedingly rare extrapulmonary infection with *Mycobacterium xenopi*. The patient's history of SLE with chronic steroid use may have contributed to immunosuppression subsequently increasing predisposition to this infection. Unfortunately, the patient had multiple complications from her surgical intervention, however the underlying infection is rare, and was successfully treated using traditional therapy.

Sources

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Resident/Fellow Clinical Vignette

Cyrus De Souza, MD

Jimmy Wang, MD

Gokul Samudrala, MBBS

Bassett Medical Center

Do No Harm: An Unexpected Consequence of Rapid Glycemic Control

Introduction:

Treatment induced neuropathy in diabetes (TIND) was described by Gibbons and Freeman in 2010 as an acute onset of neuropathic pain and/or autonomic dysfunction within 8 weeks after abrupt HbA1c decrease of at least 2% points. The prevalence is unknown, possibly because it has been under-reported. There has been an increasing number of cases reported over the last 10 years. We present a case of TIND with severe orthostatic hypotension when HbA1c decreased 4.3% within one month.

Case presentation:

A 42-year-old male with a past medical history of type 2 diabetes (as reported by patient) complicated by peripheral neuropathy, and erectile dysfunction, presents to the hospital after a syncopal episode. He had been experiencing intermittent light-headedness over the last several months attributed to hypovolemia secondary to glucosuria. He denies any previous episodes of syncope, CP, SOB, palpitations, or hypoglycemic episodes. On physical examination, the patient was noted to be tachycardic with dry skin, dry oral mucosa and positive orthostatic vitals. Over the course of his hospitalization, despite fluid resuscitation, compression stockings, abdominal binder, addition of fludrocortisone, midodrine and salt tablets, the patient had persistent symptomatic severe orthostasis. B12, HIV, syphilis, TSH, urine catecholamines, testing for cortisol deficiency, testing for diabetes insipidus, cardiac work up with EKG and TTE and autoimmune testing were unremarkable. Notably, the patient has been using insulin obtained from abroad until his HbA1c was found to be 16.1 about one month prior to current admission. The patient was started on insulin sourced locally, and the repeat HbA1c within one month was 11.8. Eventually the patient was started on droxidopa (as an off label use), which began to improve his symptoms and he was able to regain his ability to walk without episodes of syncope. Though he remains mildly symptomatic, the patient has been able to return to work.

Discussion:

Treatment induced neuropathy in diabetes (TIND) was described by Gibbons and Freeman in 2010 as an acute onset of neuropathic pain and/or autonomic dysfunction within 8 weeks after abrupt HbA1c decrease of at least 2%. The mechanism of TIND is still unclear although there appears to be a dose-effect relationship between the likelihood of developing TIND and the amount of HbA1c change. The absolute risk of developing TIND is over 80% if HbA1c decreases more than 4% over 3 months.

Conclusion:

TIND could be highly debilitating and must be considered when new glycemic treatment is added to a patient with poorly controlled diabetes. Further studies are needed to study pathophysiology, prognosis and management options for this condition.

Resident/Fellow Clinical Vignette

Sunaina Dias, DO

Kenneth Lumbrazo DO

Sergio Obligado MD (Attending Physician)

Garnet Health Medical Center

Minimal Change Disease Associated With COVID-19 And APOL1 Genotype

Introduction: Coronavirus disease 2019 (COVID-19) has been shown to be associated with acute kidney injury in the form of nephropathy, most commonly in the form of focal segmental glomerulosclerosis (FSGS). Minimal change disease is a common kidney nephropathy in children that occurs less frequently in adults. The apolipoprotein L1 (APOL1) gene often predisposes people, specifically African Americans, to kidney disease, typically expressing as FSGS. However, the APOL1 gene expressing as minimal change disease is an uncommon presentation, particularly in adult patients with COVID-19.

Case presentation: A 49 year-old African American female, with a past medical history of iron deficiency anemia secondary to uterine fibroids presented with bilateral lower extremity swelling and increased urinary frequency and was found to have acute kidney injury with metabolic acidosis and severe proteinuria, anemia and asymptomatic COVID-19 infection. Labs were significant for sodium 125, creatinine 1.23, bicarbonate 21, urine protein >500, spot urine protein:creatinine 18.88g/g Cr, microalbumin 667 mcg/mg Cr and hemoglobin 6.2. Kidney biopsy was performed which showed 11 glomeruli, two glomeruli with global sclerosis and the remaining glomeruli were normal in size and otherwise unremarkable, consistent with minimal change disease. Patient was treated with prednisone, sodium bicarbonate tablets and upon follow-up her symptoms had resolved and labs had normalized. Also on follow up, she underwent reasight genetic testing and was found to be homozygous for APOL1 gene indicating she was at higher risk to develop chronic renal diseases including FSGS and end stage disease

Discussion: This case highlights a case of minimal change disease in an African American adult with COVID-19 and APOL1 genotype. While COVID-19 is associated with acute kidney injury, it is important to be able to recognize different types of presentations. APOL1 predisposes African Americans to kidney disease, often FSGS, however the association with minimal change disease is less well defined and continues to be a rare presentation. Our case allows to broaden the range of possibilities of COVID-19 associated nephropathies allowing for earlier treatment and better prognosis.

Resident/Fellow Clinical Vignette

Sudarshan Gautam

Norbert Moskovits; Suvash Shrestha; Arjun Basnet; Armando Seitllari

Maimonides Medical Center

Shunting across a latent Patent Foramen Ovale in a Patient with Right Ventricular Infarction improved with Impella RP.

Introduction:

Right ventricular infarction can lead to right ventricular failure with a rise in right ventricular and right atrial pressure. The elevated right atrial pressure can cause right to left shunting across a latent foramen ovale, bypassing the pulmonary circulation with eventual refractory hypoxemia. Impella RP is used for circulatory support in right ventricular failure, which pumps blood from the inferior vena cava to the pulmonary artery. We present a case of a 63-year-old female admitted for right ventricular infarct who developed refractory hypoxemia after the opening of latent patent foramen ovale and improved with an Impella RP.

Case presentation:

A 63-year-old female presented to the hospital with chest pain and was admitted for NSTEMI. Left heart catheterization showed 80 percent stenosis in the RCA with diffuse disease. Balloon angioplasty followed by two stent placements failed to improve the coronary blood flow. She subsequently developed right ventricular failure with hemodynamic instability with episodes of hypotension, bradycardia, and hypoxia. She was intubated, and a transvenous pacemaker and intra-aortic balloon pump were placed. Her oxygenation did not improve even with FIO₂ of 100 percent, and she required vasopressor support with dobutamine, norepinephrine, and vasopressin. Right heart catheterization showed elevated right atrial pressure of 24 mmHg and pulmonary artery pressure of 35/25 mmHg with wedge pressure of 19 mmHg. She underwent right-sided RP Impella placement, which improved the oxygenation with a decrease in oxygen requirement from FIO₂ of 100 percent to 40 percent. Impella also improved the BP with the successful discontinuation of pressors. Repeat Echo with bubble study showed a right to left shunt, which was absent in the prior echo. There was a significant decrease in the amount of bubbles crossing the atrial septum while on Impella support. Unfortunately, the hospital course was complicated by renal failure, limb ischemia, thrombocytopenia, and multiple episodes of sustained Ventricular tachycardias resulting in the patient's demise.

Discussion:

Our patient developed right ventricular failure with elevated right ventricular and right atrial pressures after right ventricular infarction. This led to the opening of a latent foramen ovale with the shunting of blood from the right atrium to the left, leading to refractory hypoxemia. Her drastic improvement in oxygenation after Impella RP placement suggests that we can use Impella in such patients while awaiting recovery or permanent closure of the PFO. The bubble study confirmed the shunting across the atrial septum, which improved while the patient was on Impella support.

Conclusion:

Right to left atrial shunt across a latent foramen ovale is a rare cause of refractory hypoxemia after right ventricular infarction. Impella RP can be considered in such patients, which helps to offload the elevated right heart pressure decreasing the shunt, thereby providing a bridge to recovery.

Resident/Fellow Clinical Vignette

Manroop Gill

Yizhak Kupfer, M.D., Department of Critical Care Medicine, Kiran Para, M.D., Department of Critical Care Medicine, Maimonides Medical Center

Maimonides Medical Center

Tuberculosis Septic Shock in an Immunocompetent Patient

Tuberculosis affects one third of the world's population and continues to be an important health issue in the United States. Tuberculosis septic shock (TBSS) has a high mortality rate and is important to recognize in the early stages.

A 77-year-old male patient with a past medical history of benign prostatic hyperplasia, and who was a chronic smoker, presented to the emergency department brought in by his family due to shortness of breath. The patient had been short of breath for the past few months along with a productive cough with white sputum. He had high fevers and was hypoxic despite administration of 15 liters of oxygen with a non-rebreather mask. He was subsequently intubated and mechanical ventilation was initiated. Empiric antibiotics for community acquired pneumonia were started with Cefepime and Vancomycin due to high fevers along with intravenous vasopressors for refractory hypotension. The patient was admitted to the critical care unit for septic shock. A post-intubation arterial blood gas revealed a pH of 7.26, PaCO₂ of 63 and PaO₂ of 160 at fractional inspired oxygen of 1.0. The patient's labs on admission were significant for anemia Hg 8.3 g/dL, WBC of 3.0K, bands at 21% and thrombocytopenia with 57,000 platelets. Liver function tests were elevated, with AST 69, ALT 20, and ALP 116. Chest x-ray showed extensive bilateral upper lung opacities that were concerning for tuberculosis. Sputum samples of AFBs and MTBs were sent which were positive. Empiric tuberculosis treatment was started with rifampin, isoniazid, ethambutol, and pyrazinamide.

Additional history also revealed the patient had latent tuberculosis many years ago in China from where he had emigrated. On day 3 of the patient's hospital stay, the patient had a rise in transaminases into the 100s, and all RIPE therapy except ethambutol was stopped. Liver function tests were closely monitored, and rifampin was added back. Despite administration of antibiotics, anti-tuberculosis medications and pressors, patient soon expired.

Patients with septic shock greatly benefit from antibiotics given as soon as hypotension is identified. There is an increase in mortality up to 7.6% for every hour antibiotics are not given in patients with septic shock and up to 1.8% in patients with tuberculosis septic shock. In this case, TBSS was important to recognize early as it has a near 100% mortality rate and administration of anti-tuberculosis therapy in a timely manner is the key to reducing mortality of this fatal disease. Further, it is important to recognize as certain states have a higher prevalence of TB than others including New York where this patient was hospitalized. Taking symptoms and social history into consideration can be essential to determining an early diagnosis of TBSS and early administration of empiric therapy for progression of disease.

Resident/Fellow Clinical Vignette

Nehemias Guevara, MD

2-aEsmirna Perez, 3-aYu, Ming MDMD, 4-aHarry Sequeirab Dr. Ilmana Fulger, MD

SBH Health System

A patient with a triple enemy in the blood that makes waste it, can you guess?

Anemia is the most common hematological disorder, a manifestation of an underlying disease. Its causes are multifactorial, including but not limited to nutritional deficiencies, chronic conditions, inflammatory processes, medications, malignancy, renal dysfunction, hereditary diseases, and bone marrow disorders.

We present a case of a 44-year-old male with alcohol use disorder who was admitted due to fatigue and jaundice. He started having intermittent abdominal pain with anorexia and diarrhea about five months before presentation with a reported 20 lbs weight loss. Symptoms worsened one week before presentation, with fatigue, nausea, vomiting, dark urine, and jaundice.

On physical examination, profound pallor and mild jaundice of skin and mucosae with no peripheral lymphadenopathy were noted. The abdomen exam was remarkable for mild right upper quadrant tenderness, without hepatosplenomegaly or abdominal masses. Laboratory workup was remarkable for pancytopenia with severe anemia (hemoglobin of 2.5), high reticulocyte count, mild transaminitis, severe b12 (cyanocobalamin) deficiency with a level of 8; elevated LDH, and hyperbilirubinemia with indirect bilirubin predominance. Drug urine screen and alcohol were negative.

On peripheral blood smear (PBS), were decreased number of red blood cells (RBC) with RBC agglutinates, anisopoikilocytosis with dacrocytes, rare schistocytes, no polychromasia or nucleated RBC, reduced number of white blood cells with some hyper segmented neutrophils, no toxic granulations, decreased platelets with occasional large platelets, no platelet clumps, no blasts. Furthermore, haptoglobin levels were low and intrinsic factor was high.

Bone marrow aspirate and core biopsy demonstrated hypercellular marrow (90%), showing erythroid hyperplasia and megakaryocyte atypia. Flow cytometry showed no immunophenotypic evidence of a lymphoproliferative disorder or a plasma cell neoplasm.

Cold agglutinin disease was considered given the findings in the PBS; parvovirus IgM and IgG were elevated, with low complement levels (C3 and C4), and direct Coombs were positive. However, the immune workup was negative.

The patient was managed warmer blood transfusions total of 3 units of packed red blood cells, high doses of steroids, and cyanocobalamin of 1000 micrograms daily.

The approach to anemia is challenging, but having three potential causes makes this case very special. First, cold agglutinin is a rare autoimmune disease where one of the causes is parvovirus infection; infection can be asymptomatic or mildly symptomatic and usually does not lead to hemolysis; however, in patients with a predisposition, such as our patient been documented. Our patient had severe b12 deficiency, most likely secondary to long-standing alcohol use disorder and pernicious anemia. Hemolytic anemia has been associated with b12 deficiency linked to intramedullary destruction and high homocysteine levels; however, Coombs is not expected to be positive.

This case is a perfect example of a proper anemia approach and thinking about the uncommon causes with holistic treatment.

Resident/Fellow Clinical Vignette

Maryam Hanoodi, MBChB

Rajendra Shah

Saharat Bhitiyakul

Vassar Brothers Medical Center

A rare case report of Fournier's gangrene due to Empagliflozin

A rare case report of Fournier's gangrene due to Empagliflozin

Maryam Hanoodi¹, Rajendra Shah¹, Saharat Bhitiyakul¹

1.Nuvance Health, Poughkeepsie, NY

Introduction: Fournier's gangrene is a rare but serious rapidly progressing necrotic infection of the scrotum, penis, or perineum. Sodium-glucose cotransporter 2 (SGLT2) inhibitors are effective for glycemic control and have demonstrated cardiorenal effects. Sodium-glucose cotransporter 2 (SGLT2) inhibitors have been associated with Fournier's gangrene.

Case Presentation: We report a case of a 67-year-old morbidly obese female with a past medical history significant for type 2 diabetes mellitus treated with empagliflozin presented with erythema over the left thigh. The patient also has a history of multiple episodes of untreated genital infection. The patient has a history of poorly controlled diabetes mellitus, and empagliflozin was added to her medication three months prior to the presentation. On examination, she was febrile and hypotensive. The perineal examination was significant for erythema extending to the left groin crease and vulva medially, inferior to this perianal area. Labs were significant for leukocytosis and glucose level of 220 mg/dl. CT abdomen pelvis showed subcutaneous edema, skin thickening along the medial left thigh and left buttock, along with foci of gas noted in the subcutaneous fat of the medial left thigh suggestive of Fournier's gangrene. The patient was started on broad-spectrum IV antibiotics and admitted to ICU for septic shock requiring pressors. The patient required emergent exploration and debridement under general anesthesia and vacuum dressing. The hospital course was complicated with multiorgan dysfunction and atrial fibrillation. The patient required a 2-week course of antibiotic antibiotics and was discharged to her home on oral antibiotics. Empagliflozin was held on admission, and she was started on the basal-bolus regimen for glycemic optimization.

Discussion: Sodium-glucose cotransporter 2 (SGLT2) inhibitors have been approved for the treatment of Type 2 Diabetes Mellitus. Sodium-glucose cotransporter 2 (SGLT2) inhibitors lower blood glucose by increasing the excretion of excess glucose through the kidneys and urine. Due to this mechanism, there is a wide clinical spectrum of genital infections associated with SGLT2 inhibitors. Fournier's gangrene is a severe polymicrobial infection that results in necrosis of the perineal and genital fasciae with rapid progression. Sodium-glucose cotransporter 2 (SGLT2) inhibitors have been associated with Fournier's gangrene. This case was significant for presenting Fournier's gangrene in a patient treated with empagliflozin.

Conclusion: Fournier's gangrene can be a side effect of the patient stated on Sodium-glucose cotransporter 2 (SGLT2) inhibitors. Timely cessation of Sodium-glucose cotransporter 2 (SGLT2) inhibitors in individuals with multiple risk factors may help prevent progression to more severe genital infections.

Resident/Fellow Clinical Vignette

Keerthana Haridas, MBBS

Dr Deborah Edelman

Mount Sinai West/ Morningside

Changes in glycemic control and body weight over the course of the COVID-19 pandemic in an urban outpatient setting

Objective: The COVID-19 pandemic has altered health outcomes in populations, not just as a consequence of the acute infection and its sequelae but through a host of downstream social, economic and psychological changes especially among those with chronic non communicable diseases (NCDs). Some studies show that the pandemic led to worsened glycemic control and weight gain in patients. However, contrasting evidence also indicates that many individuals adopted healthier lifestyles leading to improved health outcomes during the pandemic. Thus, various studies present conflicting results in this context. We aimed to carry out a study to explore changes in these metrics in an outpatient setting.

Methods: We conducted a single site observational study at a Federally Qualified Health Center (FQHC) in New York City to compare glycemic control and body weight, measured by Hemoglobin A1c (HbA1c) and body mass index (BMI) respectively, prior to and after the onset of the COVID-19 pandemic. We used data from the years 2015 to 2019 as a baseline for comparison to the years 2020 and 2021, after the onset of the pandemic.

Results: There average annual change in HbA1c from 2018 to 2019 versus 2019 to 2020 was not significantly different (0.23% difference, $p = 0.23$). However, after the pandemic, there was an increase of +3.8% in annual change in average HbA1c from the years prior to the pandemic versus from early 2020 to 2021 ($p < 0.005$). While this is statistically significant, the clinical relevance of this trend will have to be determined. Mean BMI increased over the course of the pandemic, although this was not statistically significant. The slope for the change in BMI over five years prior to the pandemic is -0.09, while the slope of change of BMI before and after the onset of COVID19 is 0.31. The difference between the two slopes is 0.48 ($p = 0.37$).

Discussion/Conclusion: Our study reveals that the COVID-19 pandemic could lead to worsening in the status of NCDs like diabetes, obesity and associated metabolic syndrome due to decreased physical activity, worsened dietary habits, psychosocial stressors and decreased access to healthcare. This emphasizes the need for enhanced support through telemedical and pharmaceutical assistance, accessible healthcare and emotional support to optimize patients' health and decrease burdens on the healthcare system. Concurrently, many individuals practiced healthier ways of living via dietary and activity modifications, with evidence pointing to improvement in certain cardio-metabolic parameters. Further research is necessary to continue to investigate changes in metabolic parameters and associated health outcomes as a far reaching and less explored effect of the pandemic.

Resident/Fellow Clinical Vignette

Syed Hassan, MD

Sharif Ali, MD

Sofia Zahid, MD

Douglas Sepkowitz, MD (Corresponding Author)

New York Presbyterian Brooklyn Methodist Hospital

A Zoonotic Nightmare: Leptospirosis in Brooklyn Puddles

Leptospirosis is a widespread zoonosis implicated in epidemics after heavy rainfalls in tropical regions. Though not typically a North American disease, climate change and the rise of rat populations in US cities during the COVID-19 pandemic highlight a potential public health danger. As it is potentially fatal, this uncommon disease should be tested for if history reveals possible exposure. We present a case of profound multiorgan failure in an NYC park worker.

Patient is a 52 year old male with a history of Bipolar Type-I depression, who presented with five days of fever, sweats, muscle cramps, and fatigue. Initial assessment revealed hemodynamic and lab derangements indicating sepsis, and AFib with RVR, but with negative blood and urine cultures. Physical exam was notable for generalized jaundice with hepatomegaly. His course rapidly worsened to an acute febrile illness with myalgias, headache, and abdominal pain, along with multi-organ failure necessitating ICU care. He had severe thrombocytopenia without schistocytes on peripheral smear, hyperbilirubinemia to 24, and a mild accompanying anemia with normal haptoglobin and reticulocyte values. There was suspicion for a zoonotic illness, but one more severe than tick-borne diseases endemic to the Northeast, and with no recent travel, less likely a tropical source. Further history from family revealed occupational exposures to sewage and floodwater after torrential rains, with no protection employed against contaminated water. A Leptospirosis urine DNA test returned positive; notably, serum PCR for Leptospiral DNA remained negative. Initially on broad-spectrum antibiotics, his therapy was narrowed to Ceftriaxone and Doxycycline, with rapid resolution of his disease.

In New York City, Leptospirosis cases tripled from 2020 to 2021. Historically a tropical illness, climate change and commensalism have made the brown rat (*Rattus norvegicus*) a prevalent reservoir of this spirochete. During the COVID-19 pandemic, meals being cooked at home caused a redistribution of food waste in major US cities and encouraged rodent migration. Sanitation and park employees had increased exposure to rat urine contaminated water and represented almost all Leptospirosis patients at our and nearby hospitals. Current data reveals mortality increasing with age and bacteremia; animal models and in vitro studies reveal worse outcomes from poor recognition of Leptospiral LPS by human TLR4. Our case revealed the importance of avoiding historical biases of disease distribution and the lack of public awareness of barrier protection. Climate factors and rapidly changing human behaviors need to be studied further to reveal epidemic potential of this and other infectious diseases.

Resident/Fellow Clinical Vignette

Negin Hatami, MD

Negin Hatami; Aye Khine; Brandon Coats; Htun Naing

Saint John Episcopal Hospital

Rhabdomyolysis: A Rare Extrapulmonary Manifestation of Mycoplasma Pneumoniae Infection

Rhabdomyolysis: A Rare Extrapulmonary Manifestation of Mycoplasma Pneumoniae Infection

Abstract

Background: Mycoplasma pneumoniae is responsible for approximately 45% of cases of Community-Acquired Pneumonia. M. pneumoniae causes a variety of pulmonary and extrapulmonary manifestations. Rhabdomyolysis is a rare and life-threatening extrapulmonary complication of M. pneumoniae requiring early recognition, prompt supportive management, and treatment with appropriate antibiotics.

Case Summary: Here we present a case of a 60-year-old man with a 4-day history of dyspnea and generalized weakness. His past medical history was positive for hypertension and dyslipidemia for which he was taking clonidine and low dose statin. He denied any recreational drug use. His lab work showed BUN 44mg/dL, Cr 5.4mg/dL, K 6.9mEq/L, and Creatine Kinase (CK) levels were above what could be measured (>160,000U/L). His chest CT scan showed right middle zone consolidation. Investigations showed positive mycoplasma IgM and IgG serology. He was placed on emergency dialysis for rhabdomyolysis driven anuric acute kidney injury and was started on azithromycin for M. pneumoniae. Further probing of his past medical history revealed that he had a similar episode a few years ago where he developed rhabdomyolysis requiring dialysis for a total of 3 months and he was positive for mycoplasma at that point as well. Given this new information, other causes of rhabdomyolysis such as inflammatory myositis and statin-induced myositis were excluded based on diligent history, examination, and opinion from a rheumatologist. Hence mycoplasma-induced rhabdomyolysis was considered the most likely cause. The patient clinically improved but remained dialysis dependent.

Discussion: Rhabdomyolysis is a condition causing necrosis of muscles and release of intracellular muscle constituents into the circulation. CK levels are typically markedly elevated. The clinical sequelae of rhabdomyolysis can vary from asymptomatic disease to electrolyte derangements, and life-threatening renal failure requiring dialysis. Rhabdomyolysis results from ischemia, trauma, high temperature, exertion, drugs, or infections. Among the infections, M. pneumoniae is a rare yet important cause of rhabdomyolysis. In our case, the medical history, imaging findings, positive serology, and clinical response to the appropriate antibiotic support M. pneumoniae as the cause of rhabdomyolysis. Only a few cases have found

rhabdomyolysis as an extrapulmonary manifestation of M. pneumoniae. The severity of rhabdomyolysis in these cases were variable and the highest CK levels were reported by Kaleret al. (49,578) responding to hydration. Our case is unique as the CK levels were higher than the reference lab values (>160,000) and led to anuric renal failure requiring immediate dialysis.

Recommendations: This case highlights the importance of maintaining a high clinical suspicion for rare extrapulmonary manifestations of M. pneumoniae, such as rhabdomyolysis. Clinical history, examination, and appropriate investigations especially mycoplasma serology should be used to establish a diagnosis. Finally, appropriate antibiotics against mycoplasma infection may lead to a better outcome.

Resident/Fellow Clinical Vignette

Negin Hatami, MD

Negin Hatami; Florence Eyenga; and Brandon Coats

Saint John Episcopal Hospital

Bilateral Visual Loss caused by Uremic Optic Neuropathy (UON)- A Rare Manifestation of Renal Failure

Background: Uremic Optic Neuropathy (UON) is a rare complication of renal failure that is diagnosed by exclusion. Visual loss in renal failure can result from a variety of reasons. Prompt recognition and treatment are crucial as delays can make the vision loss permanent.

Case Summary: Here we present a case of a 57-year-old gentleman with PMH of hypertension and chronic kidney disease, who presented with worsening bilateral vision that he had noticed the previous day. He then developed sudden bilateral painless visual loss with a lack of light perception. It was associated with generalized body weakness, and nausea over the past month. The examination was positive for bilateral non-reactive pupils, bilateral vision loss, negative for scalp tenderness and jaw claudication. The patient denied smoking or drinking. He was non-compliant with his nephrology follow-ups and was only taking blood pressure medication. His initial lab work revealed Blood Urea Nitrogen 199 mg/dL, creatinine 28 mg/dL, ESR 126, Haemoglobin 8.8, and negative methyl alcohol. An emergency ophthalmology consultant was requested, and he was started on emergency dialysis and high-dose IV methylprednisolone. He was extensively investigated with MRI and MRA of the head and neck with carotid doppler, temporal artery biopsy, and multiple careful eye examinations. All investigations were negative and ruled out differentials such as bilateral occipital lobe infarcts, Giant Cell Arteritis, and Non-Arteritic Anterior Ischemic Optic Neuropathy (NAION) respectively. Therefore, a diagnosis of UON was made. Based on recommendations from previous literature, he received blood transfusion, high-dose steroids, and additional dialysis. Despite the improvement in uremia, he did not show any signs of visual recovery and was discharged with scheduled outpatient dialysis and ophthalmology follow-ups.

Discussion: UON is a recognized yet rare complication of renal failure. The underlying pathology is poorly understood but likely involves dialyzable toxic metabolites damaging the optic nerve. Anaemia, poorly controlled hypertension, and atherosclerosis are the main predisposing factors. UON is a complication mainly seen in dialysis patients. As in our case, it has been rarely reported as a manifestation of acute or chronic renal failure. As an uncommon diagnosis of exclusion, a multi-disciplinary assessment by a nephrologist, ophthalmologist, and rheumatologist should exclude potential causes. Prompt recognition and therapy with steroids, dialysis, and blood transfusion (for Hb under 8.0) can improve visual outcomes. Unfortunately, in our case, the patient presented late, and his visual loss was irreversible.

Recommendations: Uremic optic neuropathy (UON) is a rare, under-diagnosed, and potentially reversible cause of visual loss in patients with kidney disease. A multidisciplinary input, prompt recognition, and a robust treatment plan dictate outcomes. Also, patients with kidney disease should be educated about this problem to promptly seek medical attention in case of any visual symptoms.

Resident/Fellow Clinical Vignette

Nicole Hunter

Alexander Kusnik MD, Laurie Proia MD

Unity Hospital, Rochester Regional Health

A DANGEROUS CONTAMINANT: A CASE OF STAPHYLOCOCCUS LUGDUNENSIS BACTEREMIA

Introduction

Staphylococcus lugdunensis is a coagulase-negative staphylococcus (CoNS) and is part of normal skin flora. Although it is a CoNS, it can cause serious infections similar to *Staphylococcus aureus*, such as skin and soft tissue infections, native valve endocarditis, bacteremia, and bone and joint infections. We present a case of a 62-year-old man with *S. lugdunensis* bacteremia and possible endocarditis based on the Duke Criteria.

Case

A 62-year-old man with a history of diabetes mellitus, obesity, congenital aortic stenosis, and liver cirrhosis presented with jaundice, fever, and positive blood cultures.

He had been recently admitted to a different hospital 8 days earlier with confusion, stool incontinence, and facial droop for which he received a stroke workup. The patient spiked a low-grade fever, and blood cultures indicated growth of *S. lugdunensis* after 14 hours in 1 of 2 blood cultures. Growth in this blood culture was assumed to be a contaminant.

Repeat blood cultures additionally grew *S. lugdunensis* after 12-13 hours in 2 of 2 cultures. As the patient's mentation improved and he remained afebrile, he was discharged home with close follow-up with his primary care physician (PCP) prior to the results of the repeat cultures. Post-discharge follow-up revealed recurrence of low-grade fevers along with early satiety, worsening jaundice, and tea-colored urine. The patient was therefore referred to our hospital's emergency department for further management.

On presentation to our hospital, he was febrile and tachycardic. Cardiovascular exam revealed a murmur at the second right intercostal space consistent with aortic stenosis. Jaundice, abdominal distension, and bilateral pitting edema were observed. Blood tests revealed leukocytosis of 18,000 mm³, total bilirubin of 11.4 mg/dl, mild transaminitis, and an INR of 2.2. Repeat blood cultures and urine cultures were collected which later grew *S. lugdunensis*. Time to positivity for blood cultures was approximately 18 hours. The patient was started on vancomycin and piperacillin/tazobactam. Ongoing confusion necessitated an MRI head without contrast to exclude potential septic emboli.

Transthoracic and transesophageal echocardiograms (TTE, TEE) were performed and no vegetations were visualized, but TEE indicated prolapse of the left coronary cusp with severe aortic regurgitation, increased compared to prior echocardiogram. He was treated for presumed infective endocarditis and completed a 6-week antibiotic course of intravenous cefazolin and with referral to a cardiothoracic surgeon for aortic valve replacement.

Discussion

Our case signifies the growing importance of *Staphylococcus lugdunensis* bacteremia and the need for microbiological differentiation of coagulase-negative *Staphylococcus*. When *S. lugdunensis* is identified, it is important to regard this species as pathogenic with consideration for complicated or metastatic infection. Patients with *S. lugdunensis* bacteremia may benefit from removing lines/hardware and completing TTE/TEE to rule out endocarditis as the course tends to be severe and destructive.

Resident/Fellow Clinical Vignette

Amna Ijaz, MD

Bianca Leal MD, Prasanta Basak MD, Joseph Casino MD, Bivin Varghese MD

Montefiore New Rochelle Hospital

Large Unilateral Pleural Effusion with Fibrothorax in a Patient with Systemic Lupus Erythematosus

Systemic Lupus Erythematosus (SLE) is a chronic autoimmune disorder with widespread manifestations including pleural and pericardial effusions from serous involvement. Pleural effusions in SLE are commonly bilateral (50% of cases) and mild to moderate in severity. One rare complication of lupus pleuritis is fibrothorax. This case highlights the rare occurrence of a unilateral massive pleural effusion with fibrothorax in an SLE patient.

A 48-years-old African American female with known SLE and lupus membranous nephropathy presented to the hospital with dry cough, dyspnea, and pleuritic chest pain. No fever, joint pains, rash, oral ulcers, or photosensitivity were reported. She endorsed compliance with her home medications including Prednisone and Hydroxychloroquine. Examination was notable for decreased breath sounds over the left lung field. Labs demonstrated baseline hemoglobin, normal leukocytes and platelet count, and slight elevation in creatinine from baseline. Her chest radiograph demonstrated a large left pleural effusion with secondary compression atelectasis and clear right lung. A left pleural catheter was placed for drainage of her symptomatic effusion. Echocardiogram showed normal left ventricular systolic function and a small pericardial effusion. Pleural effusion was exudative with low leukocyte count, normal glucose, and negative gram stain. Serum complement levels were low but higher than past values when she was not in an SLE flare. Similarly, anti-dsDNA levels were high but similar to past values. The erythrocyte sedimentation rate and C-reactive protein levels were elevated. Further pleural fluid analysis revealed no growth on bacterial or fungal culture, negative AFB, negative cytology, and low ADA. QuantiFERON was negative. Computed tomography of the chest revealed trapped left lung and loculated pleural effusion. On video-assisted thoracoscopic surgery, multiple 1-2mm diameter nodules were seen at the left lung base along with adhesive bands and thickened visceral pleura. She underwent removal of fibrous adhesions, pneumolysis, and decortication with postoperative imaging demonstrating significant re-expansion of the left lung. Pleural biopsy demonstrated chronically inflamed pleura with focal acute inflammation. She had no history of hemothorax, recent bacterial pneumonia, or asbestos exposure to explain the fibrothorax. Repeat chest imaging showed interval development of a new right pleural effusion and the patient was started on steroids for serositis of SLE flare. Patient was discharged with the pleural catheter in place. At her follow up appointment, the chest tube was removed and steroids were tapered.

This case illustrates the diagnostic challenge of a large unilateral pleural effusion in SLE patients without typical lupus flare symptoms along with inconclusive laboratory workup. Pleuritis is common in SLE but when the presentation is unusual, an SLE flare should be considered in the differential to properly treat and prevent recurrence of a pleural effusion. It is also important to recognize that fibrothorax is a potential complication in lupus pleuritis.

Resident/Fellow Clinical Vignette

Saad Javaid, MD

Joseph Dayrit, BS, Nazaneen Aflak, BS, Yoshua Quinones, MD, Susan Ramdhane, MD, Shazhad Iqbal, MD, Scott Wolfe, DO, Wyckoff Medical Center, Department of Pathology

Wyckoff Heights Medical Center, NY

LINITIS PLASTICA MASQUERADING AS ACUTE PANCREATITIS

Introduction

The diagnosis of Linitis Plastica not only poses a challenge because of its atypical presentation of vague symptoms such as dysphagia, weight loss, and abdominal pain, but once diagnosed its rapid progression and aggressive course is associated with high mortality and poor quality of life. We describe a case of a patient who had an unusual presentation of what initially appeared to be benign disease of the pancreas later revealed to be advanced malignancy.

Case Presentation

A 36 year old male, PHx pancreatitis, presented with abdominal pain and diarrhea. Vitals were stable. Labs showed WBC normal, lipase 2569U/L, alk phos 888U/L, AST 432 U/L, ALT 499U/L, TB 2.9, DB 1.6U/L. CT scan(Fig A) showed peripancreatic fluid and stranding, intra and extrahepatic biliary duct dilatation, irregular thickening of the gastric wall and possible colitis. U/S and HIDA were negative. Treatment was initiated for acute pancreatitis until the patient developed jaundice TB 14U/L, DB 11U/L and leukocytosis WBC 17.9K/UL. Suspecting cholangitis, EGD/ERCP was performed. EGD noted non-distensible "water-bottle" stomach, congested mucosa and a 17mm clean-based ulcer at the greater curvature(FigB). Groove pancreatitis was noted. Both PD and CBD cannulation were unsuccessful due to significant congestion. EUS showed a 27mm hypoechoic and heterogeneous mass at the GE junction and cardia involving the pleura staged T4(FigC). Pathology confirmed poorly differentiated adenocarcinoma 'Linitis Plastica' through multiple areas of the stomach: HER2/neu:0/negative, PD-L:CPS<1. Transhepatic PTC and biliary drain was placed for biliary decompression and fluid cytology obtained confirmed multiple clusters of cells with moderate to severe nuclear atypia and occasional signet ring morphology. Unfortunately, a few days later the patient expired.

Discussion

Review of the literature have noted Linitis Plastica's "unusual presentations" as metastasizing primary cancers infiltrating the stomach mimicking linitis plastica, but none have highlighted Stage IV gastric cancer initially presenting as pancreatitis. Several mechanisms can be proposed including "mass effect" with edema in the groove, inflammatory cascade amplified by COVID or a new paraneoplastic syndrome involving pancreatic inflammation due the primacy gastric malignancy. Whatever the mechanism was in our patient, further research, investigation and awareness is needed to recognize an earlier diagnosis for primary linitis plastica patients who present as acute pancreatitis.

Resident/Fellow Clinical Vignette

Tina Kana

Wright, Janell

St Mary's General Hospital

Case Report on Sporadic Hemiplegic Migraine

An uncommon presentation of a migraine headache is hemiplegic migraine, which can clinically imitate other conditions including transient ischemic attacks and stroke with unilateral muscle weakness or hemiplegia. Patients present with severe headache, photophobia, numbness, tingling, paresthesias, dysarthria and temporary muscle weakness which can last from minutes to days. Migraine associated with hemiplegia is a rare presentation and minimal data is available in terms of pathophysiology and treatment of sporadic hemiplegic migraine. We present a 46-year-old female patient with no significant past medical history who was admitted with symptoms of unilateral occipital headache, dysphagia and left sided motor weakness, which began 4 days before initially presenting to the ED. She noted that there was a gradual onset of the headache, which was described as a throbbing sensation. The patient tried ibuprofen without alleviation of symptoms and denied trauma or any loss of consciousness. She developed right eye pressure and right sided facial tingling in the morning which prompted her visit. Patient denied fevers, chest pain, extremity weakness, abnormal gait, recent travel, or insect bites. On physical examination the patient was able to speak in full sentences but left facial asymmetry was present. Lyme serology was performed, and negative results were obtained. Brain tomography results were normal, and the patient was given Toradol, solumedrol and Reglan. The patient's symptoms improved over the next hour, and she was discharged with a diagnosis of Bell's palsy. She was prescribed oral prednisone and acyclovir at the time of discharge. 10 days later, the patient presented with left sided occipital headache and increasing weakness and numbness in her left upper and lower extremities. She also reported left sided facial pain, nausea, dysphagia, paresthesia, and blurry vision in her left eye. On physical examination, vitals were unremarkable. Neurological examination revealed that the patient's right upper and lower extremity strength was 5/5 and the left upper and lower extremity strength was 3/5. Romberg, shin to heel, pronator drift and Babinski testing were negative and two-point discrimination was intact. Additionally, reflex testing was normal. Lab results were unremarkable, except for suboptimal B12 levels. Diffusion magnetic resonance (MRI) imaging and brain tomography results were normal. A diagnosis of sporadic hemiplegic migraine was made after extensive workup and managed conservatively with solumedrol. The patient was discharged on prednisone and tetrahydrozoline ophthalmic solution with a drastic improvement in symptoms.

Resident/Fellow Clinical Vignette

Avleen Kaur, MBBS

Bala Pushparaj; Husnain Waseem

Maimonides Medical Center

A Case of Occult Episodic Gram-Negative Bacteremia after Whipple's procedure

Introduction :

Pancreaticoduodenectomy (P.D.) is a complex surgery with significant postoperative complications. We present a case of recurrent gram-negative bacteremia after P.D. resulting in multiple readmissions.

Case description:

A 57-year-old man had P.D. with biliary stenting due to pancreatic adenocarcinoma. Six months later, the patient presented with fever, epigastric pain, and weight loss. Labs revealed elevated alkaline phosphatase (ALP). C.T. scan revealed mild intrahepatic biliary dilatation without residual malignancy. Sepsis workup revealed E. coli bacteremia with an unknown source. He was managed conservatively with intravenous antibiotics. One year later, he had another episode of sepsis with obstructive jaundice. Blood cultures grew drug resistant Proteus Mirabilis without any identifiable source. He was treated with proper antibiotics, and a repeat ERCP was performed to remove the biliary stent. The patient was admitted four times in the next two years with gram-negative bacteremia. During his most recent hospitalization, MRCP showed dilated common bile duct measuring up to 1.0 cm with focal narrowing at the hepaticojejunostomy site, concerning stricture at this location. Reflux cholangitis secondary to PD was considered a potential source of recurrent bacteremia. The patient is currently scheduled for revision surgery and stricture dilatation.

Discussion:

Sepsis after PD may develop in up to 25% of the patients. The proposed pathophysiology may be the development of a motility disorder in the mobilized Roux-en-Y loop resulting in reflux of intestinal content into the biliary tree. The loss of the sphincter of Oddi also results in increased reflux. The recurrent reflux episodes result in anastomotic stricture development in 4–10% of cases. A study reports 21.1% incidence of post-P.D cholangitis with a higher incidence within two years after surgery and suggests that an ALP ≥ 410 IU/L predicts late postoperative cholangitis. Conservative therapy such as fasting, and administration of antibiotics is commonly performed. However, early interventions should be considered with either endoscopic stricture dilatation or lengthening of Roux-en-Y limb to limit the reflux. In this case, we emphasize early consideration of reflux cholangitis as a possible source of recurrent bacteremia to decrease the postoperative morbidity and readmission rate.

Resident/Fellow Clinical Vignette

Omair Khan, MBBS

Tiffany Lu MD

Joshua Shapiro MD

Syed Mohammad Mazhar Uddin MBBS

Saipriya Vasudevan MBBS

Maimonides Medical Center

Pseudo hyperaldosteronism secondary to herbal medicine use.

Introduction: Licorice is a commonly used flavoring agent in food and health products, including herbal medicines. We report the case of a Chinese man who initially presented with resistant hypertension and hypokalemia refractory to therapy and was later diagnosed with pseudo hyperaldosteronism secondary to licorice toxicity.

Case presentation: A 56-year-old Chinese man with a history of hypertension was admitted due to profound hypokalemia of 2.3 mEq/L found during outpatient workup. The patient endorsed 10 days of dizziness and weakness to the point where he had difficulty standing up. The patient was diagnosed with hypertension 10 years ago however over the last year, his PCP changed his anti-hypertensives multiple times due to poor control despite complete medication compliance. His current medication regimen included hydrochlorothiazide (HCTZ), losartan, labetalol and nifedipine. In the Emergency department, the patient's vital signs revealed blood pressure of 170/100 mm Hg, heart rate of 90 beats/minute, and respiratory rate of 22. His physical exam was unremarkable. Significant laboratory results included potassium of 2.3 mEq/L with metabolic alkalosis and creatinine of 1.4 mg/dl. EKG showed sinus rhythm. On admission hydrochlorothiazide and losartan were held due to hypokalemia and acute kidney injury. The spot urinary potassium level was 45 mmol/L and the calculated trans-tubular potassium gradient indicated renal potassium wasting. Plasma aldosterone level was 15 ng/dl and plasma renin was 2.1 ng/dl with a ratio less than 20 :1, ruling out primary hyperaldosteronism. Normal levels of cortisol, creatine phosphokinase, thyroid stimulating hormone, and plasma metanephrine, along with a normal renal artery doppler study ruled out secondary causes of hypertension. Upon further investigation, the patient's wife revealed he had been taking "Niu Huang Jie Du Pian", a Chinese herbal medicine, for many years but increased its usage over the past year because of throat aches. One of the main ingredients of this herbal medicine was licorice root, a notorious cause of pseudo hyperaldosteronism. Over the following days, the patient's blood pressure was managed with medication and potassium levels were repleted. He was later discharged once his blood pressure, potassium, and creatinine levels returned to baseline. The patient was also counseled to discontinue the herbal medicine.

Discussion: Chronic ingestion of licorice induces a syndrome with findings like that seen in primary hyperaldosteronism. These clinical manifestations are attributable to glycyrrhizic acid and its inhibition of 11 beta-hydroxysteroid dehydrogenase, thus preventing the conversion of cortisol to its inactive form, cortisone. Licorice-induced mineralocorticoid excess is reversible following cessation, and the recovery time is often a few days.

Conclusion: As a physician, working with a diverse and multicultural patient population, it is essential to do a thorough medication reconciliation and educate patients on the risks of herbal/over-the-counter supplements to avoid adverse side effects

Resident/Fellow Clinical Vignette

Asees Khan

Asees Khan, Bilal Niazi, Daniella Barber

Nassau University Medical Center

A Rare Case of Bleeding due to Pancytopenia in the setting of Chronic Low Dose methotrexate

Introduction

Methotrexate is a disease-modifying antirheumatic drug that can be used chronically in low doses for rheumatic conditions. Though methotrexate most commonly causes leukopenia, anemia, or thrombocytopenia alone, pancytopenia is a rare and critical sequela that needs to be diagnosed and treated promptly. Here we present a rare case of acute bleeding found in a patient with pancytopenia who had been taking methotrexate chronically in low doses. Upon discontinuation of methotrexate and supplementation of folic acid, the patient had complete resolution of bleeding and pancytopenia. Here we highlight the importance of maintaining a high level of suspicion for methotrexate as a potential cause of pancytopenia.

Case Presentation

An 87-year-old female presented with a 2-week history of worsening gingival bleeding associated with light chewing. Her past medical history was significant for rheumatoid arthritis and she had been taking methotrexate 2.5 mg oral tablets weekly for over 10 years. She denied any history of tobacco, alcohol, or recreational drug use.

Vital signs were normal. She did not appear in acute distress and was hemodynamically stable. Pertinent examination findings included pale conjunctiva, blood-tinged oral mucosa, and swan neck deformity of bilateral fingers. Labs revealed WBC 0.9 k/uL, Hgb 8.4 g/dL, Plt 47 k/uL, MCV 105.2 fL, Iron 70 ug/dL, TIBC 186 ug/dL, ferritin 605.1 ng/mL, reticulocyte count 1.58 %, B12 768 pg/mL, folate 8 ng/mL. Her PT, aPTT, and INR levels were within normal limits. CT chest/abdomen/pelvis did not reveal any evidence of malignancy. A bone marrow biopsy was performed which did not reveal any morphologic or immunophenotypic evidence of acute leukemia, plasma cell neoplasm, or lymphoma. Flow cytometry did not reveal any evidence of lymphoproliferative disorder, acute leukemia, increase in blasts, or plasma cell neoplasms. The patient's methotrexate was held, daily folic acid supplementation was started, and 1 unit each of packed red blood cells and platelets were administered. By the second day of admission, her mucosal bleeding was completely resolved and her WBC, Hgb, and Plt levels improved to normal limits and remained stable through the remainder of her 5-day hospital course.

Discussion

Methotrexate is an important DMARD used chronically at low doses for rheumatic conditions that can rarely cause leukopenia, anemia, or thrombocytopenia. More rarely, pancytopenia can occur causing serious implications such as infection and bleeding. Here we present a patient who presented with gingival bleeding found to have pancytopenia secondary to methotrexate use. With the discontinuation of methotrexate and folate supplementation, her bleeding resolved and pancytopenia improved. We hope to increase awareness of methotrexate as a possible cause of acute bleeding in the setting of pancytopenia to avoid delays in treatment.

Resident/Fellow Clinical Vignette

Omar Khan, MBBS

Kevin Clements MD ; Sanjay Maheshwari MBBS ; Pranay Siriya MBBS ; Syed Mohammad Mazhar Uddin MBBS ; Patricia Park MD ; William Pascal MD

Maimonides Medical Center

Diagnosis of adrenocortical carcinoma with hypercortisolism in a patient with hypokalemic metabolic alkalosis

Introduction:

Internists often encounter patients with electrolyte derangement and are expected to have a thorough understanding of it. A broad understanding of the causes behind such abnormalities and the ability to formulate a wide range of differentials is essential for optimum treatment. We present the case of a patient with severe hypokalemia secondary to an adrenal mass which was ultimately diagnosed as adrenocortical carcinoma (ACC).

Case report:

A 57-year-old man with schizoaffective disorder and recently diagnosed with hypertension came to the emergency department after a fall. Vital signs were normal except for a blood pressure of 140/100 mmHg. Labs showed serum potassium of 1.8 mmol/L and metabolic alkalosis. Potassium was replaced and the patient was started on spironolactone and lisinopril per nephrology's recommendations. The patient subsequently developed hypoxia and abdominal pain, so computed tomography was ordered. The scan showed a right-sided adrenal mass measuring 15.5 x 9.8 x 16.2 cm. Work-up of the mass revealed a normal serum aldosterone level (7.7 ng/dL) and direct renin level (9.1 pg/mL) with a ratio of 0.85, ruling out primary hyperaldosteronism. Serum cortisol was elevated to 47.8 ug/dL, and after the dexamethasone suppression test, was 48 ug/dL. His adrenocorticotrophic hormone level was < 1.5 pg/mL, suggesting hypercortisolism. Other significant labs included DHEA sulfate elevated to 520 ug/dL and 17-hydroxyprogesterone elevated to 310 ng/dL, with worsening diabetes mellitus (hemoglobin A1c increased from 6% to 9% over 6 months). Interventional radiology was consulted to biopsy the adrenal mass after pheochromocytoma was ruled-out, which confirmed the diagnosis of ACC, a myxoid variant. Immunohistochemical staining (Inhibin+, Melan-A+, Calretinin+, Synaptophysin+) supported an adrenocortical phenotype. Urology was consulted regarding resection, but due to locally advanced malignancy with extension into the liver and inferior vena cava, the decision was made not to proceed due to high morbidity and mortality. He was planned for chemotherapy with mitotane and further treatment outpatient but died within 6 months.

Discussion:

ACC is a rare malignancy, with an estimated annual incidence of 0.7-2 cases per million. Most patients present with steroid hormone excess or abdominal mass effects, but 30% of patients with ACC are diagnosed incidentally. A careful history, physical exam, and pertinent lab investigations are necessary to reach the diagnosis. Surgical resection is the cornerstone of treatment in localized ACC; however, chemotherapy with mitotane is preferred in patients with widespread disease or those who are not surgical candidates. Prognosis is poor with survival rates between 15-40%.

Conclusion:

In medicine, things are not always what they seem. A seemingly simple case of a fall turned out to be a life-changing fatal malignancy. It is therefore paramount that internists always keep an eye on the broad differential diagnosis while dealing with electrolyte derangements to ensure high-value care.

Resident/Fellow Clinical Vignette

Sneha Khanal, MD

Abhishrut Jog, Fellow, Department of Pulmonary Medicine, BronxCare Health System, Bronx, New York, United States of America

Misbahuddin Khaja, Attending Physician, Pulmonary and Critical Care Medicine, BronxCare Health System, Bronx, New York, United States of America

BronxCare Health System

Completing the triad of Austrian Syndrome

Austrian syndrome, rather infamously known as the Osler triad, is a clinical syndrome consisting of a triad of pneumonia, endocarditis, and meningitis. The most common causative organism isolated for the Osler triad is *Streptococcus pneumoniae*. This down-spiraling infectious cascade has been associated strongly with heavy alcohol dependence. The diagnosis remains challenging due to variations in clinical presentation and unpredictable time to symptom onset. Here we present a case of a challenging diagnosis of the Austrian syndrome.

A 58-year-old male with a long-standing history of heavy alcohol abuse presented to the emergency department with a 2-day history of fever, flu-like symptoms, and altered mental status. Vitals were significant for high-grade fever, tachycardia, and elevated blood pressure. On physical examination, the patient was non-verbal due to altered mentation and had neck stiffness and a petechial rash over the chest. Labs indicated sepsis with lactic acidosis and leukocytosis. CT chest showed bibasilar lobar pneumonia worse on the right side, with trace parapneumonic pleural effusions, cardiomegaly, and splenomegaly. A lumbar puncture was suggestive of bacterial meningitis, with elevated segmented WBC count, elevated CSF protein and CSF lactic acid, and borderline decrease in CSF glucose. The patient had a positive *Streptococcus pneumoniae* urine antigen test. Blood cultures revealed *Streptococcus pneumoniae* bacteremia. A transthoracic echocardiogram (TTE) was initially negative for valvular vegetations. Subsequently, the patient developed new-onset atrial fibrillation and was started on metoprolol and anticoagulation with apixaban. The patient's mental status improved with treatment for *S. pneumoniae* and was discharged home after fourteen days of intravenous ceftriaxone therapy. The patient was readmitted shortly thereafter with shortness of breath that rapidly progressed to acute hypoxic and hypercapnic respiratory failure requiring mechanical ventilation. The patient was treated for septic shock requiring vasopressors and had multiple episodes of atrial fibrillation with rapid ventricular response. On repeat TTE, severe aortic insufficiency with an aortic valve vegetation was noted. This finding completed the triad of Austrian syndrome. The patient underwent successful aortic valve replacement and completed antibiotic treatment for infective endocarditis, secondary to *S. pneumoniae* infection. The patient returned to baseline functional status and was asymptomatic during follow-up visits.

A high index of clinical suspicion, especially among the at-risk population, is vital to the diagnosis of the devastating Austrian syndrome. Variations in the presentation can easily cause one of the limbs of the triad to be unaccounted for. Rapid clinical decompensation can ensue in such cases. Hence, vigilant investigation and timely intervention can help physicians reduce the high incidence of mortality and morbidity for this syndrome.

Resident/Fellow Clinical Vignette

Yassine Kilani, MD

Ebehiwele Ebhohon, Iqra Arshad, Adnan Al Jafari, Priscila Ioma Castro Puello, Richa Aggarwal

Lincoln Medical and Mental Health Center

AN ALMOST MISSED CASE HEPATITIS E VIRUS INFECTION

BACKGROUND

According to the CDC, Hepatitis E virus (HEV) is not commonly acquired in the United States (US), while it is the most common causal agent of viral hepatitis worldwide. HEV Genotype 1 and 2 infections are waterborne from drinking water contaminated by feces from people who are infected with the virus and causes epidemics in the tropics. In the US it's mainly the genotypes 3 and 4 infections which are zoonotic that spread by ingestion of raw or undercooked pork, venison, and wild boar meat. CDC recommends testing for HEV infection in patients with symptoms of viral hepatitis or unexplained liver injury, who test negative for serologic markers of hepatitis A, hepatitis B, hepatitis C, and other hepatotropic viruses, regardless of travel history.

CASE PRESENTATION

A 61 year old male with a history of alcoholic liver disease, and esophagitis secondary to alcohol use, presented with coffee ground emesis, diarrhea, and burning epigastric pain. He denied any travel history. His temperature was 98.6 °F, heart rate was 114/min, and blood pressure was 142/89 mmHg. Physical examination was significant for scleral icterus, generalized abdominal tenderness, without rebound and guarding. His laboratory workup was significant for marked elevation of aspartate transaminase 4885 U/L and alanine transaminase 892U/L, elevated bilirubin (total bilirubin 2.06 mg/dL direct bilirubin 0.8 mg/dL) and white blood cell count 7240/mcL (85.5% neutrophils), and normal Prothrombin time 12.1 seconds. Based on his history, pattern of hepatocellular liver injury, and negative serologic markers for Hepatitis A, B, C and D, the diagnosis of alcoholic hepatitis was considered. Patient was managed supportively, and over the course of days, his liver function normalized and he was discharged. A follow up visit was arranged for endoscopy. However, following discharge, our patient's test result came back positive for Hepatitis E IgM antibody, which indicated the diagnosis of acute HEV infection.

DISCUSSION

Hepatitis E diagnosis can easily be overlooked in the US due to its low prevalence. Any patient presenting with unexplained liver injury should be considered and tested for acute HEV infection. Because cases of hepatitis E are not clinically distinguishable from other types of acute viral hepatitis, diagnosis can be confirmed only by serologic testing (HEV antibodies IgM). Treatment is supportive. There is no specific antiviral therapy for acute hepatitis E and no FDA-approved vaccine for hepatitis E is currently available. It's important to know that although it's rare, domestically acquired Hepatitis E virus cases do occur in the US. HEV can lead to severe complications in pregnant women and in people with preexisting chronic liver disease and organ transplant recipients on immunosuppressive therapy resulting in decompensated liver disease and death.

Resident/Fellow Clinical Vignette

Sungsoo Kim, MD

Westchester Medical Center

Debilitating Calf Pain

39-year-old woman with hypertension, hyperlipidemia, type 2 diabetes, obesity status post sleeve gastrectomy, gastroesophageal reflux disease, chronic lower back pain, and severe osteoarthritis of the right hip complicated by avascular necrosis presented with bilateral burning calf pain for 2 weeks. She first noticed the pain while walking. She had been exercising more in recent weeks to lose weight and undergoing physical therapy for her hip osteoarthritis. The pain was localized to the calves without radiation and described as burning or stabbing. The right side was slightly worse than the left. She reported some relief with rest. On exam, there was tenderness to palpation of the calves and on plantar and dorsiflexion. There was no swelling or erythema. No masses or nodules were appreciated. Home medications included norethindrone, lisinopril, atorvastatin, metformin, and omeprazole.

Initial differential diagnosis included neuropathy secondary to uncontrolled diabetes or vitamin deficiencies, muscle spasms, and deep vein thromboses. A lower extremity ultrasound study was negative for deep vein thromboses. Early measures with over-the-counter pain medications and warm compresses failed. Electromyography showed mild sensory neuropathy. Hemoglobin A1c was elevated to 8.4%. Vitamin C and thiamine levels were low. However, despite vitamin repletion and gabapentin, the pain worsened. Over the course of a few months, she became wheelchair dependent due to excruciating pain, at which point she was hospitalized to expedite workup.

Because of mild elevations in inflammatory markers and creatinine kinase, atorvastatin was stopped for a brief period due to concern of statin-induced myositis. Autoantibodies for myositis and ANCA vasculitis including ANA, anti-SSA, anti-SSB, anti-PR3, and anti-MPO came back negative. MRI of the lower extremities on T2-weighted images revealed significant bilateral muscle edema/enhancement. Subsequent biopsy of the right gastrocnemius muscle showed involvement in a necrotizing vasculitis, suggestive of polyarteritis nodosa. Though isolation to a single organ is rare for the disease, the tissue biopsy was definitive, and she was started on prednisone. Steroids greatly improved her pain and mobility. Although she later did not tolerate methotrexate, the plan is now to try cyclophosphamide.

This case illustrates the importance of entertaining a wide differential diagnosis and the need to quickly escalate in obtaining a tissue diagnosis when met with equivocal laboratory and imaging studies. The presentation was atypical for polyarteritis nodosa, which is known as a systemic necrotizing medium-vessel arteritis, often affecting multiple organs. Nevertheless, recognition of this rare subset of the disease is crucial in swiftly diagnosing with a biopsy and instituting appropriate therapy to prevent debilitating pain.

Resident/Fellow Clinical Vignette

Vikash Kumar

Vikash Kumar MD (Presenting Author), Sohrab Singh MD, Simon Lukose DO, Naresh Kumar MD, Saka Kazeem MD, Viswanath P. Vasudevan, MD

The Brooklyn Hospital Center

Insulin autoimmune syndrome or Hirata's Disease: A rare cause of hypoglycemia in non-diabetic patients

Introduction

Insulin autoimmune syndrome (IAS) or Hirata's disease is a very rare cause of hypoglycemia presenting with recurrent fasting or postprandial hypoglycemia episodes with elevated serum insulin levels and normal/elevated C-peptide. It is characterized by presence of insulin autoantibodies (IAA) or insulin receptor antibodies in the absence of prior exposure to exogenous insulin and islet pathologic abnormalities. Insulin-IAA complex formation contributes to the development of IAS and results in double-phase glycemc changes: Insulin is released from the complexes regardless of blood glucose levels, which causes hypoglycemia. IAA blocks insulin from binding to its receptor in the postprandial phase, which may result in moderate hyperglycemia. We present an interesting case of an 81-year-old female who presented with hyperinsulinemic hypoglycemic episodes without any apparent risk factors for IAS. She had positive insulin autoantibodies leading to the diagnosis of IAS.

Case Presentation

An 81-year-old female with a past medical history of hypertension and coronary artery disease presented with episodes of hypoglycemia, occurring mainly after meals. She had no history of diabetes mellitus or previous exposure to insulin or oral antidiabetic agents. The finger stick glucose on presentation was thirty-nine. Hypoglycemia was managed with dextrose pushes, oral glucose, and glucagon injection for persistent hypoglycemia. Hypoglycemia workup included beta-hydroxybutyrate (BHOB), cortisol, and ACTH were within normal limits. Plasma hypoglycemic agents, including sulfonylurea and meglitinide screen were negative. Labs were significant for elevated insulin to 1345 nmol/L with normal C- peptide of 2.64 nmol/L. CT scan of the abdomen was negative for pancreatic mass. Repeat insulin levels during hypoglycemia episodes were elevated to 2247 nmol/L and C- peptide 4.14 nmol/L. Insulin autoantibody was elevated to 50.0, and insulin remained persistently elevated to 2769 nmol/L. The patient was managed with diet education, steroids and continuous glucose monitoring, resulting in the resolution of hypoglycemia. The patient was scheduled for outpatient follow-up for further management and to evaluate for persistent symptoms.

Discussion

IAS should be considered as a differential diagnosis in patients presenting with hypoglycemia secondary to endogenous hyperinsulinemia. The gold standard diagnostic test for IAS is the measurement of insulin autoantibodies. Clinician awareness of IAS can lead to prompt diagnosis without the need for costly imaging techniques or invasive surgical procedures. The first-line treatment for IAS is foods with a low glycemic index. These foods don't lead to postprandial hyperglycemia therefore, suppressing the stimulus secretion of endogenous insulin. Additionally, steroids can be potentially added as an adjunct therapy. However, the role of Rituximab is still needed to be further studied. Our case describes the classical presentation of IAS with hypoglycemic episodes secondary to elevated insulin levels and positive serum insulin autoantibodies. Interestingly, our case had no apparent risk factors for the development of IAS.

Resident/Fellow Clinical Vignette

Pyae Kyaw, MBBS

Dr Shetty, V (MD)

Dr Pushparaji, B (MBBS)

Department of medicine, Maimonides medical center

A case of Dermatomyositis with the Anti-Synthetase Syndrome with anti PL7 (+) and anti Jo1 (-)

Introduction: Anti-synthetase syndrome is characterized by myositis, Interstitial lung disease (ILD), Raynaud's phenomenon, and polyarthritis. The workup of the condition includes Electromyography (EMG), inflammatory markers, specific autoantibodies testing, imaging studies, and ultimately muscle biopsy. We present a clinical vignette of anti-PL7 (+) anti-synthetase syndrome with lung complications.

Case-Presentation: 68-year-old female with past medical history of hypertension presents with a 10-months history of rash, pruritis, flat, without plaques, dark red, starting from her face and progressing to upper extremities, chest, back, abdomen, and lower extremities. Three to four months history of myalgias, proximal muscle weakness, & bilateral knees and shoulders pain. Dyspnea with exertion and 40 pounds of weight loss over four months. The patient had clear lung sounds during the initial encounter. EMG and nerve conduction study showed inflammatory myopathy. Skin biopsy showed spongiotic dermatitis. Initial differential diagnosis included Dermatomyositis as well as rheumatologic myositis. Labs revealed CK 317 U/L, aldolase 9.9 U/L, anti-PL-7 (+), ESR 79, CRP 2 mg/L, ANA (+) >1:1280. The following were negative: SSA/SSB, Hep B, T4/TSH, anti-jo 1, C3/C4, Anti-CCP, anti-dsDNA, RF, HCV, HLA B27. CRP. Smith, Anti-scleroderma-70, anti-centromere B, anti-ribosomal P, antichromatin, rest of myopathy panel. CT Chest/Abdomen/Pelvic revealed multiple retro pectoral, axillary, and inguinal lymph nodes, Mild ground-glass attenuation with superimposed reticulation scattered throughout both lungs, with peripheral predominance. Mild bronchiectasis, most pronounced in RLL. MRI of the thigh and shoulder showed extensive edema of the muscles and axillary and inguinal lymphadenopathy. Occult Malignancy was ruled out by a PET scan. Biopsy of the left vastus lateralis muscle revealed features of inflammatory myopathy with perifascicular pattern of myocyte injury and extensive inflammatory infiltrates in the perimysial and epimysial connective tissues. Final diagnosis of Dermatomyositis with the anti-synthetase syndrome was made. Patient was treated with 5 mg of Prednisone every other day, Mycophenolate mofetil and Hydroxychloroquine. She gradually responded to the treatment and was able to ambulate soon after. The patient continues to follow up regularly with her rheumatologist and pulmonologist.

Discussion: The majority of the patients with PL7 (+) anti-synthetase have interstitial lung disease (ILD). Early detection of lung involvement and early treatment with immunosuppressive medications may reduce the lung damage caused by the syndrome.

Conclusion: Anti-synthetase syndrome is a rare condition in patients with Dermatomyositis or Polymyositis, who develop ILD and other systemic inflammatory conditions. Early diagnosis and management are essential for timely treatment, delaying the progression of ILD with immunosuppressive medications, and improving the patient's quality of life.

Resident/Fellow Clinical Vignette

Muhddesa Lakhana, DO

Muhddesa Lakhana DO, Vivianne Sambour MD, Daniel Kurbanov MD.

Mount Sinai South Nassau

It can't B!: An unusual case of *Streptococcus agalactiae* (Group B) Empyema necessitans

Introduction/ Abstract:

Empyema necessitans is an empyema that extends from the lung pleura into the chest wall and underlying tissue. This is a rare complication and is more commonly associated with mycobacterium tuberculosis and actinomyces than with typical community acquired organisms. Symptoms include pleuritic chest pain, crepitus, and occasionally a bulging mass in the chest wall. Treatment includes antibiotics targeted for the specific bacteria, and in severe cases chest tube placement and often surgical intervention such as decortication of the lung parenchyma. We present a rare case of *Streptococcus agalactiae* (Group B) empyema necessitans in an adult male. This case highlights the diagnosis and management of Empyema necessitans in the modern era.

Case Presentation

A 61-year-old male presented to our hospital with acute abdominal pain with hematemesis for one day and reported one week of right shoulder pain and right anterior "fullness" in his chest. Significant past medical history included former tobacco smoking with cessation thirty years ago, throat cancer status post chemoradiation, syndrome of inappropriate antidiuretic hormone secretion previously on tolvaptan, gastroesophageal reflux disease.

At presentation, vital signs were as follows: Initial blood pressure of 141/62, and subsequently 95/69. Heart rate was 83 beats a minute. Oxygen saturation was 97% on room air. Temperature 98.4 F. Physical exam revealed a hoarse voice, and vesicular breath sounds bilaterally on lung auscultation. Laboratory data were significant for mild leukocytosis. Initial chest radiograph did not show focal airspace opacities or pleural effusions. EKG revealed a new left bundle branch block and patient then underwent cardiac catheterization which was negative. However, he continued to have right shoulder pain.

Management:

A right shoulder radiograph was obtained which revealed a lung mass. Further investigation with computed tomography (CT) of the chest revealed a 6.5x3.8cm complex right upper lobe (RUL) lung mass with air within the right pectoral muscles. CT-guided drainage was performed by interventional radiology with 15 cc of purulent matter aspirated. The fluid culture grew Group B streptococcus (GBS). He was placed on Ampicillin / Sulbactam once sensitivities resulted. A thoracic surgery consultation was requested, and the initial plan was for surgical intervention, however the patient self-removed the drain and declined surgery.

Result:

A multidisciplinary discussion involving infectious disease consultants, pulmonologists, and thoracic surgeons was held. The patient was discharged with a plan for six weeks of Ampicillin / Sulbactam and repeat chest imaging in four weeks.

Empyema necessitans should remain a consideration, as a potential complication of pleural space infections, and may have an insidious presentation as well as atypical risk factors and microbiologic etiology.

Resident/Fellow Clinical Vignette

Juan Martinez Zegarra, MD

Amado Estrada Fernandez: Medical Student Candidate
St. George's University School of Medicine

Wyckoff Heights Medical Center

Breaking Barriers Between Patients and Healthcare Professionals: An Introductory Medical Spanish Online Course

Background:

Physician-patient language concordance is critical to provide a better quality of care and to decrease medical errors. According to the AAMC, in 2018 less than 6% of active physicians spoke Spanish [1]. The Hispanic or Latino population grew 23% from 2010 to 2020, which is a total of 62.1 million in 2020[2]. The development of this course aims to enhance healthcare delivery by increasing the confidence of the healthcare professional to effectively gather pertinent patient medical history, perform a physical exam, and develop a rapport in Spanish. This online course emphasize is in collaborative learning methods where Spanish speaker fellow classmates work together to teach their peers using free audiovisual material.

Methods

The course framework follows Bloom's taxonomy and is delivered in an interactive environment that simulates real-life clinical scenarios allowing the students to learn, practice, and reinforce their clinical knowledge in Spanish. It is delivered over 10 one-hour sessions including grammar, anatomy, cultural competency, and standardized patient case videos with Spanish/English scripts. The videos adhere to the former standard United States Medical Licensure Examination Clinical Skills (USMLE Step 2 CS) vignette format. Standardized checklist was used to evaluate performance in the participants in an online format evaluation. Comfort in Spanish proficiency was evaluated via a pre- and post-course 5-point Likert scale survey. Multiple choice survey was used to know the experience of participants with audiovisual graphic animated material.

Results:

We have 50% of participants that approved the standardized online performance evaluation regardless their initial level of Spanish. Our participants were from 1.86 to 2.45 scores (3.0 maximum score) even though 70% of them consider themselves beginners in their Spanish fluency. 100% of participants agree that their comfort in medical Spanish proficiency ranked higher after the completion of the course. All participants agree that topics were very relevant, and the performance evaluation test their knowledge appropriately. All participants thought that online course using audiovisual graphic animated material accomplished the same goals than in-person courses.

Conclusion

This course is an effective tool that can be utilized to build a foundation and/or increase comfort levels in communicating with Spanish speaking patients in a medical setting. It provides the framework of a model that can be adapted to the unique needs of diverse healthcare institutions and medical school during pre-clinical and clinical curriculum. Future projects aim to train healthcare providers and medical students who are native Spanish speakers to teach this course to their peers using the audiovisual graphic material created for this course because it is free and available. <https://www.youtube.com/channel/UCou6AVYEqYyv6CeqeEEnpSA> (doctormartinez channel)

Keywords: medical Spanish, Hispanic/Latino health population, medical students, medical education, physician communication

Resident/Fellow Clinical Vignette

Jocelyn McCullough, DO

2. Joseph McCullough, MD, Zucker School of Medicine South Shore University Hospital, NY

3. Clarissa Castanon, MD, Zucker School of Medicine South Shore University Hospital, NY

Zucker School of Medicine Northwell Mather Hospital

CARDIOMYOPATHY AND CHAGAS DISEASE

Introduction:

Trypanosoma cruzi is a protozoan parasite transmitted by the triatomine bug, which can cause life threatening arrhythmias and cardiomyopathy. We present a rare case of chronic chagas cardiomyopathy (CCC) in a Latin American patient.

Case Report:

A 59-year-old male immigrant from El Salvador was brought into the hospital for acute onset chest pain. Upon arrival, the patient was found to have sustained monomorphic ventricular tachycardia on cardiac monitor and was hemodynamically stable. The patient received amiodarone for arrhythmia suppression. Initial electrocardiogram (ECG) revealed a right bundle branch block with a left anterior fascicular block. Troponins were elevated to 0.26 ng/mL (0.00-0.06ng/mL). Transthoracic echocardiogram showed decreased left ventricular ejection fraction of 35% with moderately decreased global left ventricular systolic function and multiple left ventricular regional wall motion abnormalities. Cardiac catheterization showed non-obstructive coronary artery disease. Given our patient's endemic area of origin, additional testing for chaga's disease was performed which was positive with *Trypanosoma cruzi* IgG antibodies= 3.9 (negative <1). This confirmed chronic chagas cardiomyopathy (CCC) since all other causes were ruled out. Our patient received an implantable cardioverter-defibrillator (AICD) and was recommended to follow up with a heart failure specialist for close monitoring.

Discussion:

CCC usually presents 15-20 years after initial infection and 20-30% of these patients clinically present with heart failure, atrioventricular (AV) block, stroke and in worse case scenarios life threatening arrhythmias leading to sudden cardiac arrest. Our patient was in the determinate phase of CCC and had a high Rassi score of at least 13 indicating a 10-year mortality of nearly 85%. We therefore emphasize the importance of timely management with AICD in suitable patients to prevent sudden cardiac death from life threatening arrhythmias. Additionally, we recommend timely initiation of guide line mediated treatment for heart failure and close monitoring with advanced heart failure specialists for worsening signs of heart failure.

Resident/Fellow Clinical Vignette

Joseph Menand, MD

Nathani Rohit, MD

Susan Lin, DO

Mount Sinai Morningside-West

RARE CASE OF ACQUIRED FACTOR VIII DEFICIENCY: PRESENTATION AND MANAGEMENT OF A RARE BLEEDING DISORDER

Introduction: Acquired Hemophilia A (AHA) is a rare disease, with 1 to 2 cases per million. It occurs due to production of autoantibodies that inhibit Factor VIII (FVIII), a vital step of the intrinsic coagulation cascade, resulting in the potential for lethal bleeding.

Case Presentation: Here we present an interesting case of a 59-year-old woman with history of irritable bowel syndrome and recent shingles flare on her right face 3 months prior who presented to the emergency room due to new onset ecchymoses and swelling of her left arm with concern for deep vein thrombosis. Similar, but milder, symptoms in her right arm resolved earlier that week. She also complained of arthralgias in her left elbow, wrist and metacarpophalangeal joints, but denied fevers, chills or trauma.

On examination, her vital signs were within normal limits. There were several unilateral, painful, subcutaneous nodular lesions amid areas of ecchymosis on her lateral arm and medial forearm. Her joints were tender to palpation on the left upper extremity, but without effusions. The remainder of the examination was unremarkable, except for the development of similar subcutaneous nodular lesions on her left leg over the next two days.

Initial laboratory studies were remarkable for mild anemia, an elevated activated partial thromboplastin time (aPTT) and mild elevation in creatine kinase. Other coagulation studies, platelet count and a comprehensive metabolic panel were normal. A doppler ultrasound was negative for DVT and magnetic resonance imaging revealed non-specific soft tissue swelling. Her initial presentation and work-up generated a large differential including coagulopathic disorders, vasculitis, rheumatologic disorders and occult lymphoma/malignancy. In consultation with rheumatology, a broad autoimmune panel/workup was sent that was unrevealing, and a biopsy of the subcutaneous nodule was performed which showed non-descript myositis and localized hematomas. Given the elevated aPTT, clotting factor levels were sent demonstrating a severe FVIII deficiency. Mixing studies were performed without improvement in aPTT suggesting the presence of a FVIII inhibitor. A Bethesda assay revealed an inhibitor concentration of 5.6 Bethesda units.

After establishing a diagnosis of AHA, she underwent factor replacement with recombinant FVIII and immunosuppression with prednisone leading to resolution of her ecchymosis and recovery of her aPTT and FVIII levels. She proceeded to undergo further evaluation for potential triggers for AHA, however, autoimmune, rheumatologic and malignancy work-up were negative.

Discussion: This case of AHA highlights the importance of maintaining a broad and stepwise approach to a patient with a bleeding disorder, as AHA is frequently underdiagnosed and misdiagnosed. We also hope to highlight the importance of considering AHA in patients with similar symptoms to aid in early recognition and treatment, which is fundamental as delays can be associated with adverse outcomes.

Resident/Fellow Clinical Vignette

Aisha Mujahid, MD

Arooj Shah, Amandeep Swatch, Atinderpal Maan, Khalid Gafoor

Jamaica Hospital Medical Center

Chasing the Dragon

Introduction

“Chasing the dragon” a term used to describe the inhalation of vapor after heating powdered heroine. Here we will describe a unique case of heroin induced leukoencephalopathy with the typical findings of “chasing the dragon” on brain imaging.

Case Presentation

50-year-old male with a history of substance use disorder was brought to the emergency room after he was found down by his family. Family reported patient had been using more than his usual amount of heroin. Patient was initially admitted for occipital condyle fracture however during his hospital course, he was found to have worsening mental status and was admitted to ICU for acute encephalopathy and intubated for airway protection. MRI brain showed diffuse leukoencephalopathy predominantly in the subcortical white matter of the frontal, parietal and occipital lobes and white matter tracts of the brainstem and cerebellum bilaterally. The imaging was suggestive of a classical “chasing the dragon” sign seen with inhaled heroin use. Lumbar puncture was performed and all other causes of leukoencephalopathy including progressive multifocal leukoencephalopathy were ruled out. Based on history, clinical presentation and imaging findings, the patient was diagnosed with heroine induced leukoencephalopathy. His mental status remained poor and the patient was unable to be weaned off the ventilator and eventually underwent palliative extubation and expired.

Case Discussion

The term "toxic encephalopathy" is used to describe brain dysfunction caused by toxic exposure which leads to progressive damage of the white matter. Causes include environmental factors, chemotherapeutic drugs, ethanol, cocaine, MDMA and heroin. The diagnosis of heroin induced leukoencephalopathy (HLE) is clinical with supportive neuroimaging findings. Pathogenesis of the disease is poorly understood. HLE involves the cerebellum, posterior cerebrum, and posterior limbs of the internal capsule distribution is typically bilateral and symmetrical. There is a broad range of presentations but most typically patients have dysarthria and cerebellar ataxia.

Signs and symptoms vary from mild like decreased concentration, confusion, and ataxia, while moderate symptoms present with severe confusion and delirium similar to our patient. Imaging is key in aiding in the diagnosis, unlike other encephalopathies HLE affects the white matter of the brain symmetrically. Diagnosis is made with suggestive imaging, confirmed heroin use, and positive urine toxicology. The overall prognosis is poor and depends on duration and amount of heroin inhaled. There is no proven treatment however patients are often given antioxidant therapy, including coenzyme Q, vitamin C and vitamin E. Very little data is present to show effectiveness of these treatments.

Conclusion

Heroin is one of the most commonly abused drugs. It rapidly penetrates the blood brain barrier. Despite the wide use of heroin via different routes, the syndrome is rare and mostly associated with inhaling rather than injecting or snorting practices.

Resident/Fellow Clinical Vignette

Aqsa Mumtaz

Aishwarya Prasad, Sajid Mir

Montefiore St. Luke's Cornwall Hospital

Thrombus in Transit, A Therapeutic Dilemma

Introduction:

Thrombus in transit (TIT) used to be a rare sighting but with recent technological advancements, we can now catch the thrombus as it enters the pulmonary circuit. Thrombus in the right heart can be found in about 4% of pulmonary embolism patients and can lead to paradoxical embolization in a subset of patients. We present a case of a female who presented with mild symptoms of nausea and vomiting and quickly deteriorated hemodynamically. The case report focuses on an exceptionally rare finding of capturing a thrombus in real-time as it transcends through the right atrium into the right ventricle.

Case Report:

A 74-year-old morbidly obese female presented to our Emergency Department (ED) with an acute onset of nausea, vomiting, and mild shortness of breath. She had no significant past medical history of heart failure, hypercoagulability, immobilization, or recent travel. The patient was afebrile, with a blood pressure of 154/67 mm Hg, tachycardic to 168 beats/min, tachypneic to 20s breaths/min, and maintaining saturation on supplemental oxygen.

On physical examination, she had no pertinent findings except for dry mucous membranes and abdominal distension. Her electrocardiogram was significant for rapid atrial fibrillation (AF) with a rapid ventricular rate and the chest x-ray was insignificant for any acute processes.

The patient remained hemodynamically stable and was started on relevant medications for AF. She reported feeling better and was slowly being weaned off of the supplemental oxygen, soon after which she became hypotensive and was started on vasopressors. An emergent bedside echocardiogram showed evidence of a massive right ventricular enlargement with a large TIT in the right atrium. Due to the huge clot burden, right ventricular strain, and TIT, mechanical thrombectomy was planned but the patient continued to deteriorate. A multi-disciplinary meeting was called and systemic fibrinolysis was performed with t-PA, and anticoagulation with IV heparin was subsequently maintained. She was then transferred to TCC for mechanical thrombectomy.

Discussion:

A TIT is defined as a right heart thrombus that is not attached to any intra-cardiac structures.

TIT is seldom reported and is often associated with PE and paradoxical systemic thromboembolism. The volatile nature of thrombus in transit and its potential for triggering hemodynamic instability makes it a therapeutic dilemma. Multiple studies have shown the efficacy of anticoagulation, thrombolysis, and surgical interventions but thrombolysis has proven to be superior in recent studies. In our patient, a mechanical thrombectomy was initially planned but her sudden clinical deterioration prompted us to treat her with t-PA and heparin. Hence we recommend a multidisciplinary approach for the management of TIT. A high level of suspicion, early detection, and appropriate management can not only help us make informed decisions but also reduce the mortality associated with TIT.

Resident/Fellow Clinical Vignette

Shyama Nair

Albina Guri, DO and Saleem Shahzad, MD

New York Presbyterian Brooklyn Methodist Hospital

Development of Interstitial Lung Disease and Fibrotic Changes Post Covid-19, a Look at Long Term Sequelae.

We report a case of Covid pneumonia with rapid progression to interstitial lung disease (ILD) with severe fibrosis. To our knowledge, there are only a few reported cases of Covid-19 causing rapid development of ILD and progression to fibrosis. While it is known that a large number of patients who develop acute respiratory distress syndrome (ARDS) develop long term sequelae with deterioration of pulmonary function and progression to fibrosis, there is limited data from studies depicting such consequences post coronavirus infections.

A 64-year-old female with a medical history of multiple myeloma (MM) presented to the emergency department (ED) with shortness of breath for one week. The patient had been on chemotherapy for MM with Revlimid, Velcade and dexamethasone for the past year. A month prior to this, she had been admitted for Covid, treated with remdesivir/dexamethasone and discharged without supplemental oxygen. In the ED, she was found to be hypoxic with chest x-ray showing patchy/reticular opacities, suspicious for pneumonia. She was admitted for acute hypoxic respiratory failure and started on broad spectrum antimicrobials but had rapid respiratory decompensation and required an upgrade to the Intensive Care Unit for mechanical ventilation. Computed tomography (CT) chest showed bilateral ground-glass opacities, air bronchograms, and reticulations. Bronchoalveolar lavage had neutrophilic predominance but was negative for bacteria, fungi, or acid-fast bacilli. She progressed into severe ARDS and remained profoundly hypoxemic despite lung protective ventilation strategies and was evaluated for extracorporeal membrane oxygenation but deemed to be a poor candidate. She was challenged with pulse dose steroids with minimal improvement to allow for tracheostomy placement. Steroids were tapered and a CT chest at 2 months showed increased fibrotic changes, traction bronchiectasis, and architectural distortion. After 3 months, the patient remains hospitalized and on full ventilator support.

The etiology of her lung injury is hypothesized to be accelerated fibrosis post-COVID. Approximately 10-30% of patients with COVID develop a syndrome that can have systemic consequences. A meta-analysis showed changes defined as inflammatory (ground-glass opacification, consolidation) or fibrotic (reticulation, architectural distortion, traction bronchiectasis, honeycombing) in a subpopulation of patients with severe COVID infection 12 months after discharge. Longitudinal follow up studies are required to understand the permanence of these changes and investigate the role of anti-fibrotic agents. Early recognition of risk factors for developing post-COVID fibrosis will not only allow for better understanding of the pathological mechanisms but enable the implementation of surveillance programs and treatment options that may prevent patients from developing irreversible lung damage.

Resident/Fellow Clinical Vignette

Hiba Narvel, MD

Anahat Kaur, Jiyoung Seo, Abhishek Kumar .

Jacobi Medical Center and Albert Einstein College Of Medicine

A diagnostic dilemma : When differentiating Multisystem Inflammatory Syndrome in Adults and Hemophagocytic Lymphohistiocytosis becomes challenging

INTRODUCTION

Hyperinflammatory syndrome with breakthrough coronavirus disease 2019 (COVID-19) infection in a fully vaccinated adult patient is not a common finding. To the best of our knowledge, this is the first such case of a patient who received the Spikevax/Moderna (elasomeran mRNA-1273) vaccine.

CASE DESCRIPTION

A 63-year-old female presented with fatigue, dry cough, diarrhea, and shortness of breath for a week and new-onset atrial fibrillation. Her vitals and physical examination were within normal limits.

Although the patient was fully vaccinated against COVID-19, she was found to have positive SARS-CoV-2 polymerase chain reaction (PCR). With significantly elevated titers of COVID-19 spike antibody (>2,500 U/ml) showing an appropriate response to vaccination.

Echocardiogram showed newly decreased ejection fraction (40%) and left ventricular hypokinesis. Labs significant for troponinemia (2.270 µg/L), elevated pro-B-type natriuretic peptide (pro-BNP) (>70,000 pg/mL), C-reactive protein (183.5 mg/dL), ferritin (17,899 µg/L), elevated aspartate transaminase (681 U/L), alanine aminotransferase (>700 U/L), D-dimer (2,573 ng/mL), and procalcitonin (5.32 ng/mL). Extensive infectious work up including blood cultures was negative.

Initial complete blood count showed hypochromic, microcytic anemia (hemoglobin: 9.6 g/dL) and leucocytosis (41.66 white blood cells/nL) with 86.8% lymphocytes (36.15 lymphocytes/nL). Abdomen ultrasound depicted splenomegaly (spleen size 14.1 cm). CT pulmonary angiography revealed multiple bulky bilateral axillary, hilar, and mediastinal lymph nodes

Peripheral blood smear and flow cytometry concerning for chronic lymphocytic leukemia. Several left-shifted leukocytes with toxic granules concerning for acute infectious processes.

Elevated soluble interleukin-2 receptor level and elevated chemokine ligand 9 (CXCL9) level were present. Elevated CXCL9 is nonspecific to distinguish between HLH and MIS. Triglyceride (166 mg/dL) and fibrinogen (446 mg/dL) levels were within normal limits. The patient was started on steroids and improved rapidly.

DISCUSSION

MIS-A is difficult to distinguish from HLH or severe COVID-19 infection due to significant overlap in clinical presentation and laboratory diagnostic findings; hence, requiring a low threshold of suspicion and detailed workup to evaluate all diagnostic possibilities

It has been found that 60% of adult patients with MIS-A had overlapping acute COVID-19 symptoms.

Our patient met the case definition of MIS-A according to the CDC criteria and fit criteria for level 1 of diagnostic certainty (definitive case) based on Brighton Collaboration Case Definition. Like the other cases of MIS-A post-

Resident/Fellow Clinical Vignette

vaccination that were reported by Salzman et al. and Nune et al., our patient responded well to steroids. She met only three out of nine criteria needed for HLH diagnosis. Absence of cytopenias also went against HLH since these are generally seen in 80% of the patients.

Preliminary MIS-A case definitions and testing algorithms need to be refined further as currently, these include many features, which are commonly seen in most inflammatory conditions leading to a paucity of clear diagnostic guidelines

Resident/Fellow Clinical Vignette

Irfan Nathani, MD

Kelly O'Boyle, MD; Saif Amin; Salman Haq, MD; Bharath M. Reddy, MD

New-York Presbyterian Brooklyn Methodist Hospital

Intractable Hiccups: A case to twiddle your thumbs over

Twiddler's syndrome is a rare complication that can occur after automatic implantable cardioverter-defibrillator (AICD) implantation. It is caused by conscious or unconscious manipulation at the implantation site by the patient resulting in device malfunction.

An 89 year old woman presented to her cardiologist's office with complaints of occasional dyspnea, hiccups, uncomfortable muscle twitching on the right side of her chest, and generalized malaise. Her main symptom of concern was persistent hiccups that had been present for six weeks. Hiccups were not improved with over the counter medications or home remedies. Her medical conditions included hypertension, hyperlipidemia, dementia, coronary artery disease, and chronic systolic heart failure with biventricular AICD placement in 2020. Her presenting symptoms prompted device interrogation which showed inability to obtain sensing or capture threshold of the right atrial lead, raising the possibility of atrial lead dislodgement. Patient was referred to the ED where chest x-ray showed apparent retraction of the right atrial lead of the left chest wall AICD, overlying the SVC confluence, thus confirming lead displacement. While the patient did not give a clear history of manipulation of the AICD, there was clinical suspicion that this was the etiology of the displaced lead. The patient underwent successful lead revision and subpectoral placement of her pulse generator (to make it less accessible) with resolution of her symptoms.

Twiddler's syndrome refers to repeated manipulation or "twiddling" of an implanted device within its skin pocket by the patient, which can result in coiling of the leads and dislodgement, leading to device malfunction. Presentation of Twiddler's syndrome can vary depending on the degree of displacement and final site of the dislodged lead. The displaced lead may cause phrenic nerve stimulation, prompting diaphragmatic contractions and spasms of involuntary hiccups. Chest x-ray is a simple and readily accessible tool that can assist in establishing a diagnosis. The treatment involves repositioning of the dislodged lead along with suture fixation of the lead and implanted device within its pocket. Elderly patients are at higher risk because the loose subcutaneous tissues can allow the device to rotate in its pocket. Appropriate patient education and counseling against manipulation of the device are the key strategies to prevent Twiddler's syndrome.

Resident/Fellow Clinical Vignette

Chengu Niu, MD

Hemanth Krishna Boppana

Jay Amol Bapaye

Ahmed Shehadah

Rutwik Pradeep Sharma

Kaiwen Zhu

Hongli Liu

Nagesh Jadhav

rochester general hospital

A Rare Case of Sarcoidosis with Multiorgan Involvement Presenting as Acute Pancreatitis

Introduction: Sarcoidosis is a systemic granulomatous disease mainly involving the lungs and hilar lymph nodes. Gastrointestinal manifestations are not uncommon, but acute pancreatitis rarely occurs. We describe an interesting case of sarcoidosis with pulmonary, liver, spleen, kidney, eye, and bone marrow involvement presenting as acute pancreatitis.

Case: A 40-year-old African American male presented with acute abdominal pain associated with nausea and vomiting. He described progressive fatigue before admission and had lost 50 pounds over the last year. Physical examination revealed diffuse abdominal tenderness and abdominal distention. Blood work showed pancytopenia, elevated lipase (1594 U/L), hypercalcemia (13.7 mg/dl), and elevated creatinine (4.3 mg/dl). Computed tomography (CT) scan of the abdomen and pelvis demonstrates acute pancreatitis and Hepatosplenomegaly with numerous enlarged abdominopelvic lymph nodes. CT chest showed bilateral mediastinal, hilar, and bilateral axillary lymph node enlargement. His liver biopsy revealed non-necrotizing granuloma with a diagnosis of sarcoidosis. Acid-fast bacilli (AFB) stain, culture, and Grocott methenamine silver stain (GMS) were negative for infection. He was diagnosed with Hypercalcemic pancreatitis secondary to sarcoidosis and admitted to the medical intensive care unit. The patient was treated with intravenous fluids, subcutaneous Calcitonin, and prednisone. About 72 hours after hospital admission, he was discharged home with significantly improved abdominal symptoms.

Discussion: Hypercalcemic pancreatitis is a rare manifestation of Sarcoidosis. The mechanism for developing hypercalcemia in sarcoidosis is increased intestinal calcium absorption induced by high serum calcitriol concentration. It is vital to consider sarcoidosis in the differential of a patient who presents with hypercalcemic pancreatitis because it often responds well to steroid therapy. A previous study revealed that patients with sarcoidosis and acute pancreatitis have an increased chance of multiorgan failure compared to patients without sarcoidosis. Therefore, closer monitoring in intensive care units could be considered while caring for these patients.

Conclusion: This case adds to the literature on acute pancreatitis as the rare manifestation of sarcoidosis. Sarcoidosis should be included in the differential for hypercalcemic pancreatitis.

Resident/Fellow Clinical Vignette

Chengu Niu, MD

Hemanth Krishna Boppana

Jay Amol Bapaye

Ahmed Shehadah

Rutwik Pradeep Sharma

Kaiwen Zhu

Hongli Liu

Nagesh Jadhav

rochester general hospital

A Giant Hiatal Hernia Masquerading as Septic Shock

Introduction: Hiatal hernia refers to a component of the abdominal cavity, most commonly the stomach, prolapse through the esophageal hiatus of the diaphragm into the mediastinum. Giant hiatal hernias are generally defined as protruding more than 50% of the stomach above the diaphragm. We describe an interesting case of a giant hiatal hernia causing persistent hypotension and respiratory distress.

Case: A 43-year-old female patient came from a nursing home with cerebral palsy, quadriplegia, and neurologic bladder with a chronic foley catheter and chronic bilateral hydronephrosis and presented to the emergency room for diarrhea, nausea, and dry heaving. She was noted to be tachycardic, hypotensive, tachypneic, and with abdominal distension. Subsequently, she went into respiratory distress and underwent endotracheal intubation. Initially, she was treated for septic shock with intravenous fluid, broad-spectrum antibiotics, and vasopressors. Computed tomography angiography (CTA) showed a massive right-sided diaphragmatic hernia with severe compression of the heart, inferior vena cava, and superior mesenteric vein. The stomach was severely dilated, with the intraperitoneal portion measuring up to 8 x 13 cm and the intrathoracic portion measuring up to 12 x 20 x 17cm. After discussing with the family, the patient underwent thoracoabdominal exploration. During surgery, an incarcerated, strangulated hiatal hernia was discovered, with hernia contents passing through the diaphragmatic hiatus and extending posteriorly to the inferior vena cava into the right chest, with evidence of necrotic proximal stomach, necrotic colon, and necrotic small bowel within the hernia sac. Unfortunately, the patient had a cardiac arrest and died during surgery.

Discussion: Giant hiatal hernias may cause many complications, such as gastric volvulus, bleeding, obstruction, strangulation, perforation, and respiratory compromise. Decompensated intestinal ischemia caused by the compression of a giant hiatal hernia can mimic septic shock. With the progress of intestinal ischemia, transmural intestinal infarction may develop. In our case, CTA showed the heart was severely compressed by the giant hiatal hernia, which may increase pulmonary artery pressure and decrease cardiac output leading to respiratory distress. Early recognition and intervention should be conducted to avoid severe outcomes.

Conclusion: Giant hiatal hernias can cause intestinal ischemia masquerading as septic shock. This case aims to highlight the heterogeneity in presentations of giant hiatal hernias.

Resident/Fellow Clinical Vignette

Esmirna Perez, MD

a-Nehemias Guevara, MD, a-Maria Perez, MD a-Paula Perdomo, MD, b- Ricardo Velasquez, MD.

a: SBH Health System, Bronx, NY, Department of Medicine

b: SBH Health System, Bronx, NY,, Division of Pulmonary, Critical Care and Sleep Medicine, Department of Medicine,

SBH Health System

When the brain bleeds. An unusual suspect?

Intracranial hemorrhage can have different presentations with Subarachnoid hemorrhage (SAH) being one of them. SAH is one of the deadly forms of headache and its etiology can be traumatic (SAH-T) or non-traumatic (SAH-NT). Non-traumatic SAH is most commonly associated with aneurysmal origin but non-aneurysmal causes can also represent significant morbidity and mortality.

We present a case of a 65-year-old male with a past medical history of hypertension, hyperlipidemia, diabetes mellitus, chronic kidney disease, coronary artery disease, heart failure with preserved ejection fraction, Valvular heart disease, and asthma admitted for an unusual cause of NT-SAH. He complained of worsening headache, nausea and vomiting, dizziness, and right ear, neck, and right arm pain with numbness. The symptoms started three weeks before admission, after falling down the stairs. In the ED, he was found with elevated Blood pressure and neck stiffness with negative Kernig's sign. Furthermore, he had right-sided anterior deltoid numbness, right hemiparesis, horizontal nystagmus (right>left (R>L)), difficulty with convergence, decreased hearing on the right, right-sided hypoesthesia (Cranial nerves V1-V3), right peripheral facial palsy, asymmetric soft palate elevation, Hyperreflexia dysdiadochokinesia and dysmetria (R>L). The patient was started on nicardipine infusion for blood pressure control.

CT brain showed subarachnoid hemorrhage in the right cerebellopontine angle. An MRI of the brain demonstrated a calcified right cerebellopontine angle (CPA) mass extending into the right internal auditory canal and causing right brain stem compression. Computed tomography angiography of head and neck demonstrated no aneurysms with intact vasculature.

The patient underwent right retrosigmoid craniotomy and resection of cerebellopontine angle tumor without complications. The surgical pathology demonstrated a schwannoma, central nervous system world health organization grade I. During his admission, the patient had multiple complications, but he was discharged to a rehabilitation facility with almost complete recovery.

SAH-NT occurs as a consequence of Aneurysmal rupture in 85% of cases and its occurrence secondary to tumors is an extremely rare pathology. Less than 20 cases have been reported, in which schwannomas are responsible for SAH. Schwannomas arise from perineural elements of the Schwann cells, CPA can be subclassified acoustic or non-acoustic, in our case the patient had a CPA non-acoustic with compression of the surrounding nerves, manifesting as nerve palsies. CPA furthermore, is a highly vascular area, the reason why SHA is a possibility that should be considered.

It is important for every clinician to keep this rare etiology in mind as the treatment of SAH is based on identifying the cause. In the case of schwannomas, surgery is indicated once diagnosed because of the possibility of rebleeding which tends to be catastrophic.

Resident/Fellow Clinical Vignette

Esmirna Perez, MD

2-aNehemias Guevara, MD, 3-aJordan Smith, MD, bRicardo Velasquez, MD.

1a: SBH Health System, Bronx, NY. Department of Medicine.

b: SBH Health System, Bronx, NY Division of Pulmonary, Critical Care and Sleep Medicine, Department of Medicine.

SBH Health System

Altered Mental status. Is the cause always clear? (when the brain gets attacked on multiple fronts)

Altered mental status (AMS) is a common condition encountered in daily practice. Finding the cause is essential for treatment but sometimes this may be challenging. We present a case of a 44-year-old female with a past medical history of antiphospholipid syndrome not on anticoagulation, peptic ulcer disease, chronic kidney disease, stroke, seizures, congestive heart failure with reduced ejection fraction (EF 40%), two Non-ST-segment elevation myocardial infarctions not on dual antiplatelet therapy due to history of gastrointestinal bleeding, admitted to the hospital with AMS.

She presented to the emergency-department with complaints of one day of constant abdominal pain associated with shortness of breath. On admission, had an elevated blood pressure, was tachypneic and AMS with a Glasgow coma scale of 8. Capillary blood glucose level was 22 mg/dl. After treatment, there was no improvement in mental status. Patient was intubated for airway protection. Diagnostic tests were remarkable for elevated creatinine, transaminitis, hyperbilirubinemia, anemia, and thrombocytopenia. EKG showed new ST-segment elevation in leads II and III accompanied by elevated troponin level. Cardiac catheterization was done, showed subtotal occlusion of the apical left anterior descending artery, secondary to spontaneous coronary artery dissection (SCAD). Patient was started on heparin infusion and was weaned off sedation without improvement of mental status. CT head discarded acute intracranial pathology. Platelets trended further down on the second day of admission; heparin infusion was stopped. Lactate dehydrogenase trended up with progressively worsening anemia and renal function. Concomitant microangiopathic hemolytic anemia (MAHA) was considered. The peripheral blood smear showed schistocytes, and the patient was treated with plasmapheresis for suspected thrombotic thrombocytopenic purpura (TTP). Diagnosis was confirmed afterwards with decreased activity of ADAMTS13 (Disintegrin and metalloproteinase with a thrombospondin type 1 motif, member 13) and an elevated ADAMTS13 antibody. After plasmapheresis the patient improved and was successfully extubated.

SCAD is frequently underdiagnosed and is a potentially fatal cause of acute coronary syndrome. Clinical presentation depends on the extent of SCAD, ranging from unstable angina to sudden death. AMS has not been reported with this condition, but it may be possible in states of hypoperfusion.

TTP is part of the MAHA spectrum, presenting with AMS as the cardinal symptom. TTP is a clinical emergency, a high index of suspicion should be present as the mortality rate in untreated patients is as high as 90% and can be reduced to 10-20% with proper treatment.

Our patient represented a challenging diagnosis of AMS, had two life-threatening pathologies with opposite management and overlapping features, TTP may have been caused by SCAD even though that has never been reported. It is important to recognize frequently a single diagnosis can explain a patient's clinical manifestations, but sometimes various conditions might be present concomitantly.

Resident/Fellow Clinical Vignette

Farah Sahibzada, DO

Farah Sahibzada, D.O.

Nadia Abdulwahab, M.D.

Garnet Health Medical Center

UNUSUAL CASE OF SEVERE RHABDOMYOLYSIS AND TOXIC BRAIN LESIONS IN A HEALTHY PATIENT INFECTED WITH LISTERIA MONOCYTOGENES MENINGITIS

Introduction: *Listeria Monocytogenes meningitis* (LM) is a foodborne bacterial illness that can cause serious complications in people with weakened immune systems, pregnant women, newborns, and adults older than 65. Rarely is LM found in immunocompetent, non-pregnant adults, and very rarely causes complications of extremely elevated creatine kinase (CK) levels along with toxic brain lesions.

Case Presentation: A previously healthy 28 year-old female presented to the emergency department with a 3-day history of throbbing frontal headache, with associated subjective fever, nausea, vomiting, neck pain, visual disturbances, and altered mental status, with no diarrhea or arthralgias. History of presenting illness was significant for recent travels from Nicaragua to Texas via boat two months prior and then traveled via plane to New York. The patient endorsed eating a lot of soft cheeses, which was revealed later during the admission. On physical exam, the patient initially appeared in acute distress with an altered level of consciousness, however she was able to follow simple commands. The patient was also unable to perform right eye lateral gaze and had neck stiffness. Physical exam was unrevealing for any other focal neurological deficits, rashes, cardiovascular abnormalities. Given suspicion for meningitis, a lumbar puncture was performed, which was diagnostic of *Listeria Monocytogenes*. Laboratory findings were significant for elevated CK levels, peaking at 10,020 U/L. Non-contrast computed tomography (CT) of the head showed no acute pathology, however magnetic resonance imaging (MRI) of the brain showed subtle toxic lesions involving the posterior splenium of the corpus callosum. These findings concerning for infectious versus epileptogenic processes prompted evaluation with video electroencephalogram (VEEG), which was unrevealing for any epileptogenic features. Transesophageal echocardiogram was negative for evidence of infective endocarditis. Transaminitis was also present, with levels of aspartate transaminase (AST) and alanine transaminase (ALT) peaking at 258 U/L and 239 U/L, respectively. Inflammatory markers were elevated with sedimentation rate of 94 mm/hr and c-reactive protein of 7.9 mg/dL on admission. The patient was treated with a three week course of intravenous ampicillin and two week course of intravenous gentamicin. Gentamicin levels were monitored and intravenous fluids were administered for hydration. Over the course of her hospital admission, the patient had improvement in her mental status with resolution of headache and ocular symptoms. Although CK levels remained elevated for some time, levels decreased to 475 U/L prior to discharge and transaminitis resolved.

Conclusion: This case illustrates the rare relationship between *Listeria Monocytogenes meningitis* and toxic lesions of the corpus callosum in addition to severe non traumatic rhabdomyolysis.

Resident/Fellow Clinical Vignette

Saurabhi Samant, MD

Kristin Swedish, MD

Montefiore Medical Center- Wakefield Campus

Intractable Abdominal Pain: A Thromboembolic Phenomenon

Clinical Case

A 58-year-old man presented with right lower quadrant abdominal pain for one day. A dull aching, non-radiating pain initially began around the umbilicus and then moved to the right lower quadrant. He also felt nauseated and had multiple episodes of non-bilious, non-bloody emesis. The abdomen was soft, not distended, and tender to palpation in the right lower quadrant with rebound tenderness and no rigidity.

Emergent non-contrast computed tomography (CT) abdomen and pelvis revealed no signs of acute appendicitis, bowel obstruction, or nephrolithiasis. Blood chemistry reflected acute kidney injury with elevated creatinine of 1.6 mg/dL, glucose 400 mg/dL, and hemoglobin A1c of 9.9%. He continued to have severe abdominal pain of unclear etiology, scarcely controlled with medication. On day 3 of admission, CT abdomen-pelvis with contrast revealed right renal artery stenosis with near total infarction of right kidney. It also offered a partial view of thoracic aorta, which revealed thrombus in the aortic arch. A dedicated chest CT angiography revealed 1.3 cm diameter thrombus in proximal descending thoracic aorta with no dissection. The patient was started on a heparin drip. He did not have any personal or family history of bleeding or hypercoagulable disorders. The complete advanced coagulation panel (antithrombin 3, factor V Leiden gene, lupus anticoagulant, antiphospholipid antibodies and proteins C, S) was negative. Vascular surgery deferred surgical intervention due to its high risk related to placement of thrombus in the aortic arch; risks of embolization during surgery were felt to be equal to that of medical management alone. The patient was discharged on anticoagulation.

Discussion

Abdominal pain is one of the most common presenting symptoms and can often be non-specific, representing various underlying pathologies. Non-contrast CT scan is usually the preferred emergent imaging modality. However, early diagnosis of rare etiologies, such as renal infarcts in our case, can be missed, especially in patients with no known risk factors and in patients with atypical presentation, such as the absence of flank pain or hematuria in our case.

Our case highlights the need for timely identification of renal infarcts as the likelihood of benefit from revascularization depends largely on the duration from the time of symptom onset, along with other factors (e.g., type of vessel, degree of stenosis, degree of functional impairment). Spontaneous renal artery infarcts are commonly caused by a thromboembolic source originating from the heart or aorta. In many cases, aortic thrombus can uncover an underlying dissection; hence, a CT angiogram of the chest was done to rule out the possibility of dissection before anticoagulating the patient.

In general, even though rare, renal infarcts can present with non-specific abdominal pain and require high level of suspicion; contrast-enhanced CT early on can improve the clinical trajectory significantly.

Resident/Fellow Clinical Vignette

Thanmay Sathi

Komgrit Chukiert MD, Eric Knight MD, Anush Patel MD, Day Hills MD, Richard Loftus MD. Bassett Health Network and Bassett Internal Medicine Residency, Cooperstown NY.

Bassett Medical Center

Sometimes, Occam's Right: Membranous Nephropathy as a Paraneoplastic Syndrome of Small Cell Lung Cancer

Introduction

Nephrotic syndrome uncommonly presents as a paraneoplastic syndrome of membranous nephropathy from small cell lung cancer.

Case description

A 58-year-old man presented to the ED with elevated home blood pressure readings and leg swelling over the past few weeks. Leg swelling, initially intermittent and unilateral, progressed to severe bilateral 3+ pitting edema to mid-thigh. He had no known past medical history but was a chronic smoker (1.5 packs/day) with 12 alcoholic drinks/week. Urinalysis showed protein of 300 mg/dl; serum albumin was 2.2 g/dl. After furosemide treatment, he was discharged with advice to establish with primary care. SPEP results later showed polyclonal IgM without monoclonal proteins [Table 1].

After 20 days, he re-presented to the ED with chest pain. CT angiography showed a non-obstructive LAD plaque—but also a focal opacity in the left upper lung lobe, with mediastinal lymphadenopathy [Fig 1]. Meanwhile, creatinine climbed; nephrology consult led to finding a urine microalbumin of 1,547 mg/dl. A diagnosis of nephrotic syndrome, secondary to presumed lung cancer, was made. Extensive serologic evaluation was done [Table 2]. EBUS with trans-bronchial biopsy revealed small cell carcinoma [Fig 2].

Treatment with carboplatin and etoposide chemotherapy with concurrent radiation for 2 months yielded a good response complicated by anemia requiring transfusions. The nephrotic syndrome was initially managed with high-dose furosemide, compression stockings, and low-salt diet. Only after chemotherapy response, however, did the nephrotic syndrome improve [Table 2]. The patient is doing well and continues monitoring with oncology and nephrology consultants.

Discussion

Nephrotic syndrome presents with proteinuria (urinary protein excretion >3.5 g/day), hypoalbuminemia, edema, and hyperlipidemia. Membranous nephropathy (MN) is the most common cause of nephrotic syndrome in adults (24% of cases). Its classic pathological finding includes diffuse thickening of the glomerular basement membrane with absence of significant hypercellularity [Fig 3]. Primary MN accounts for nearly 75% of the cases. Remaining secondary MN causes include SLE; drug toxicity; hepatitis B, hepatitis C and syphilis; light chain protein deposits; and malignancy.

In one study, 10% of patients with MN were secondary to neoplasia. The most common cancers leading to nephrotic syndrome are lung, prostate and gastrointestinal cancer; renal biopsy findings are distinctive [Fig 2]. As patients with malignancy can present with nephrotic symptoms first, screening for cancer may be considered in patients above age 65 or with great than 20 pack-years of smoking. Paraneoplastic MN has been documented with all types of lung cancers, including small cell carcinoma, non-small cell carcinoma, and large cell adenocarcinoma.

Resident/Fellow Clinical Vignette

Rossana Seno, MD

Hector I. Ojeda-Martinez, MD

Nuvance Health

Aerococcus urinae: an emerging cause of bacteremia and infective endocarditis

Background:

Aerococcus urinae is an emerging uropathogen that has also been recognized, albeit rarely, to cause bacteremia and endocarditis. It is a gram positive, microaerophilic, alpha-hemolytic, catalase-negative bacteria which, prior to the use of matrix-assisted laser desorption ionization time-of-flight mass spectrometry (MALDI-TOF MS), is often misidentified as staphylococcus due to its gram stain morphology as cocci in clusters or as streptococcus in view of its alpha hemolysis in blood agar. It is resistant to some of the commonly used classes of antibiotics such as sulfonamides and fluoroquinolones. Up until recently, most treatment approach is based on anecdotal reports.

Case:

An 85-year-old male with Parkinson's disease was brought to the emergency department (ED) for worsening mentation. He was recently admitted to a nursing home for respite care. Two days prior, he was well and conversant. There was no recent urinary tract instrumentation. At ED, he was lethargic, afebrile but hypotensive, tachycardic, tachypneic and hypoxic. Bibasilar crackles and 3/6 diastolic murmur were heard on auscultation. There was no jugular venous distention, bipedal edema or focal neurologic deficits. Immediate fluid resuscitation and empiric antibiotics – cefepime and azithromycin, were started. Chest x-ray showed bilateral patchy perihilar consolidation while head CT was negative. Laboratory results were significant for leukocytosis with neutrophilic predominance, normocytic anemia, elevated creatinine and BUN, lactic acidosis, elevated procalcitonin as well as troponin. EKG showed sinus tachycardia without acute ischemic changes. Urinalysis was negative. He was temporarily stabilized after the initial resuscitation but later decompensated requiring emergent intubation and admission to ICU for acute hypoxic respiratory failure and septic shock secondary to pneumonia. On the first hospital day, blood cultures came back positive for gram positive cocci in clusters. Expecting staphylococcus, IV vancomycin was started and cefepime was deescalated to ceftriaxone. Transthoracic echocardiogram showed severe aortic regurgitation and aortic valve vegetation. Cardiothoracic surgery was consulted but the patient's wife opted for conservative management. Eventually, the pathogen was identified as *Aerococcus urinae*. The aforementioned antibiotics were continued pending sensitivity result. Subsequent cultures came back negative but he continued to be hemodynamically dependent to vasopressors and remained stuporous off sedation. Complicating his course was the worsening renal injury, metabolic acidosis, ischemic hepatitis and thrombocytopenia. The family declined renal replacement therapy and transitioned care to comfort measures on the sixth hospital day. The patient expired an hour after pressors were discontinued.

Conclusion:

This case highlights how *Aerococcus urinae* is often misidentified by relying solely on its morphology. The incidence and correct identification of *Aerococcus urinae* infection will likely increase with the use of MALDI-TOF MS. Given this, awareness about this pathogen is therefore important to enable clinicians to correctly approach its treatment and management.

Resident/Fellow Clinical Vignette

Rajendra Shah, MBBS

Rajendra Shah

Ali Al Safi

James Lyons

Nuvance Health

Androgenic anabolic steroid abuse causing cardiomyopathy

Introduction: Androgenic anabolic steroids (AAS) are synthetic derivatives of testosterone and their analogs, such as testosterone enanthate, nandrolone, and androstenediones. Androgenic anabolic steroid abuse has been linked to various cardiac effects, including dilated cardiomyopathy, myocardial infarction, sudden cardiac death, and arrhythmias such as atrial fibrillation.

Case presentation: A 50-year-old male with a past medical history of hyperlipidemia, obesity, asthma, and hypogonadism on weekly testosterone injections and anastrozole presented with the complaint of progressive shortness of breath over one month. A week before this presentation, the patient attributed his symptoms to an asthma exacerbation and went to the ED, where he received albuterol and was discharged on a course of prednisone with minimal improvement. However, his symptoms worsened, and he was brought to the hospital again. Physical exam and vitals were normal except for tachycardia and trace bilateral edema. Initial labs were significant for polycythemia (17.9g/dL), acute kidney injury (creatinine 1.29 mg/dl), mildly elevated liver enzymes, elevated BNP (561 pg/mL), and negative troponin. EKG was negative for ischemic ST-T changes. Chest x-ray revealed cardiomegaly. Further blood work showed elevated total testosterone level (> 1500 ng/dL) and free testosterone level (> 432 pg/mL). An echocardiogram showed severely decreased EF at 20%, severe global hypokinesis, mild left ventricular dilatation and right ventricular dilatation, and moderately reduced right ventricular global systolic function. Cardiac catheterization did not show any significant coronary blockage. The patient was started on guideline-directed medical therapy with significant improvement in his symptoms. The patient was discharged, and an outpatient cardiac MRI showed severely dilated left and right ventricle suggestive of dilated cardiomyopathy. The patient had a repeat echo seven months after the initial echo and showed a nondilated left ventricle with mildly reduced systolic function, EF 45%, normal right ventricular size, and systolic function.

Discussion: This case was significant for presenting anabolic steroid abuse with polycythemia in a patient who developed nonischemic cardiomyopathy. Androgenic anabolic steroid abuse can cause cardiomyopathy in multiple ways- direct toxic to myocardium due to increased production of reactive oxidative species, activating apoptotic pathways, and increasing the activation of the renin-angiotensin-aldosterone system, fibrosis mediated by aldosterone-like and growth-promoting effects on the cardiac muscle. The endocrine Society clinical practice guidelines recommend a dose of 75-100 mg/week of testosterone in male hypogonadism, but this patient was taking 200 mg/week. Androgenic anabolic steroid-induced cardiomyopathy is usually seen in young males and is reversible with cessation of androgenic anabolic steroid, which is seen in this patient.

Conclusion: Androgenic anabolic steroid abuse is one of the reversible causes of nonischemic cardiomyopathy. It is important to monitor androgenic anabolic steroid abuse in primary care.

Resident/Fellow Clinical Vignette

Joshua Shapiro, MD

Joanna Eichler, Omair Khan MD, Gurchetan Randhawa MD, Ravi Patel MD, Mark Sonnenschine MD, Chanaka Seneviratne MD, Carl Schiff MD

Maimonides Medical Center

An Unusual Case of Etanercept Causing Neurosarcoidosis

Introduction:

Neurosarcoidosis is an uncommon presentation of weakness and difficulty walking. Moreso, neurosarcoidosis caused by the tumor necrosis factor-alpha inhibitor, etanercept is exceptionally infrequent. The following case illustrates the development of neurosarcoidosis in a middle-aged woman whose rheumatoid arthritis was well-controlled for many years on a combination of etanercept and methotrexate.

Case presentation:

A 58-year-old woman with a past medical history of rheumatoid arthritis and hypothyroidism (Hashimoto's thyroiditis) presented to the hospital with fatigue, two weeks of progressive weakness of her arms and legs associated with numbness, subsequently leading to an impaired gait and two falls. In the months leading up to admission, the patient suffered from middle-back pain for which she sought evaluation, including magnetic resonance imaging (MRI) of the thoracic spine that did not show any spinal cord pathology but incidentally identified bilateral mediastinal and hilar lymphadenopathy.

During hospitalization, labs were notable for an elevated erythrocyte sedimentation rate of 69 MM/HR, and an elevated c-reactive protein of 5.3 mg/dL. Computed tomography chest with contrast confirmed the lymphadenopathy previously seen on the MRI and further suggested an esophageal origin. An esophagogastroduodenoscopy (EGD) was thus prompted but only to reveal candidal esophagitis.

MRI brain displayed cystic lesions of the choroid plexus bilaterally, likely xanthogranulomas. MRI of the spine with contrast was significant for leptomeningeal enhancement in the distal thoracic cord and enhancement of the S2 nerve root in the cauda equina. Electromyogram and nerve conduction studies showed mild non-length dependent sensory neuropathy. Cerebrospinal fluid (CSF) obtained from lumbar puncture showed elevated protein 162 mg/dL, glucose 43 mg/dL, elevated immunoglobulin G 27.2 mg/dL, oligoclonal banding, 12 white blood cells, 100% lymphocytes, and elevated angiotensin-converting enzyme 7.0 U/L.

Tuberculosis, human immunodeficiency virus, fungal infection, and syphilis were ruled out, and there was no evidence of malignancy. Pathology of the hilar and mediastinal lymph nodes obtained via endobronchial ultrasound-guided bronchoscopy showed lymphocytes and epithelioid histiocytes suggestive of granulation tissue. Combining the patient's neurologic physical examination, cerebrospinal fluid findings, radiologic chest findings, and tissue biopsy, a diagnosis of neurosarcoidosis was reached.

Discussion:

Treatment with high dose prednisone and gabapentin was initiated, and the offending culprit, etanercept was discontinued. Within weeks of initiating treatment, the patient exhibited significant clinical improvement, and in under three months, the patient had complete resolution of her neurologic symptoms. The patient's candidal esophagitis was likely triggered in the setting of immunosuppression secondary to etanercept and methotrexate, which was successfully treated with pantoprazole and fluconazole. Our case demonstrates the puzzling development of neurosarcoidosis after treatment of rheumatoid arthritis with etanercept.

Resident/Fellow Clinical Vignette

Venus Sharma, MD

Dalgis Dunker Del Rosario, MD. Icahn School of Medicine at Mount Sinai (Morningside/West).

Arpanjeet Kaur, MD. Icahn School of Medicine at Mount Sinai (Morningside/West)”

Arshdeep Dhaliwal, MBBS

Rohit Nathani, MD. Icahn School of Medicine at Mount Sinai (Morningside/West)

Adam C Rothman, MD. Icahn School of Medicine at Mount Sinai.

Icahn School of Medicine at Mount Sinai (Morningside/West).

A Case of Syndrome of Inappropriate Anti-diuretic hormone secretion during intrapartum period.

Introduction

Moderate to severe pain and nausea are well described etiologies to syndrome of inappropriate anti-diuretic hormone secretion (SIADH) (1). We report a case of SIADH in the setting of pain and nausea during the intrapartum period.

Case Presentation

We present a 34-year-old female with no past medical history who presented at full-term in active labor and became lethargic and later unresponsive during the intrapartum period.

On examination, she was noted to be hypertensive to 140/90 with otherwise stable vital signs. She was in active labor and in evident distress due to pain. During the intrapartum period, she became lethargic & eventually unresponsive. There was a possible right-sided facial droop without any other localizing neurological signs.

As part of the initial evaluation to rule out stroke, the patient had a computed tomography scan of the head (CTH) which ruled out acute intracranial pathology. A broad encephalopathy workup was performed including a complete blood count, comprehensive metabolic panel, thyroid stimulating hormone, vitamin B1, B6, B12 levels, syphilis, human immunodeficiency virus, and blood toxicology screen which revealed serum sodium level of 113. In order to rule out any underlying malignancy, chest X-Ray was performed which was unremarkable. A decision was made to perform cesarean section following which she was monitored in the ICU closely.

Detailed hyponatremia work-up was performed which revealed urine sodium was 51, urine osmolality was 198 & serum osmolality was 246 suggestive of SIADH. In coordination with the nephrology service, she was carefully treated with 100cc of 3% hypertonic saline. The goal was to increase it by ~6meq in 24 hrs. After 48 hours her mental status significantly improved which guaranteed extubation and later discharged home with appropriate follow up with her primary care physician.

Discussion:

Syndrome of inappropriate antidiuretic hormone ADH release (SIADH) is a condition defined by the unsuppressed release of antidiuretic hormone (ADH) from the pituitary gland or nonpituitary sources or its continued action on vasopressin receptors (1).

Important etiology for SIADH includes pain, which is often associated with hypersecretion of ADH, a response that is probably mediated by pain afferents (1) .

Resident/Fellow Clinical Vignette

There exists only a handful of case reports of SIADH during the intrapartum period. This case highlights the importance of early recognition during the course & appropriate treatment, given its life-threatening complications.

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Resident/Fellow Clinical Vignette

Neha Sharma, MD

Soe Winn MD, Uyioghosa Asemota MD, Syed Mujtaba Baqir MD, Tanuj Choksi MD, Steve Obanor MD, James Park MD, Meredith Pittman MD, Sarita Konka MD, Shaurya Sharma MD

Maimonides Medical Center

AUTOIMMUNE HEPATITIS: STILL A DIAGNOSTIC CHALLENGE!

Introduction

Autoimmune Hepatitis (AIH) is a chronic inflammatory disease of the liver, and is known to precipitate via trigger factors.

We present an interesting case of AIH triggered by acute Hepatitis E infection in a genetically predisposed patient.

Case Report

A 40-year-old female presented due to worsening jaundice of acute onset and elevated liver enzymes. The patient had a past history of type 2 diabetes mellitus, hypertension, hyperlipidemia. A year ago, the patient had oligoarthritis and was found to have elevated ANA (1:1280), without features of connective tissue disorder, and was clinically monitored. Home medications were metformin and losartan. Dapagliflozin and atorvastatin were introduced a month ago.

On exam, the patient had diffuse jaundice with icteric sclera. Liver enzymes were elevated in mixed hepatocellular and cholestatic pattern (Aspartate aminotransferase 1974 IU/L, Alanine transaminase 2265 IU/L, Alkaline phosphatase of 425 IU/L, Total Bilirubin 6.7mg/dL, Direct Bilirubin 4.4mg/dL, Gamma-glutamyl transferase 200IU/L). Our differential diagnosis were drug-induced liver injury, acute viral hepatitis and autoimmune hepatitis.

Serum and urine toxicology screens were negative. The patient had evidence of recent Hepatitis E infection (IgM positive), immunity to HepA (IgG), HepB (Hep Bs/Bc/Be Ab reactive, HBV DNA negative), CMV and EBV (IgG), and negative HepC and HIV. Antibody testing revealed positive ANA and RNP Ab, and negative AMA, Anti-Sm, Rib-P protein, Scleroderma, Anti-SSA/SSB Ab, and dsDNA. CT abdomen revealed fatty liver. With input from rheumatology and gastroenterology teams, liver biopsy was obtained which demonstrated architectural disarray with focal hepatocyte injury, lymphoplasmacytic inflammation with interface hepatitis, canalicular cholestasis with hepatocellular rosettes compatible with autoimmune hepatitis. The patient responded to steroid treatment, with normalization of liver enzymes on two-week follow-up.

Discussion

AIH is characterized by circulating autoantibodies and elevated serum globulin levels. It is predominantly seen in females.

It is postulated to develop by environmental trigger(s) in genetically predisposed individuals, however, in most of the cases triggers remain obscure.

Identified triggers are:

Drugs: minocycline, nitrofurantoin, melatonin, diclofenac and statins

Viral hepatitis: HepA virus, HepE virus (as seen in our patient), HepC virus, measles, EBV, HSV and SARS-Cov19 infection and vaccine

Resident/Fellow Clinical Vignette

Pathogenesis is affected by molecular mimicry and cross-reactivity between foreign epitopes and hepatic antigens. Liver biopsy is an independent factor in diagnosis and prognosis of AIH. Biopsy results are reported as typical, compatible and atypical histological features.

This case highlights the importance of being familiar with the natural course of Hepatitis E infection, which is benign and self-limited. When the patient's symptoms deviate from the norm, as in our patient, further investigation is warranted which, in our case, led to an interesting diagnosis of AIH that initially presented in the disguise of Hepatitis E infection.

Resident/Fellow Clinical Vignette

Adrian Whiting

James Ciancarelli, DO

Joseph Germano, DO

NYU Langone Hospital - Long Island

A Mysterious Bleed: A Case of Spontaneous Spinal Epidural Hematoma After Atrial Fibrillation Ablation

Spontaneous spinal epidural hematoma (SSEH) is an extraordinarily rare bleed usually occurring in the C5-T2 and T10-L2 spinal regions in the absence of any known trauma. Since first described in medical literature in 1869, only a few hundred cases have been documented through modern times. While various case reports and meta-analyses have unearthed a variety of potential etiologies, the anatomic/pathophysiologic mechanism remains under scrutiny. Some researchers believe that most SSEH originate from the epidural venous plexus, while others argue the rapid accumulation of blood points to an arterial source of bleeding.

Spontaneous spinal epidural hematomas have scarcely been documented in relation to an invasive cardiac procedure, such as coronary angiography or cardiac ablation procedures. The case presented in this report documents a 71-year-old female, having only chronic anticoagulation use as a risk factor, who underwent ablation for refractory atrial fibrillation. Post-procedure, she quickly developed lower back pain and lower extremity numbness and weakness. MRI identified an acutely expanding compressive hematoma in the T7 to L2 region. The patient was managed emergently with decompressive surgery and fully recovered her neurologic function. This case adds to our understanding about the pathophysiology and proper management of SSEH. It also expands our knowledge of potential risks of seemingly benign procedures, such as cardiac ablation.

Resident/Fellow Clinical Vignette

Brandon Wilson

Zein Kattih, MD, Bushra Mina, MD

Lenox Hill Hospital

First Time Heroin-Inhalation Leading to Pulmonary Capillaritis

Introduction

Pulmonary capillaritis is a pattern of alveolar wall inflammation which is seen histopathologically. This inflammation leads to disruption of the alveolar-capillary basement membrane and flooding of the alveoli with blood. While this diagnosis can be seen in patients with underlying vasculitis, inhalation of recreational drugs can also be a culprit. We present an interesting patient with pulmonary capillaritis secondary to heroin inhalation diagnosed on bronchoscopy.

Case

A 25 year old man with history of tetrahydrocannabinol (THC) vaping for 3 years, history of cocaine abuse, and recent heroin inhalation one week before admission presented with one day of myalgias, subjective fever, and acute worsening shortness of breath. The patient was found to be hypoxemic to 68% on room air, tachypneic to 30 breaths/min, with tachycardia to 117 beats/minute. He was afebrile. Labs were notable for leukocytosis to 20.76K/uL, elevated lactate 3.2. Drug screen was positive for THC. COVID-19 PCR was negative and HIV was nonreactive. He was started on noninvasive ventilation for respiratory failure and antibiotics for community acquired pneumonia and treated with IV fluids 30cc/kg, as the patient met SIRS criteria.

The patient underwent a chest X-ray followed by a CT angiogram of the chest. The CT was notable for diffuse ground-glass opacities more prominent centrally and with internal septal thickening bilaterally, consistent with a crazy paving pattern.

The patient underwent bronchoscopy. On inspection, blood tinged secretions were noted bilaterally, and serial BAL showed persistent but not progressive hemorrhagic fluid.

Transbronchial biopsy was performed, and histology revealed acute lung injury with fibrin and interstitial accumulation of neutrophils with nuclear dust consistent with pulmonary capillaritis. Further workup for vasculitis was negative including negative glomerular basement membrane Ab IgG, ANA, c-ANCA, and p-ANCA. The patient was treated with a 7 day course of prednisone 40mg and hypoxemia resolved.

Discussion

Pulmonary capillaritis is most commonly associated with granulomatosis with polyangiitis, microscopic polyangiitis, and lupus. The acute management of patients presenting with pulmonary capillaritis with or without diffuse alveolar hemorrhage includes identification of underlying systemic disorders and treatment with steroids. We present this case to highlight a potential uncommon case of pulmonary capillaritis in a patient with first-time inhalational use of heroin.

Conclusion

Inhalational use of any substance, usually cocaine, but in this case heroin, can lead to drug-induced capillaritis, and a high index of suspicion is required for diagnosis.

Resident/Fellow Clinical Vignette

Kimia Yavari

Joseph Grisanti

Buffalo Rheumatology and Medicine, Buffalo, USA.

Catholic Health Program, University at Buffalo

Canakinumab for Treatment of Recurrent Fevers and Proteinuria in Refractory Systemic Lupus Erythematosus

Introduction

Systemic lupus erythematosus (SLE) is a chronic multiorgan autoimmune disease with a wide range of clinical manifestations and a characteristic renal involvement leading to proteinuria in 30% to 50% of patients. Common treatments include anti-inflammatory drugs, corticosteroids, antimalarial agents, and immunosuppressant therapies. There remains an unmet need in SLE disease management as standard treatments are not always effective in moderating disease activity.

Case presentation

We report a 41-year-old female patient with a 12-year history of SLE complicated by debilitating nocturnal fevers and WHO Class IV lupus nephritis who for years was refractory to standard therapies but improved dramatically with canakinumab, an Interleukin-1 β antagonist. The standard interventions demonstrated no significant impact on her proteinuria (>3 g/24 h), joint complaints, and nocturnal fevers (101–103 °F). Additionally, her Anti-dsDNA levels remained elevated, and her kidney function did not improve significantly (with an average GFR level of 71.45–12.05). In an effort to control her fevers, canakinumab which is approved by the FDA for the treatment of Familial Mediterranean Fever was added to an experimental protocol composed of Prednisone (5–20 mg daily), Mycophenolic acid (1000 mg twice daily), and Hydroxychloroquine (200 mg twice daily). This introduction of canakinumab provided a rapid reduction in nocturnal fevers within 6 weeks (i.e., decreased in frequency by 90%). Her proteinuria has also dropped from 3.5 g/24 h to 0.274 g/24 h and her prednisone has been tapered and discontinued. In addition, her renal function has improved with an average GFR level of 84.14–7.56. There has also been a significant decrease in both ESR and anti-dsDNA levels compared with the previous treatments.

Summary

We report the first case of the use of canakinumab in SLE. We report that canakinumab could potentially represent the next step in SLE patient's treatment who have failed conventional therapies or are intolerant to them. In this case, the addition of canakinumab facilitated the tapering and ultimately discontinuing of corticosteroids. This case represents the first successful use of canakinumab in the treatment of refractory fevers and diffuse proliferative glomerulonephritis in SLE.

Resident/Fellow Clinical Vignette

Zhuo Yu, DO

Lisa Fisher, MD

Stony Brook University Hospital

Improving Hepatitis C Screening Rate in Veterans Affairs Primary Care Clinic

Introduction:

According to World Health Organization (WHO), there is an estimated 58 million people with chronic hepatitis C virus (HCV) infection. During 2019, there were 4136 acute HCV cases reported to CDC, corresponding to a 63% increase as compared to 2015. Antiviral medicine is effective in curing more than 95% of persons with HCV infection, however access to diagnosis and thus treatment remains low. In March 2020, the United States Preventive Services Task Force (USPSTF) updated HCV screening in all adults age 18-79 years old, instead of patients born between 1945-65 and high-risk patients. The new screening guideline debuted in the peak of COVID-19, so it could be easily missed. Our project aims to educate residents within Veterans Affairs (VA) primary care system regarding the new screening guideline, and analyzes the effect of low cost interventions in improving screening rate of HCV among VA patients.

Methods:

Data was collected from pre-intervention (October – December 2021) and post-intervention (March – May 2022) periods; all patients seen in clinic during these two time periods were included. Patients were considered screened if there was lab result on file for hepatitis C antibody. Interventions include educating each resident group regarding the change in screening guideline with oral presentation, and putting up reminder posters with detailed information in each patient room.

Results:

Before the initiation of the project, all residents were asked to complete a one-question survey asking whether they were aware of the USPSTF update on HCV screening. Of the 35 completed surveys, 31 had answered no.

In the pre-intervention period from October to December 2021, a total of 1242 patients were seen in VA primary care clinic. Among all 1242 patients, 379 patients were screened for HCV. Among the 863 patients that were not tested, 623 patients were within the age of 18-79.

In the post-intervention period from March to May 2022, 1174 patients were seen and 489 were screened for HCV. This time among the patient not screened, 454 falls in the age range recommended for screening.

As a result, 30% of the total veterans seen were screened for HCV, with 72% of the 863 veterans who weren't screened qualified for screening prior to intervention. After intervention, 41% of all veterans seen were screened for HCV, with 66% of remaining 685 veterans not screened qualified for screening.

Discussion:

Our data suggests that the new HCV screening guideline has not been well integrated in VA standard of practice. A low-cost intervention may be helpful in spreading awareness and improving HCV screening rate among VA patients. The ultimate goal of the project is to provide the chance to start treatment early in patients diagnosed with HCV and improve overall healthcare outcome.

New York



New York Chapter
American College of Physicians

Annual Scientific Meeting

Resident/Fellow Research

Poster Presentations

Saturday, November 5, 2022

Westchester Marriott Hotel

670 White Plains Road

Tarrytown, NY 10591

Resident/Fellow Research

Kenneth Johan

Singh, Inderpreet; Alam, Saad M; Bhaskaran, Aditya; S Duran, Israel; Padilla, Joane; Sura, Harsh; Lim, Chee Yao; Patel, Pinal; Mandadjiev, Alexander; Afzal, Afsheen; Ocrospoma, Sebastian H; Valenzuela, Anna; Menon, Vidya

Lincoln Medical Center

Burden of Disease: Assessing Social Determinants of Health and Burden of Treatment in Congestive Heart Failure Patients

AIMS

The aim of this study was to identify the qualitative difference in HFrEF and HFpEF patients with the purpose of finding barriers of treatment and social determinants of health and their impact in the quality of life for CHF patients.

METHODS

Patients admitted with CHF exacerbation were identified and consented from March to August 2022. Social Determinants of Health (SDoH) and Barriers of Treatment (BoT) questionnaire were used in both Spanish and English. Demographic and questionnaire input means were compared between HFrEF and HFpEF patients. Multivariate linear regression model was utilized to find the relationship between BoT and SDoH on all CHF patients after adjusting for age sex and race.

RESULTS

Of the 113 patients, 39 had HFpEF while 74 had HFrEF. Both cohorts were similar in terms of age, ethnicity and education level. Greater proportion of females had HFpEF (67% vs. 19%, $p < 0.001$). Alcohol use, smoking and substance use were more prevalent in patients with HFrEF (39.2% vs 7.7%, 33.8% vs 10.3%, 39.2% vs 18% respectively). Patients with HFrEF had more 30 day readmission, although we found no statistical significance (3% vs 14.9%, $p = 0.095$). However, result showed that no statistically significant differences were found in SDoH and BoT between both groups, except HFpEF patients who had higher score in role and social activities limitation domain in BoT (44.5% vs 30.4%, $p = 0.026$). Although not significant, BoT is higher in HFpEF patients in the difficulty with healthcare services domain (30% vs 23.5%), health monitoring (30.9% vs 21.9%), medication refills, organization and administration (19% vs 13.2%), understanding medical information, disease process and treatment (28.4% vs 23.7%). In the SDoH segments, HFpEF patients scored higher in requiring help with welfare, SSI and SSD (35.9% vs 27.0%), while HFrEF patients experienced more issues with food insecurity (25.7% vs 12.8%) and housing instability (35% vs 27%).

Less than high school education was associated with lower physical and mental exhaustion after controlling for age, gender and race. Food insecurity was associated with higher physical and mental exhaustion and lower medical information. Currently employed patients were more likely to keep and follow-up on medical appointments. Patients with fear of losing housing in two months had the lowest number of social interactions and increased medical and healthcare expenses. Alcohol use was associated with more physical and mental exhaustion, leading to burden of healthcare expenses. Substance use patients were more likely to miss medical appointment with different healthcare providers.

CONCLUSIONS

We found that patients with alcohol, substance use and smoking cigarettes are associated with HFrEF compared with HFpEF. HFpEF patients had overall worst scores in SDoH and BoT that impacted QoL. We believe that identifying and addressing BoT and SDoH is crucial in managing CHF.

Yusra Nasir, MD

Siddharth Agarwal MD, Khawaja Hassan Akhtar MD, Usman Baber MD

Montefiore Medical Center-Wakefield Campus

Direct-acting Oral Anticoagulants versus Vitamin K Antagonists in Patients Undergoing Transcatheter Aortic Valve Replacement: A Systematic Review and Meta-analysis

Background: Approximately one-third of patients undergoing transcatheter aortic valve replacement (TAVR) have an indication for long-term anticoagulation. We have compared the efficacy and safety of direct-acting oral anticoagulants (DOACs) versus vitamin K antagonists (VKA) in patients undergoing TAVR with an indication of long-term oral anticoagulation.

Methods: A systematic search was conducted by 2 independent researchers using PubMed, EMBASE, Ovid Medline, and Cochrane Database from inception till May 2022, for studies comparing DOACs with VKA in patients undergoing TAVR. Outcomes of interest included all-cause mortality, any bleeding complication, stroke, cardiovascular mortality, major vascular complications, and risk of acute coronary syndrome.

Results: A total of 14 studies (4 randomized control trials and 10 observational studies) with 36,182 patients were included for final analysis. DOACs were used by 13,077 patients, and 22,465 patients received VKA. Patients receiving DOACs had statistically significantly lower all-cause mortality (RR: 0.84; CI: 0.73 - 0.97; $p=0.05$), and major vascular complications (RR: 0.69; CI: 0.52 - 0.90; $p<0.01$) as compared to those receiving VKA. Patients receiving DOACs did not show a statistically significant difference in terms of any bleeding complication (RR: 0.99; CI: 0.73 - 1.34; $p=0.95$), stroke (RR: 0.87; CI: 0.66 - 1.15; $p=0.32$), cardiovascular mortality (RR: 0.95; CI: 0.72 - 1.26; $p=0.74$), or acute coronary syndrome (RR: 0.91; CI: 0.51 - 1.60; $p=0.73$).

Conclusion: In patients undergoing TAVR who require long-term anticoagulation, the use of DOACs provides comparable safety, and is associated with lower all-cause mortality and major vascular complications, as compared to patients receiving VKA therapy.

Yusra Nasir, MD

Satyam Krishan MD, Khawaja Hassan Akhtar MD, Sardar Hassan Ijaz MD, Sourbha Dani MD

Montefiore Medical Center Wakefield Campus

Comparison of Clinical Outcomes in Transcatheter Aortic Valve Replacement with Edwards Sapien 3 versus Evolut Series: A Systematic Review and Meta-analysis.**Background:**

The third generation transcatheter heart valve system aimed to improve the safety of transcatheter aortic valve replacement (TAVR). We performed systematic review and meta-analysis to compare clinical outcomes after TAVR with Edwards Sapien 3 (ES3) and Evolut series (MER).

Methods:

A systematic search was conducted by 2 independent researchers in MEDLINE and EMBASE for studies comparing clinical outcomes after TAVR with ES3 and MER. 1 randomized controlled trial and 11 observational studies met the inclusion criteria. Mantel-Haenszel odds ratios were calculated, and for heterogeneity I² statistics were reported.

Results:

12 studies with total 7,749 patients were included for final analysis. ES3 and MER were implanted in 4,333 and 3,416 patients respectively. ES3 showed statistically significant decrease in permanent pacemaker implantation at 30-days (OR: 0.60; 95% CI: 0.52-0.70; $p < 0.05$). Furthermore, TAVR with ES3 showed non-statistically significant trend towards decreased all-cause mortality at 30 days (OR: 0.73; 95% CI: 0.51-1.02; $p=0.07$), and stroke at 30 days (OR: 0.55; 95% CI: 0.27-1.10; $p=0.09$). Cardiovascular mortality (OR: 1.03; 95% CI: 0.50-2.15; $p=0.93$), and acute kidney injury (OR: 1.08; 95% CI: 0.83-1.41; $p=0.56$) did not show statistically significant difference.

Conclusion:

While ES3 and MER had similar clinical outcomes, patients undergoing TAVR with ES3 had statistically significant decrease in permanent pacemaker implantation and hence may be favored in patients with pre-existing conduction system disease.

Prakruti Pandya

TIMUR YAROVINSKY, MD, PhD

JEFFREY R. BENDER, MD

University at Buffalo- Catholic Health System**Relieving miRNA-mediated Posttranscriptional Constraint of Bmx: A Potential Therapeutic Target for Promoting Angiogenesis**

INTRODUCTION

Capillary angiogenesis is a critical physiologic response to tissue ischemia, essential in maintaining adequate tissue perfusion and survival. Macrophages, either recruited as part of the "inflammatory response" to ischemia, or tissue-resident (ischemia-activated), are critical producers of pro-angiogenic factors. These factors are encoded by short-lived mRNAs that are subject to microRNA mediated repression, while competitively protected by RNA-binding proteins like HuR. HuR (Human antigen R), is best known for its RNA-stabilizing property. We identified Bone Marrow Tyrosine Kinase on Chromosome X (Bmx), a known pro-angiogenic factor, as a hypoxia-induced transcript.

Our hypothesis is that selectively blocking repressive miRNA binding on Bmx's 3'UTR, and favoring a protective HuR interaction, is a novel pro-angiogenesis strategy in ischemic tissues. To that end, we addressed the regulation of Bmx expression through molecular interactions with its 3'UTR.

METHODS

- Establishing Bmx properties: Hypoxia induction and HuR dependence:

Bone marrow derived macrophages (BMDMs) were harvested from the bones of wild type (WT) and myeloid-specific HuR knockout (KO) mice. These macrophages were subjected to either normoxic or hypoxic (1% O₂) conditions for 16 hours. Cells were lysed to measure Bmx mRNA by qRT-PCR, protein levels by immunoblotting, and perform RNA decay assays in the presence of a transcription inhibitor, Actinomycin D.

- Candidate miRNA analysis:

Candidate miRNAs were validated with in vitro transcribed 3'UTR-miRNA pulldown techniques and RT- qPCR.

- Presence of HuR at the Bmx 3'UTR:

Lysates from the BMDMs under conditions preserving protein-mRNA interactions were immunoprecipitated with HuR or control (IgG).

RESULTS

- Macrophage Bmx hypoxia induction and HuR dependence: Bmx RNA levels, normalized to microglobulin RNA, revealed HuR-dependence ($p=0.042$, $n=8$). Protein levels were significantly lower in HuR KO, and not hypoxia-induced in the absence of HuR ($p=0.018$, $n=5$).

- Effect of HuR on Bmx mRNA decay: The RNA stability curves were plotted by analyzing mRNA levels at 30-minute intervals for 2 hours. The half-times were HuR KO $t_{1/2}=8$ min, WT $t_{1/2}=21$ min.

- Validation of computationally predicted miR-16 binding to the Bmx-3'UTR: A 2600-fold increase in miR-16-Bmx-3'UTR binding was observed in the absence of HuR.

Resident/Fellow Research

- HuR-BMX mRNA association: The HuR-Bmx-3'UTR immunoprecipitation displayed an abundance of Bmx transcript, relative to the isotype Ig control.

CONCLUSION

The upregulation of macrophage Bmx transcripts in hypoxic conditions simulates ischemic responses. The absence of this upregulation in HuR KO BMDMs indicates a regulatory role of HuR, which is further confirmed by the RNA stability studies. The active competition between HuR and miRNA, wherein higher expression of miR-16 is seen in the absence of HuR, suggesting a lack of typical HuR-miR competition. Our data are the first to document the influential HuR-miR-16 interaction on the Bmx 3'UTR, which has therapeutic implications.

FUTURE DIRECTION

Mapping and interference studies at Bmx 3'UTR specific binding site of miR-16.

Resident/Fellow Research

Alberto Romero Garcia, MD

Afsheen Afzal, MD; Shah, Virali, MD; Ariane Yangco, MD; Dwayvanya Miller, MD; LaFortune, Alexander, MD; Hennessey, Karen, MD; Addi Feinstein, MD; Vidya Menon, MD

Lincoln Medical and Mental Health Center

Analysis of COVID-19 infection outcomes and baseline characteristics in HIV patients admitted to a community hospital in the South Bronx.

Introduction

There is conflicting evidence regarding the outcomes of COVID infection in HIV patients. While some studies point to worse outcomes, there is limited data regarding the impact of other comorbidities or HIV-associated clinical parameters such as CD4 counts or viral loads. As the data regarding mortality and the morbidity of COVID infection impacting the HIV population continues to evolve, it is apparent there is limited information regarding outcomes associated with vital and clinically relevant parameters such as CD4 count, viral loads, and the presence of other comorbidities. The aim of this study is to compare mortality outcomes in patients with HIV and those without with respect to baseline characteristics and severity of COVID infection

Methods

This is a single-center retrospective study including all patients admitted with COVID-19 infection from March 1, 2020, to December 31, 2021. The two cohorts compare outcomes in patients with HIV to patients without HIV with respect to Covid 19 infection severity, markers of HIV disease burden (CD4/Viral load), and baseline characteristics

Result

Of the total 1902 patients admitted with COVID-19 infection, 78 (4.1%) were PLWH. PLWH were younger (mean 55) vs non-HIV (mean 62), primarily Hispanic 43.6% and African American 34.6%. Both cohorts had a similar number of patients with HTN, DM, CHF, CKD, cirrhosis, and cancer, but a significantly higher prevalence of COPD/asthma and HepB/HepC. Length of stay was comparable in both groups. Overall mortality was higher in the non-HIV cohort (27.8% vs 15.4%; $p = 0.016$). However, When matched for age, both cohorts had similar rates of mortality in Covid infection severe/critical severity. A large percentage of expired patients within the HIV cohort had undetectable viral loads (83%, $p = 0.001$); 75% had CD4 counts >200 ($p = 0.616$) Bivariate analysis suggests that the severity of COVID-19 infection is associated with a higher likelihood of mortality (LR). while controlling for age, a multivariate logistic regression looking at comorbidities revealed that HIV status did not have any significant impact on mortality due to COVID-19.

Conclusion

Contrary to initial suspicion, our study demonstrated no significant difference in mortality in patients within both cohorts with respect to the severity of COVID -19 infection and comorbidities. On average, patients who expired with HIV had higher rates of detectable Viral load and CD4 counts, suggestive of possible unknown immune response related to outcomes. Overall, this study reveals that HIV status did not significantly impact mortality due to COVID-19.

Resident/Fellow Research

Alberto Romero Garcia, MD

Lim Chee Yao, Rabia Ashraf, Pinal Patel, Afsheen Afzal, Vidya Menon, Jeanie Gonzales, Israel Duran, Inderpreet Singh, Kai Wang.

Lincoln Medical and Mental health center, NYCHHC

Statin Use and Morbidity-Mortality Outcomes in Patients with Acute Stroke with LDL \leq 70 mg/dL: Initial Results from prospective stroke registry.

Introduction

Since there is a dearth of information, it is unclear if statins are useful in individuals with stroke outcomes who present with stroke and have LDL \leq 70 mg/dl. The objective of our study is to establish a special registry, prospectively follow individuals with CVA with an LDL 70 mg/dl (with and without statin therapy) and analyze their fatal/nonfatal cardiovascular events over five years.

Method

Patients who had been hospitalized for stroke and had LDL \leq 70 mg/dl between January 2021 and May 2022 are included in the study. Review of medical records from the stroke registry was done. Two groups were compared (A: Patients on statin before admission vs. B: statin naive patients).

Result

119 (25%) of the 469 patients who were admitted for a stroke had LDL \leq 70. Before index admission, 51.3% were taking a statin (group A), while 48.7% were statin naive (group B). Other comorbidities like DM (45% vs 64%), CHF (7% vs 28%), CAD (14% vs 34%), Atrial Fibrillation (8.6% vs 16%), and Valvular heart disease (0% vs 6.6%) had lower prevalence in group B. Hemorrhagic stroke was more common in Group B (23% vs. 8%). Among statin naive group, 53.4%, 20.7%, and 25.9% patients had low (0-5), moderate (6-14) and high NIHSS (>14) respectively vs 57.4%, 24.6%, and 18% in group A. Inpatient mortality during index admission in group B is higher 22% than 11% in Group A. Patients in group B with statins begun during admission exhibited lower modified Rankin Scale (mRS) scores at discharge compared to patients without statins started (mRS 0 = 36.6% vs 0%, mRS 4 = 17.1% vs 29.4%, and mRS 5 = 9.8% vs 17.6%). Out of 119 patients, we followed 54 prospectively and found to have 37% mortality rate in statin naive group vs 2.2% with patients who were continued or started on statin.

Conclusion

Patients who were not taking statins at baseline and had LDL \leq 70 mg/dl were at greater risk of hemorrhagic stroke, greater NIHSS score on admission, a lower functional level on discharge, and a higher mortality rate after discharge on 6-12 months follow-up. When compared to patients who were never initiated on a statin, those who received a statin during their initial stay had higher functional status upon discharge and lower mortality. In stroke patients with LDL \leq 70, our study shows that statin therapy improves morbidity and mortality outcomes. We hope to achieve significant results with an ongoing prospective registry to determine the preventive effects of statins in patients with LDL \leq 70, despite the fact that our current data is preliminary and limited due to the number of patients followed and inability to confirm compliance with statin therapy.

Virali Shah

Borthelle, M; Miller, D; Ocropsoma Heraud, S; Gandarillas Fraga, S; Gogolauri; Adderley, N; Singh, I; Saad, A; Teferici, S; Menon, V

NYC H+H: Lincoln Medical + Mental

Retrospective evaluation of fluid administration in patients with sepsis, sepsis induced hypotension and septic shock with respect to mortality

Purpose: With new research highlighting the benefit of restricted fluid administration in sepsis, it is important to study the overall mortality as stratified by volume resuscitation. This study evaluated mortality on discharge based on volume resuscitation in patients with sepsis, sepsis induced hypotension and septic shock at completion of 3-hour bundle and on large vs small volume resuscitation within 24 hours.

Methods: This is a single center, retrospective study that compares adult patients with sepsis, sepsis induced hypotension (initial MAP <65 with improvement via fluid within 3 hours) and septic shock (persistent MAP <65) admitted to medicine/ICU. Cancer, hospice, surgical and trauma patients were excluded. Data for all cohorts was compared by evaluating baseline characteristics, compliance to the 3-hr bundle (cultures, antibiotics, lactate, and 30cc/kg of fluids for hypotension) and mortality as stratified by the amount of fluid administered via the 3-hr and 24-hr mark. Small volume resuscitation is defined by less than 4 liters and large volume is minimum of 4 liters within 24 hours of hospital admission.

Results: Overall, 660 patients from January 2021 to December 2021 were included and divided into three cohorts: sepsis (495), sepsis induced hypotension (35) and septic shock (130). Age and gender were equally distributed among cohorts (p 0.5; p 0.39). All cohorts had equal distribution of patients with Asthma/COPD, HTN, DM, and CKD. However, the shock cohort had more CHF (p 0.002) and cirrhosis (p 0.01). Compliance to the 3-hr bundle was low overall (19% in sepsis, 40% in hypotension, 40% in shock, p< 0.001). Mortality was higher in those not compliant to the bundle across all cohorts: sepsis (20% vs 14%, p 0.19); hypotension (67% vs 21%, p 0.009); shock (51% vs 30%, p 0.031). In sepsis, median volume received at 3 hours was 1 liter (IQR=0.5-2) or 13cc/kg (IQR=8-22), in hypotension it was 2 liters (IQR 1-2) or 27cc/kg (IQR=19-24), in shock it was 1.45 liters (IQR=0-2) or 19cc/kg (IQR=0-19).

Overall, mortality was comparable between small and large volume resuscitation (33% vs 30%, p 0.59). In 24 hours, the median volume in sepsis was 2 liters (IQR=1-3.5), in hypotension it was 3 liters (IQR=2-5). In shock it was 2 liters (IQR=1-4). In sepsis, mortality was comparable in small vs large volume resuscitation (20% vs 15%, p 0.2). In both hypotension and shock, mortality was higher in small volume resuscitation [hypotension: (58% vs 38%, p 0.2); shock: (47% vs 40%, p 0.4)].

Conclusions: Though the comparison of small and large volume resuscitation overall shows minimal difference, there is higher rate of mortality in sepsis induced hypotension and shock cohorts. Compliance to the 3-hour bundle suggests an improved outcome across all cohorts, signifying at least minimum level of fluid therapy is cornerstone.

Daming Shao, MD

Alejandra Londoño Jimenez, Maria Salgado Guerrero, Anna Broder, Shudan Wang

Albert Einstein College of Medicine/Jacobi Medical Center

FACTORS ASSOCIATED WITH WORSENING INTERSTITIAL FIBROSIS/TUBULAR ATROPHY IN LUPUS NEPHRITIS PATIENTS UNDERGOING REPEAT KIDNEY BIOPSY

Background: Lupus nephritis (LN) is one of the most severe manifestations of systemic lupus erythematosus (SLE), with 10 to 30% of LN patients progressing to end-stage renal disease (ESRD) within ten years. Increasing evidence has shown that tubulointerstitial injury, especially interstitial fibrosis/tubular atrophy (IFTA), is a strong predictor of progression to ESRD. However, factors associated with worsening IFTA on repeat kidney biopsy are not well studied. The objective of this study was to evaluate the demographic, clinical, and histopathological factors associated with progression from none-mild IFTA on index kidney biopsy to moderate-severe IFTA on clinically indicated repeat kidney biopsy in LN patients.

Methods: We identified patients with SLE by the 1997 American College of Rheumatology (ACR) or the Systemic Lupus Erythematosus International Collaborating Clinics (SLICC) criteria who underwent an index kidney biopsy between 1997 and 2020. Patients with LN Class I, II, III, IV, V, and mixed based on the 2003 International Society of Nephrology (ISN) and the Renal Pathology Society (RPS) classification on index biopsy who underwent a clinically indicated repeat kidney biopsy were identified. Chart reviews were performed to obtain demographic, clinical and histopathological data. None-mild IFTA was defined as <25% acreage of the interstitium affected by fibrosis and atrophy, and moderate-severe IFTA was defined as ≥25% of the interstitium affected. Patients who had none-mild IFTA on index biopsy and progressed to moderate-severe IFTA on repeat biopsy were defined as progressors. Patients with none-mild IFTA on both biopsies were defined as non-progressors.

Results: Of the 150 SLE patients with biopsy-proven LN, 55 underwent a clinically indicated repeat kidney biopsy. Of these 55 patients included, forty-four (80%) were women, twenty-six (43%) self-identified as Black or African American, and 28 (51%) self-identified as Hispanic or Latino. Twenty-five (45%) progressed from none-mild to moderate-severe IFTA. Compared to non-progressors, progressors were older (median age 29.2 [20.3-39.1] vs. 21.6 [14.6-27.9] years old, $p=0.05$), included a higher proportion of patients with low eGFR (CKD EPI <90 mL/min/1.73m²) (11 [44%] vs. 5 [17%], $p=0.03$) and proliferative LN (14 [56%] vs. 6 [21%], $p=0.01$). Progressors included a lower proportion of Black or African American patients (8 [32%] vs 18 [60%], $p=0.04$) and a lower proportion of patients receiving Azathioprine (4 [16%] vs. 13 [45%], $p=0.02$). There was no difference between the two groups with regards to median years from index to repeat biopsy, hypertension, diabetes, hypocomplementemia, or immunofluorescence (IF) staining of C1q or C3 on index biopsy. Multivariable logistic regression analysis showed that proliferative LN was associated with IFTA progression (OR 4.92, 95% CI 1.33-18.28, $p=0.02$).

Conclusion: Proliferative LN was associated with a higher risk of IFTA progression, suggesting that glomerular damage is one of the major drivers of IFTA progression in SLE.

Calvin Ta**Maimonides Medical Center****A MODIFIED FALLS SCORING SYSTEM SERVES AS A PREDICTOR OF HOSPITAL FALLS RISK**

Introduction: Accidental inpatient falls (AIF) are common and may lead to serious injuries. There are no widely accepted scoring tools to predict AIF. We conducted a retrospective case-controlled study to evaluate AIF risk factors and to develop a scoring system to improve the predictability of AIF.

Methods: A retrospective review included all patients with accidental falls on an inpatient medicine service at Maimonides Medical Center during a five-year period including an age and sex matched control group who did not fall. A falls risk score was calculated based on a study done by Kobayashi et al. A score of 1 or 0 was assigned to each risk factor and then summed as our primary fall risk score (PFRS). Patients were classified into three groups: PFRS 1-3 = low risk, 4-6 moderate risk, ≥ 7 = high risk. We developed an alternative falls risk score (AFRS) to improve score accuracy. Comparisons were analyzed with chi-square and t-tests, consistency and reliability were calculated with Cronbach's α . A Pearson's product moment correlation test to evaluate if and how our different fall risk scores were correlated with each other.

Results: Patients were 67.11 \pm 17.7; 16.05 years old and 35.32% of patients were female. The median fall risk score was 4 (3, 6 IQR) and 44.28%, 36.07%, and 19.65% of patients had a moderate, low, or high fall risk grade, respectively. A history of falls was significantly associated with AIF ($p < 0.001$). 22.89% of patients with AIF had a history of falls. Patients who did not fall had more individuals with a low-risk grade (48.76% vs. 23.38%), patients who fell had more individuals with a moderate (49.75% vs. 38.81%) or high (26.87% vs. 12.44%) fall risk grade versus the control group. Sedatives, psychotropics increased the odds of falling by a factor of 3.182 and 1.587 times versus individuals who do not use these drugs ($p < 0.05$). Ambulatory assistance/unsteady gait had 1.907 times increase in the odds of falling versus control group ($p = 0.022$). Agitation had a significant increase in the odds of falling by of 3.93 times versus patients without agitation ($p = 0.001$). Patients with a moderate or high fall risk grade had statistically greater odds of falling than patients with a low fall risk grade ($p < 0.001$). One unit increase in PFRS was associated with 35.4% increase in the odds of falling ($p < 0.001$). One unit increase in the AFRS was associated to a 50.5% increase in odds of falling ($p < 0.001$).

Conclusion: Our alternative falls risk score significantly improved the accuracy of predicting AIF. Prospective studies are needed to further validate this modified scoring system.

Resident/Fellow Research

Jimmy Wang, MD

Marat Mavliutov, MD; Nisarg Thakker, MBBS

Bassett Medical Center

Obesity and Pneumococcal Pneumonia: Result From National Inpatient Sample

Introduction:

The prevalence of obesity has been rapidly increasing for the past two decades in the US and other developed countries. The Association of obesity with an increased risk of cardiovascular, respiratory, and endocrine disorders is well established. However, the correlation of infectious disease severity with obesity requires more investigation. We conducted data analysis to examine the association of obesity with the severity of pneumococcal pneumonia in the inpatient setting.

Method:

A population-based retrospective cohort study was conducted using the 2019 National Inpatient Sample database. We included adults (age ≥ 18 yr) hospitalized for pneumonia due to streptococcus pneumoniae. Underweight patients were excluded from the study. Internal Classification of Diseases, Tenth Revision codes were used to identify underweight patients, obese patients, intubations during hospitalizations, OSA, COPD, and tobacco use. Adjusted logistic regression was used to assess the association between obesity and the rate of intubation, as well as in-hospital mortality. Adjusted linear regression was used to compare the hospital length of stay between the obese group and the non-obese group. Results were adjusted for age, OSA, COPD, and tobacco use.

Result:

A total of 102,279 patients were included in the study and 11% of the included patients were obese. The association between obesity and rate of intubation was not statistically significant, with odds ratio [OR] = 1.09; 95% confidence interval [CI]= 0.94-1.27; $p= 0.245$. Obese patients also didn't show statistically significant different hospital length of stay with regression coefficient [B] = 0.006; 95% confidence interval [CI]= -0.335- 0.346; $p= 0.975$. However, the obese patients did show lower hospital mortality, with odds ratio [OR] = 0.67; 95% confidence interval [CI]= 0.527-0.843; $p=0.001$.

Discussion:

This is a population-based study of adults hospitalized for streptococcus pneumonia, obesity was found to be associated with lower hospital mortality and was not found to be associated with more use of ventilators or longer length of stay. The results were counterintuitive, but the decreased mortality is consistent with existing data on obesity and acute respiratory distress syndrome, which also shows that obese patients appear to have lower mortality. A further prospective cohort study that accounts for other variables such as differences in treatment interventions, level of hypoxia on admission, and time between admission and intubation might be helpful.

Resident/Fellow Research

Rejoy Zachariah

Anandan S, Bayer RL, DeCastro GA

Zucker School of Medicine at Hofstra/Northwell

CHASE: A Novel Inpatient Rotation for Palliative Medicine Fellows Focusing on Hematologic Malignancies

Objective:

To assess and improve clinical competencies for HPM fellowship trainees across multiple domains related to the care of patients with hematologic malignancies.

Methods:

From July 2021 to June 2022, four HPM fellows at North Shore University Hospital participated in a novel 2-week rotation focused on early integrated palliative medicine for several populations of patients with hematologic malignancies. This rotation was named CHASE (Cellular therapies, Hematologic malignancies, And Stem cell transplant Experience). Fellows participated in a self-administered survey before the rotation to assess their knowledge, attitudes, and practice across twelve domains applicable to care of patients with hematologic malignancies. The rotation consisted of four parts: i) providing palliative consultation for stem cell transplant patients, cellular therapy patients, or leukemia patients; ii) self-directed learning from an eight-day curriculum using an inverted classroom model; iii) conducting targeted chart reviews to reinforce reading; and iv) delivering two capstone presentations on the last day highlighting a specific disease (e.g APL) or treatment modality (e.g. CAR-T), and addressing a clinical conundrum utilizing vignettes. At the conclusion of the rotation, fellows completed the same survey.

Results:

All four fellows completed the pre-rotation and post-rotation survey. Overall, there was a substantial increase across all domains of knowledge, attitudes, and practice. Survey components included questions regarding patient exposure, familiarity with diagnosis and prognosis, disease and treatment-related symptom burden, treatment indications and adverse effects, and patient/caregiver reported outcomes.

Conclusion:

As palliative medicine moves upstream for patients with hematologic malignancies, workforce development involving this population will be paramount for trainees. The pilot CHASE rotation for HPM fellows enhances exposure and cultivates expertise in recognizing and managing the complexities within this cohort. Broader adoption of innovative palliative care rotations may foster greater access to palliative care for hematologic cancer patients and a deeper knowledge base for fellows.

Kaiwen Zhu, MD

Hongli Liu, M.D., Chengu Niu, M.D., David Kaelber, M.D., Ph.D., MPH

Rochester General Hospital**6-month outcomes in breakthrough COVID-19 infection in fully vaccinated population in US: a retrospective propensity score-matched study**

Introduction:

The use of SARS-CoV-2 vaccines represents an important milestone in the response to the COVID-19 pandemic. However, the clinical outcomes in fully vaccinated population who had breakthrough COVID-19 infection compared with those who were never infected remain unclear. In this study we aim to assess mortality, hospitalization, and intensive care unit (ICU) admission rate among adults with breakthrough COVID-19 infection after full vaccination.

Method:

In this retrospective propensity score-matched cohort study, we used data obtained from the TriNetX electronic health records network (with over 89 million patients in the US) from 1/1/2021 to 7/31/2022. Our primary cohort comprised 54,535 adult patients who had a COVID-19 diagnosis or positive SAR-CoV-2 PCR test, whichever occurs 2 weeks after full vaccination (defined following CDC guideline at 14 days after first Janssen (Johnson & Johnson) vaccination or 14 days after second Pfizer-BioNTech (BNT162b2) or Moderna (mRNA-1273) vaccination. The control cohort included 1,193,280 adult patients who received full vaccination but never had COVID-19 infection. We compare the rate and hazard ratio of mortality, hospitalization, and ICU admission in 6 months after a confirmed diagnosis of COVID-19 with those in propensity score-matched cohort who did not have COVID-19 infection.

Results:

Among patients diagnosed with breakthrough COVID-19 infection after full vaccination, in the following 6 months, all-cause mortality rate was 1.57%, 14.88% were hospitalized and 0.39% were admitted to ICU. In group with full vaccination and without COVID-19 infection, the all-cause mortality rate was 0.61%, 7.79% were hospitalized and 0.18% were admitted to ICU. The mortality rate was higher in patient who had breakthrough COVID-19 infection after full vaccination (hazard ratio [HR] 3.06, 95% CI 2.70–3.48). The hospitalization and ICU admission rate were also higher in the primary group (HR 2.35, 95% CI 2.26–2.44 for hospitalization and 2.67, 95% CI 2.09–3.40 for ICU admission). HRs were higher in patients who were above 50 years old (3.40, 95% CI 2.97–3.88 for mortality, 2.42, 95% CI 2.31–2.52 for hospitalization and 3.30, 95% CI 2.17–5.02 for ICU admission) compared with those less than 50 years old (2.32, 95% CI 2.14–2.52 for mortality, 2.35, 95% CI 2.26–2.44 for hospitalization and 2.48, 95% CI 1.82–3.38 for ICU admission).

Conclusions:

Individuals with breakthrough COVID-19 infection after full vaccination are still at increased risk of death, hospitalization, and ICU admission compared with those who are not infected. The risks were greater in patients above 50 years old. The findings emphasize the importance of primary prevention of breakthrough COVID-19 infection in the fully vaccinated population.