Department of Medicine
Research Excellence and Discovery Day

32nd Annual Residents' RESEARCH DAY

May 25 and May 26, 2021

BRIGHTER WORLD

HEALTH SCIENCES
Department of Medicine

McMaster University

McMaster University
Faculty of Health Sciences

Department of Medicine
32nd Annual
Residents' Research Day in Medicine

May 25 & 26, 2021

Director Resident Research – C. Ribic

Special thanks to our judges:

Scientific: D. Conen, A. Molnar, A. Holbrook
Clinical: A. Ahmed, R. Amer, J. Adams
Subspecialty: K. Woodward, J. Dionne, A. Mathew
Timekeepers: K. Beattie, J. Huynh, M. Wang, S. Mithoowani

Virtual Presentations

Program

May 25, 2021

1:00 – 3:15 **Scientific Poster presentations**
1:15 – 4:30 **Clinical Poster presentations**
1:30 – 3:45 **Medicine Specialty Poster presentations**

May 26, 2021

12:30 **Keynote address – Dr. Emilie Belley-Côté**
"Research is a team sport"

1:00 **2021Research Grant winners announced**

1:20 – 3:00 **Oral presentations**

3:45 – 4:45 **Awards Ceremony**
Research Day awards
Resident awards
Faculty teaching awards

ORAL PRESENTATIONS

POSTERS - SCIENTIFIC

POSTERS - CLINICAL

Oral Presentations

1 – 8

1 - O Clinician Perspectives on Caring for Dying Patients During the Pandemic

Background: The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic has affected the hospital experience for patients, visitors and staff.

Objective: To understand clinician perspectives on adaptations to end-of-life care for dying patients and their families during the pandemic.

Design: Mixed-methods embedded study. (ClinicalTrials.gov: NCT04602520)

Setting: 3 acute care medical units in a tertiary care hospital from 16 March to 1 July 2020.

Participants: 45 dying patients, 45 family members, and 45 clinicians. Intervention: During the pandemic, clinicians continued an existing practice of collating personal information about dying patients and "what matters most," eliciting wishes, and implementing acts of compassion.

Measurements: Themes from semi-structured clinician interviews that were summarized with representative quotations.

Results: Many barriers to end-of-life care arose because of infection control practices that mandated visiting restrictions and personal protective equipment, with attendant practical and psychological consequences. During hospitalization, family visits inside or outside the patient's room were possible for 36 patients (80.0%); 13 patients (28.9%) had virtual visits with a relative or friend. At the time of death, 20 patients (44.4%) had a family member at the bedside. Clinicians endeavored to prevent unmarked deaths by adopting advocacy roles to "fill the gap" of absent family and by initiating new and established ways to connect patients and relatives.

Limitation: Absence of clinician symptom or wellness metrics; a single-center design.

Conclusion: Clinicians expressed their humanity through several intentional practices to preserve personalized, compassionate end-of-life care for dying hospitalized patients during the SARS-CoV-2 pandemic.

Authors: Brittany Dennis, PGY2
Supervisor: Dr. D. Cook

2 - O Efficacy and Safety of Tranexamic Acid in Acute Traumatic Brain Injury. A Systematic Review and Meta-analysis of Randomized Controlled Trials

Background: Tranexamic Acid (TXA) is used for a number of indications, including blunt trauma, based on evidence that it improves survival. Its role in acute traumatic brain injury (TBI) is less certain, although a recent large trial suggested it may improve head-injury related deaths. We conducted a systematic review and meta-analysis, to investigate the efficacy and safety of TXA in acute TBI.

Methods: In this systematic review and meta-analysis, we searched MEDLINE, PubMed, EMBASE, CINHAL, ACPJC, Google Scholar, and unpublished sources from inception until June 24, 2020 for randomized-controlled trials comparing TXA and placebo in adults and adolescents (≥ 15 years of age) with acute TBI. We screened studies and extracted summary estimates independently and in duplicate. We assessed the quality of evidence using the grading of recommendations assessment, development, and evaluation approach.

Results: Nine RCTs enrolled 14,747 patients. Compared to placebo, TXA had no effect on mortality (RR 0.95; 95% CI 0.88–1.02; RD 1.0% reduction; 95% CI 2.5% reduction to 0.4% increase, moderate certainty) or disability assessed by the Disability Rating Scale (MD, − 0.18 points; 95% CI − 0.43 to 0.08; moderate certainty). TXA may reduce hematoma expansion on subsequent imaging (RR 0.77; 95% CI 0.58–1.03, RD 3.6%, 95% CI 6.6% reduction to 0.5% increase, low certainty). Risks of adverse events (all moderate, low, or very low certainty) were similar between placebo and TXA.

Conclusions: In patients with acute TBI, TXA probably has no effect on mortality or disability. TXA may decrease hematoma expansion on subsequent imaging; however, this outcome is likely of less importance to patients. The use of TXA probably does not increase the risk of adverse events.

Authors: Kumait Al Lawati PGY5 Critical Care & Emergency Medicine, Hussein Al Rimawai PGY3 Emergency Medicine
Supervisor: Dr. B. Rochwerg

3 - O A pilot study to reduce off-label telemetry on the Nephrology Unit

Background: Findings from various studies indicate that telemetry monitoring is often overused in non-ICU settings. The American Heart Association's (AHA) guidelines provide recommendations on the use of telemetry outside the intensive care unit (ICU). In Canada, the Choosing Wisely campaign has identified telemetry utilization as a target for reduction and has advocated that non-ICU telemetry should only be used when indicated and systems should be in place for the discontinuation of telemetry.

Methods: We utilized an interrupted time series design to ascertain baseline telemetry data in the 16-month preintervention period, and 12-month post intervention period. Data for all telemetry orders (indication, duration) were reviewed. Shadowing was completed with telemetry and floor nurses and residents were polled to assess their familiarity with the AHA guidelines and comfort with discontinuing telemetry.

Results: Our audit showed the median percentage of class III telemetry was 56.9% and the median duration was 48 hours, 69% of calls from CCU were related to telemetry error, 48% of the calls were after 5pm and most residents (80%) were not comfortable discontinuing telemetry on-call. Post intervention 1 (changing of telemetry indications to match AHA guidelines in Dovetail) the median percentage of class III telemetry decreased to 21% and was sustained for 12 months. For intervention 2, we created a nursing driven medical directive to discontinue telemetry for the four most common indications A pilot of this directive allowed for 35% of the patients to have telemetry discontinued and was never discontinued in error.

Conclusions: Our pilot project showed a sustained decrease in the percentage of class III telemetry, and our medical directive pilot was effective without any documented adverse events.

Authors: Meherzad Kutky PGY5 Nephrology
Supervisor: Dr. S. Yohanna

4 - O Sex Differences and Health Disparity Among Hepatitis C Positive Patients Receiving Pharmacotherapy for Opioid Use Disorder: Findings from a Propensity Matched Analysis

Background: The incidence of opioid-related fatality has reached unparalleled levels across North America. Patients with comorbid hepatitis c virus (HCV) remain the most vulnerable and difficult to treat. Considering the unique challenges associated with this population, we aimed to re-examine the impact of HCV on response to medication assistant treatment for opioid use disorder as well as establish sexspecific risk factors affecting care.

Methods: This study employs a multi-center prospective cohort design, with one-year follow-up. Patients aged > 18, receiving methadone for opioid use disorder were recruited from a network of out-patient opioid addiction treatment centers across Southern Ontario, Canada. Patients with ≥ 50% positive opioid urine screens over one year of follow-up were classified as poor responders. The prognostic impact of HCV on response was established using a propensity score matched analysis. Sex-specific regression models were constructed to evaluate risk factors for treatment response.

Results: Among participants eligible for inclusion (n=1234), HCV was prevalent in 25% (n=307). HCV patients exhibited significantly higher rates of dangerous opioid consumption patterns 35.29% (SD 0.478). Sex-specific examination revealed females with HCV incur a 3 times increased risk for dangerous opioid consumption behaviors (female OR: 2.78, 95% CI 1.09, 7.05; p=0.032).

Conclusion: Findings from this study establish the link between HCV and poor treatment response, with differentially higher risk among female patients. In light of the high potential for overdose among this population, concerted efforts are required for distinguishing the source for sex-based disparities, in addition to establishing trauma and gender informed treatment protocols.

Author: Brittany Dennis PGY2
Supervisors: Dr. Z. Samaan

5 - O In Situ Simulation for Rapid Institution-Wide Implementation of a Protected Code Blue During an Active Pandemic

The Covid-19 pandemic has called for rapid transformation of institutional protocols to prevent viral transmission, protect healthcare workers, and preserve resources. In particular, code blue situations were high risk for aerosolization and potential PPE breaches, requiring immediate adaptation during the first wave. Our quality improvement initiative used in situ simulation (ISS) to design and implement the new protected code blue protocol at St. Joseph's Hospital.

A code blue policy was developed, informed by American Heart Association, Heart and Stroke Foundation and Ontario Public Health Guidelines. We recognized that implementation of the protected code blue policy and judicious use of PPE would be very challenging. The initiative was thus designed to utilize ISS to train physicians, nurses and respiratory therapists across various clinical units in the hospital, and to detect the latent safety threats (LSTs) that would hinder safe implementation of the policy. Iterative PDSA (Plan-Design- Study-Act) cycles were designed and actualized, and at each stage the LSTs were identified and mitigated in the following domains: knowledge, personnel and staff, process, policy, systems issues, and medications.

Over 80 simulations were completed from March to June 2020. LSTs such as effective communication, appropriate PPE use, overcrowding, intubation procedure and safety lead roles were identified and mitigated through policy changes, training and retesting. The simulations received good feedback and resulted in increased compliance with the protected code blue policy. No Covid-19 outbreaks were traced to the simulations or to actual protected code blues.

In situ simulation is an effective QI modality, especially when rapid training is required and real-world threats must be identified and mitigated in a timely manner to optimize both patient and healthcare worker safety.

Authors: Candice Griffin PGY3
Supervisors: Dr. Z. Khalid

6 - O Predictors of ILD development and timing of onset in systemic sclerosis: A Canadian cohort

Background: Systemic sclerosis (SSc) is a connective tissue disease characterized by immune dysfunction causing vasculopathy, inflammation and fibrosis of multiple organs. Lung involvement, characterized by interstitial lung disease (SSc-ILD) and pulmonary hypertension, affect 50-70% percent of patients and together are the leading cause of death. Survival after SSc-ILD diagnosis averages 78 months therefore identifying those at highest risk for SSc-ILD is pertinent to optimizing care. The purpose of this study was to identify predictors of SSc-ILD and its early (before 5 years) versus late onset with a view to developing a future prediction rule to aid in optimizing screening for SSc-ILD.

Methods: We performed a retrospective review of the Canadian Scleroderma Research Group patient registry. All patients 18 years or older were included in the analysis. Ordinary least squares and forward stepwise regressions with Bonferonni correction were used to determine predictors of both ILD diagnosis and early onset.

Results: 1505 patients were included, of which 227 developed SSc-ILD. Development of SSc-ILD was associated with increased in mortality (OR 1.74 [1.44, 2.10; 95% CI]). We identified 14 factors associated with increased odds of developing SSc-ILD independent of age and sex. Additionally, our forward selection model revealed 6 independent and significant predictors of SSc-ILD including baseline DLCO, anti-centromere-antibody, baseline FVC, anti-topoisomerase-antibody, hemoglobin and age at Raynaud's onset. Age at SSc diagnosis was the only predictor of development of early SSc-ILD.

Conclusion: In a large Canadian cohort we confirmed that development of SSc-ILD significantly increases the risk of mortality in patients with SSc. Six factors were significantly and independently associated with a greater risk of developing ILD, and age was the main predictor of earlier versus later onset.

Authors: Jessica Kapralik PGY5 Respirology
Supervisors: Dr. N. Hambly

7 - O Exploring Trauma in Medical Training: The Impact of Patient Death during Residency

Introduction: Patient death is an inevitability of medical training. Subsequent distress, decreased empathy, and worse learning outcomes have been reported amongst physicians. While debriefing provides space for reflection, this infrequently occurs. Early trainees often feel underprepared to manage death. We aimed to ascertain the impacts of patient death, debriefing opportunities, and coping strategies employed by residents at McMaster University.

Methods: Trainees across residency programs that completed an internal medicine rotation at McMaster were invited to participate. Semi-structured interviews were conducted to understand circumstances, emotional responses, support, coping mechanisms, and preparedness regarding the patient death. Interviews were transcribed and coded to identify themes using thematic analysis and constructivist grounded theory.

Results: At the time of submission, 13 interviews were completed and 18 participants recruited. Three main themes were categorized: 1-patient death circumstances; 2-personal and professional impact; 3-trainee support. Pronouncing death, communicating with families, and unexpected/unknown deaths were common challenges. Feelings of guilt, helplessness, regret and grief often followed events, amplified by lack of debriefs. Perceived medical culture, power imbalances, and fear of appearing unprofessional contributed to emotional consequences including difficulties sleeping, intrusive thoughts, and emotional distancing. Respondents universally felt underprepared for the experience. Some residents were aware of formal supports, although none accessed these services. While these experiences are congruent with effects of psychological trauma, they were consistently normalized by trainees.

Conclusion: Patient death in medical training can be traumatic for trainees and may perpetuate loss of empathy, changes to practice, and residual emotional effects. These experiences are normalized by medical culture, and residents themselves. Further focus is needed to better prepare trainees for this phenomenon and examine the culture in which physicians operate.

Authors: Wendy Ye PGY2, Candice Griffin PGY3
Supervisor: Dr. D. Brandt Vegas

8 - O Maintenance therapy in transplant ineligible adults with newly-diagnosed multiple myeloma: A systematic review and meta-analysis

Multiple myeloma (MM) is an incurable malignancy characterized by clonal proliferation of plasma cells. Treatment consists of induction therapy, consolidation with autologous stem cell transplantation for eligible patients, followed by maintenance therapy. The role of maintenance therapy in the transplant-eligible population is well established; however, its role in transplant-ineligible MM patients is less clear.

We conducted a systematic review and meta-analysis of all RCTs examining maintenance therapy versus observation in newly diagnosed transplant-ineligible MM patients to assess efficacy and toxicity.

We performed a comprehensive search of MEDLINE, Embase, and Cochrane database up to February 28, 2020. Two authors screened studies for eligibility, extracted data, and assessed risk of bias. The outcomes of interest included progression free survival (PFS), overall survival (OS), and adverse events. We performed meta-analyses using a random effects model and assessed certainty using GRADE methodology.

5 RCTs with a total of 1139 patients were included in the meta-analysis. Patients receiving maintenance therapy vs observation had improved PFS (Hazard ratio [HR] 0.48, 95% confidence interval [CI] 0.38-0.62, high certainty). There was no difference in OS (HR 0.96, 95% CI 0.76 to 1.2, moderate certainty). Patients receiving maintenance therapy had higher rates of hematologic adverse events (RR 3.67, 95% CI 1.51-8.93, low certainty), infections (RR 2.21, 95% CI 0.61-8.0, very low certainty), and second primary malignancies (RR 1.46, 95% CI 1.04-2.04, moderate certainty).

In conclusion, this systematic review and meta-analysis demonstrates that, in newly diagnosed transplant-ineligible patients, maintenance therapy improves PFS; however, higher toxicity rates were also observed. While maintenance therapy may present a therapeutic option for this population, additional studies are required to identify patients who would benefit the most from this approach.

Authors: Aram Karkar PGY2
Supervisor: Dr. H. Mian

Poster Presentations

Scientific

1 – 23

1 - S Azathioprine Compared to Mycophenolate Mofetil Treatment in Patients with Interstitial Lung Disease Associated with Systemic Sclerosis

Background: Systemic Sclerosis associated Interstitial Lung Disease (SSc-ILD) is one of the leading causes of mortality in SSc. Early initiation of disease-modifying medications to reduce the risk of progressive lung deterioration is a cornerstone of therapy. Many drugs have been studied in patients with SSc-ILD but mycophenolate mofetil (MMF) and azathioprine (AZA) have never been directly compared.

The aim of this project is to compare outcomes in patients with SSc-ILD treated with MMF and AZA.

Methods: Data from the Canadian Scleroderma Research Group Database was used to identify adult patients with SSc-ILD. Of the 1700 patients, 233 had SSc-ILD. Age, sex, time since SSc diagnosis, co-existing pulmonary hypertension, 5-year mortality and 10-year mortality were analysed.

Results: For the 233 patients identified, 108 were treated with either MMF or AZA. Patients were predominantly female (81%). Age, baseline predicted FVC%, baseline predicted DLCO% and co-existing pulmonary hypertension were similar between groups. Patients treated with AZA had treatment started closer to the time of their ILD diagnosis than those treated with MMF (0.87 years vs 1.74 years, p = 0.05).

When comparing those patients treated with MMF and AZA there was no significant difference in mortality at 5 -or 10-years post treatment initiation. At 5 years, 9 (14.1%) of patients treated with MMF and 7 (15.9%) treated with AZA had passed away (p =0.79) and at 10 years, it was 17.2% and 29.5% respectively (p = 0.13). Similarly, there was no significant difference in change in pulmonary function over time.

Conclusions: Our results suggest in SSc-ILD there is no significant difference in survival or change in lung function when comparing groups treated with MMF or AZA.

Authors: Jaymee Shell PGY2
Supervisors: Dr. N. Hambly

2 - S Piloting 'Virtual Ward': A Novel Platform for Delivering Medical Student Education by Residents

Background: Clinical experiences lie at the heart of undergraduate medical education. COVID-19 related disruptions in Medical Education have impacted medical students substantially. As educators some of our efforts should be directed at developing new mediums to educate our medical students in the face of these new limitations. The Virtual Ward (VW) Pilot was a resident-driven inaugural virtual educational opportunity that aimed to supplement the learning of core internal medicine skills for undergraduate medical students.

Methods: Interested medical students were paired in groups of 5-6 with an internal medicine resident tutor (PGY1-3). We designed a template Powerpoint presentation and generated a list of core internal medicine topics for residents to teach in an open, morning-report format. Following completion, the VW series, we distributed an online anonymous survey using a 5-point Likert scale to participants.

Results: In total, 166 medical students and 27 internal medicine resident tutors participated in the VW Pilot. In total 46 (28%) of medical students responded to the survey. 96% of survey respondents rated the sessions as being helpful to their learning. The majority rated VW superior to existing learning modalities. 94% thought VW should continue after COVID-related restrictions abate.

Conclusions: Virtual Ward is a novel educational platform that was very well received by learners. We propose VW may have a continued supplemental role post-pandemic to help with translation of knowledge to clinical skills and provide an additional avenue of mentorship for students.

Authors: Coralea Kappel PGY2, Waseem Hijazi PGY3
Supervisors: Dr. N. Singhal

3 - S The association between socioeconomic status, sex, race and in-hospital mortality among patients hospitalized for heart failure

Background: Hospitalization for heart failure (HF) is high risk, and outcomes may be influenced by socioeconomic determinants.

Methods: We analyzed HF hospitalizations in the United States National Inpatient Sample between 2015-2017. Using a multivariable regression model, we assessed the association between SES, sex, and race and in-hospital mortality. We estimated the direct costs (USD) across SES groups.

Results: Of 4,287,478 HF discharges, 48.7% were female, 70.0% were White, and 33.1% were low SES. Male sex (RR 1.09, 95% CI 1.07-1.11) and low SES (RR 1.02, 95% CI 1.00-1.04) were associated with increased risk; whilst Black (RR 0.78, 95% CI 0.75-0.80) and Hispanic race (RR 0.89, 95% CI 0.86-0.93) were associated with reduced risk of in-hospital mortality versus White race. There was a significant interaction between SES and race ($p<0.01$). Racial differences in outcome were more pronounced in low SES groups (RR 0.75, 95% CI 0.71-0.78 vs RR 0.81, 95% CI 0.76-0.86 for low vs high SES Black patients; and RR 0.88, 95% CI 0.83-0.94 vs RR 0.94, 95% CI 0.88-1.00 for low vs high SES Hispanic patients). The median cost of admission was lower in low vs high SES ($9324.60 vs $10940.40)and Black vs White patients ($9077.20 vs $10019.80).

Conclusions: SES is associated with in-hospital mortality during HF hospitalization. The lower costs and risk of in-hospital mortality among Black patients suggests that Black patients may be hospitalized at a lower threshold of risk or that higher-risk Black patients are not hospitalized. The role of systemic barriers should be investigated.

Authors: Tauben Averbuch PGY2
Supervisor: Dr. H. Van Spall

4 - S Handover of Care: A Novel Interprofessional Workshop for Junior Learners

Introduction: Interprofessional handover is crucial for patient safety, and structured tools and effective interprofessional communication skills improve handover delivery. Simulation-based interventions may help improve interprofessional handover readiness among trainees. In this study, we describe a novel simulation-based interprofessional handover workshop for undergraduate healthcare trainees, delivered both in-person and virtually.

Methods: Medical and nursing students attended either a virtual or in-person session of a 2-hour simulation-based handover workshop. Students received brief didactic instruction on the SBAR (situation, background, assessment, recommendation) handover tool, then rotated through four stations in interprofessional groups, followed by a facilitator-led debrief. Workshop content was consistent between virtual and in-person sessions. Objectives on interprofessional communication, conflict resolution and role clarification were integrated. Students were asked to rate satisfaction, and their pre and post-workshop perceived level of comfort participating in interprofessional handover.

Results: Eighteen medical (1st and 2nd year) and twelve nursing students (2nd to 4th year) attended in-person sessions of the handover workshop. Six medical and four nursing students attended a virtual pilot session. In-person participants' self-reported confidence participating in interprofessional handover increased from 1.8 to 4.1 on a 5-point scale ($p = 0.019$). Virtual participants' self-reported confidence participating in interprofessional handover increased from 1.7 to 4.4 on a 5-point scale ($p < 0.0001$). Satisfaction scores were similar ($p=0.5$) for in-person (4.6 on a 5-point scale) and virtual workshops (4.5 on a 5-point scale). A majority of students identified the opportunity for interprofessional feedback on communication skills as helpful.

Conclusion: A brief simulation-based SBAR-structured workshop improved perceived level of comfort with interprofessional handover among junior learners. Preliminary data suggests that a virtual alternative may be effective and acceptable to learners.

Authors: Arden Azim PGY2
Supervisor: Dr. M. Sibbald

5 - S Association of Appendectomy with Development of Ulcerative Colitis: A Systematic Review and Meta-Analysis

Background and Aim: Numerous studies have explored the association of appendectomy with the development of ulcerative colitis (UC) with conflicting results. We performed a systematic review and meta-analysis to further evaluate this relationship.

Methods: A systematic literature search and a review of reference lists from previously published articles was performed to identify appropriate studies. Our primary endpoint was the diagnosis of UC following an appendectomy. Odds ratios (OR) with 95% confidence intervals (CI) are reported.

Results: Fifty-one studies (49 case-controls studies and 2 cohort studies) were included with a total of 515,149 participants. Appendectomy was associated with a decrease in odds of developing UC (OR 0.37, 95% CI, 0.29-0.47, I2 = 87%). A similar pattern was seen for individuals who received an appendectomy before the age of 20 (OR 0.36, 95% CI, 0.16-0.56, I2 = 77%). A sensitivity analysis with only high-quality methodological studies demonstrated similar results (OR 0.47, 95% CI 0.34-0.65, I2 = 56%).

Conclusion: Appendectomy is associated with decreased odds of subsequent development of UC. Future research should focus on the physiological explanation behind this association, collection of prospective data, and the consideration of using appendectomy for primary prevention in patients at high-risk of developing UC.

Authors: Daniyal Abdali PGY2
Supervisor: Dr. N. Narula

6 - S A Systematic Review of Academic Bullying in Medical Settings: Behaviours, Perpetrators, Victims and Consequences

Purpose: To characterize the dynamics and consequences of bullying in academic medical settings.

Design: Systematic review.

Data sources: We searched EMBASE and PsycINFO for articles published between January 1, 1999 and June 24, 2018.

Study selection: We included studies conducted in academic medical settings in which victims were either consultants or trainees, and described bullying behaviours; the perpetrators or victims; the impact, and/or interventions. Study characteristics, quality, and data were assessed independently by 2 reviewers.

Results: We included 44 studies representing 36,262 consultants and trainees. We defined academic bullying as the abuse of authority in an academic setting through punishing behaviours that include overwork, destabilization, and isolation. Of 25,639 individuals (in 19 studies) who responded about bullying patterns, the most common (38.2% of respondents) was overwork. Of 9,181 individuals (20 studies) who reported the impact, the most common was psychologic distress (40.4%). Among bullies identified by 11,006 individuals (16 studies), consultants (55.1%) were most common. Of 6,923 victims who reported gender (17 studies), the majority were women (52.3%). Among 6,930 victims (in 15 studies) who described their response, 32.8% filed a report and most (52.3%) did not perceive a positive outcome. Studies that tested the effect of interventions to mitigate bullying had high risk of bias.

Conclusions: Academic bullying commonly involves overwork, and is perceived as having a negative impact on well-being. Perpetrators were commonly male consultants and victims were commonly women. Only a minority of victims filed a report. Methodologically robust trials of anti-bullying interventions are needed.

Authors: Tauben Averbuch PGY2
Supervisors: Dr. H. Van Spall

7 - S Navigating Challenges in Entrustable Professional Activity Completion in Internal Medicine: A QI Project in Medical Education

Introduction: As IM programs make the transition to competency-based medical education (CBME), continuous evaluation of the EPA process is imperative. The goal of this project is to identify challenges in CBME implementation, and to optimize education on the clinical teaching unit (CTU) at McMaster.

Method: 77 residents at McMaster IM have transitioned to CBME. QI methodology was used to identify areas of improvement. A root cause analysis identified barriers including lack of knowledge on EPA opportunities, EPAs expiring, and lack of time. 46% of residents stated posters can potentially improve knowledge on EPA opportunities. A poster was designed outlining EPAs that can be completed on CTU. We measured self-reported EPA completion and opportunity awareness through surveys using a Likert scale. We hoped to improve the number of EPAs triggered in 2 blocks by 25%.

Results: 47% of respondents noticed the posters, and 86% stated they were easy to understand. However, there was no self-reported increase in the number of triggered EPAs, and residents continue to cite similar barriers to completion. 84% of residents stated the posters did not help them identify more EPAs to complete. 0% of respondents reported using the posters to direct evaluators to potential EPAs.

Conclusion: Posters were not an effective intervention to improve knowledge or completion of EPAs. This highlights the importance of iterative exploration and re-sampling of residents in order to develop solutions. Based on repeat survey results, our group developed a two-pronged approach of lanyard cards and buttons to increase awareness of EPA opportunities, which will be evaluated in the next survey cycle.

Authors: Wendy Ye PGY2, Jaymee Shell PGY2, Rishi Sharma PGY1, Aram Karkar PGY2, MacKenzie Turpin PGY2
Supervisors: Dr. L. Martin

8 - S Knowledge Translation: Revamping Internal Medicine Resident-Led Academic Clinical Rounds at McMaster University

Background: Medical rounds, whether it's grand medical rounds or resident-led, have been an educational activity and time-honored tradition that provides an opportunity for learners to gain valuable knowledge. Senior Medicine Residents at McMaster are required to create an Advanced clinical rounds (ACR) presentation that answers a clinical question using up-to-date evidence. Over time the relevance, attendance, completion and effectiveness for ACR has been questioned locally. The objective of this study is to implement interventions based on a needs assessment to improve the relevance, attendance and learning for ACR at McMaster University.

Methods: Pre-implementation/needs assessment was done by engaging relevant stakeholders (Clinical Teaching Unit Directors, Program Director, Faculty, and Residents) to help develop themes for improvement. These themes helped guide interventions for implementation. Interventions were formally implemented using the validated Canadian Institute of Health Research's Knowledge-to-Action framework. A pilot implementation was done for 3 months.

Results: Pre-implementation showed similar themes amongst members of the focus group. Lack of organization, clear guidelines, advertisement and topic relevance were themes identified. Implementations included constructing new guidelines, central scheduling system, topic approval requirements, advertisement and food incentive. Pilot implementation was done over 3 months across 3 sites for 2 cycles (July 2020-Sept 2020). Main barriers to implementation were the COVID-19 pandemic and rotating Chief Resident role. Program administrators, resident buy-in, chief medical residents, and online streaming technology were seen as common facilitators to implementation.

Conclusions: This study presents a logical process for assessment and widespread implementation of strategies to improve clinical rounds. It addresses common barriers and facilitators in the implementation process. Lastly it provides solutions to barriers that may be encountered in future implementation at other academic centers.

Authors: Tamoor Afzaal PGY2
Supervisor: Dr. M. Panju

9 - S Self-reported transition readiness of adolescent patients with rheumatologic disease: Do the parents agree?

Background: The transition from pediatric to adult rheumatology care is associated with increased morbidity and disease activity. Assessing both adolescents' and parents' perception of the adolescent's independence/self-management skills are important to identifying discordant views and developing strategies to improve transition. Thus, we compared the transition readiness assessments from both perspectives and determined their level of agreement.

Methods: Adolescents 14-18 years old with juvenile idiopathic arthritis or juvenile systemic lupus erythematosus and their parents were recruited in the McMaster Rheumatology Transition Clinic and both independently completed the TRANSITION-Q during clinic appointments. The TRANSITION-Q is a 14-item validated, self-administered questionnaire assessing healthcare self-management skills where higher scores (max 100) indicate greater transition readiness. Total scores and frequencies of responses to each question ("never", "sometimes" or "always") were determined. Correlation of total transition scores of parents and adolescents, and the proportion of agreement between their responses, were determined.

Results: Among 54 patient/parent dyads, the correlation between parents' and adolescents' total scores was 0.54 ($p<0.05$). For each question, dyads agreed 68% of the time. The majority of disagreement was by one factor (e.g. sometimes/always). Most frequent disagreements pertained to adolescents' discussion with people about their health condition and asking questions regarding their health. Extreme disagreements (e.g. always/never) occurred 9% of the time regarding whether adolescents contact the doctor when they need to, and seeing the doctor/nurse on their own.

Conclusions: Adolescents and parents generally agree on the level of the adolescent's transition readiness, however there is occasional disagreement in specific domains. Identifying items more prone to disagreement can help identify areas to target future interventions to improve successful transition to adult care.

Authors: Christina Ma PGY1
Supervisor: Dr. K. Beattie

10 - S Comparative Efficacy of Higher Adalimumab Maintenance Therapy vs Standard Dose in Anti-TNF Experienced Crohn's Disease Patients: A Propensity-Score Matched Cohort Analysis

Background: Patients with Crohn's disease (CD) who have previously failed anti-TNF therapy are at higher risk of treatment failure with subsequent biologic treatments. Objective: To determine the effectiveness and safety of higher maintenance dose regimens of adalimumab compared to standard doses in CD patients with prior anti-TNF failure.

Methods: In this retrospective observational study, CD patients with prior anti-TNF failure who received adalimumab were categorized according to their post-induction maintenance regimen; patients receiving 40mg subcutaneous (sc) weekly or 80mg sc every other week were defined as a high dose (HD) maintenance regimen and 40 mg sc every other week was defined as a standard dose (SD) maintenance regimen. The primary outcome was time to treatment failure. Cox proportional hazards regression was used to adjust for confounders. Sensitivity analysis was conducted using propensity scores to create a cohort of matched participants with similar distribution of baseline co-variates.

Results: There were 40 patients started on HD regimens following induction and 77 patients received the SD regimen. The median time to failure in the HD group was 6.6 years (Inter-quartile range (IQR) 4.0, 9.6), and was 3.0 years (IQR 0.9, 9.4) in the SD group (log-rank test p=0.006). Patients on HD adalimumab had a lower hazard rate of treatment failure (HR 0.27; 95% CI [0.12, 0.62]; p = 0.002) when compared to patients on SD, after adjusting for concomitant immunomodulator use. No difference in adverse events was identified between the groups (30% vs. 31.2%, p=1.0). Results were similar in the propensity score-matched cohort.

Conclusion: HD maintenance regimens were associated with longer time to treatment failure as compared to SD regimens in patients with CD and prior anti-TNF failure.

Authors: Hasan Bualbanat PGY2, Raed AlRamdan PGY2
Supervisor: Dr. N. Narula

11 - S Scleroderma Presentation in the Canadian Scleroderma Research Group Indigenous Population

Background: It is known that Rheumatoid Arthritis (RA) and Systemic Lupus Erythematosus have worse outcomes in North American Indigenous (NAI) populations compared to the general population. It has also been shown that, in RA, the Indigenous population is less likely to see a rheumatologist. Although studies suggest that NAI populations have earlier onset systemic sclerosis (SSc) than the general population, it is unclear if they experience a delay from symptom onset to disease diagnosis, and whether this results in different healthcare utilization. Therefore, we analyzed the Canadian Scleroderma Research Group (CSRG) registry data to determine whether the time to disease diagnosis differs between NAI and non-NAI populations, and whether there are differences in resource utilization during that time.

Methods: Data was obtained from the CSRG, a national registry of SSc patients. Patients self-identified as NAI. We characterized the population at registry entry (sex, tobacco use, income, education and comorbidities). The time from first symptom to diagnosis was calculated and compared between NAI and non-NAI populations. Resource utilization including visits to health practitioners, tests done, and hospitalizations was compared between the two groups.

Results: Of 1561 patients in the CSRG, 79 self-identified as NAI. Gender and comorbidities were similar between groups. There was no significant difference in symptom presentation or time to diagnosis between NAI and non-NAI populations. There was no difference in healthcare utilization, including visits to healthcare professionals, the type of professional, or tests performed.

Conclusion: This study demonstrates that SSc is being appropriately diagnosed without a time delay in the Indigenous population. Additionally, although the NAI SSc population has an earlier age of diagnosis, there is no increased burden on health services.

Authors: Curtis Sobchak PGY2
Supervisor: Dr. M. Larché

12 - S Investigation of Prevalence and Risk Factors for Gemcitabine-associated Pseudocellulitis

Background: Pseudocellulitis is a cutaneous reaction that can occur while on gemcitabine-based chemotherapy and mimics cellulitis. It can mislead clinicians towards unnecessary investigations and interventions at the cost of patient health. It is important to understand the incidence and associated risk factors amongst patients receiving gemcitabine-based chemotherapy.

Methods: Retrospective, single-centre cohort study involving patients receiving gemcitabine-based chemotherapy. Patients were included between February 2017 to February 2018 and followed through to March 2020. A total of 113 patient charts were initially screened for exposure to gemcitabine-based chemotherapy and 103 patients were included in the chart review. Outcomes included prevalence and incidence of pseudocellulitis. Logistic regression analysis was used to identify associated risk factors. A two-sample test for proportions was used to confirm pseudocellulitis association with nab-Paclitaxel therapy.

Results: Fifteen patients were identified to have pseudocellulitis among 103 included in the study. The incidence of pseudocellulitis was 3.54 per 1,000 person-years with a prevalence of 14.6%. All 15 pseudocellulitis patients (100%) received gemcitabine/nab-Paclitaxel therapy. Two-sample test of proportions confirmed a significant association of pseudocellulitis with presence of pancreatic cancer and use of gemcitabine/nab-Paclitaxel ($p < 0.00001$ for both). In the sub-group of 49 patients who received gemcitabine/nab-Paclitaxel, the incidence of pseudocellulitis quadrupled to 13.2 per 1,000 person-years. No additional risk factors, including cumulative gemcitabine dose, were found to be significantly associated with pseudocellulitis.

Conclusion and Relevance: This study of patients receiving gemcitabine-based chemotherapy identifies a higher prevalence of pseudocellulitis than previously suggested. Pseudocellulitis was exclusively identified in patients receiving gemcitabine/nab-Paclitaxel therapy. No additional risk factors were confirmed. This highlights the importance of pseudocellulitis awareness in patients receiving gemcitabine, particularly in combination with nab-Paclitaxel.

Authors: Stefan Jevtic PGY1
Supervisor: Dr. R. Yelanmanchili

13 - S Community Implementation of the 3 Wishes Program: An Observational Study of a Compassionate End-of-Life Care Initiative for Critically Ill Patients

Purpose: The Three Wishes Project promotes a personalized dying experience through eliciting and facilitating individualized terminal wishes for patients, families, and the clinicians caring for them. We aimed to evaluate the adaptability of the 3WP to a community intensive care unit (ICU), describing patients cared for with this palliative approach and local implementation strategies.

Methods: In a 15-bed community hospital ICU in Southern Ontario from 2017-2019, patients whose risk of death was deemed >95% by the attending physician, or patients undergoing life-support withdrawal were invited to participate. We abstracted patient data from medical records, the type, timing and cost of each wish, which person or service made and facilitated each wish, successful wish completion, and reasons why not. Data were summarized both narratively and statistically in this observational descriptive methods study.

Results: For 101 dying patients, the 3 Wishes Project helped to realize 99.2% of 483 terminal wishes. This initiative was introduced as an interprofessional intervention and championed by nursing staff, responsible for most patient enrolment and wish facilitation. Wishes included humanizing the ICU environment with belongings and blankets, musical performances, smudging and bathing ceremonies, and keepsakes. The cost was $5.39 per patient (SD $22.40), with 430 (89.8%) wishes incurring no cost. The program comforted patients and their loved ones, motivating clinicians to sustain this end-of-life intervention.

Conclusions We documented successful implementation of the 3 Wishes Project in a community hospital, demonstrating program adaptability and uptake outside academic centers at relatively low cost, underscoring the program's inherent flexibility to promote compassionate end-of-life care.

Authors: Brittany Dennis PGY2
Supervisor: Dr. D. Cook

14 - S Iron Supplementation Following Bariatric Surgery: A Systematic Review of Current Strategies

Introduction: Iron deficiency (ID) and iron deficiency anemia (IDA) are common following bariatric surgery. There are limited standardized treatment recommendations for the management of ID and IDA in the bariatric population. The purpose of this study was to review the current strategies for iron supplementation following bariatric surgery and assess their relative efficacy in managing ID and IDA.

Methods: MEDLINE, EMBASE, and Cochrane Central Register of Controlled Trials were searched to January 2021. Primary outcomes of interest were prevention or improvement in ID or IDA with iron supplementation. Secondary outcomes included change in other hematologic parameters and patient adherence to therapy. The Newcastle-Ottawa and Cochrane tools were used to assess risk of bias.

Results: 49 studies with 12880 patients were included. Most patients underwent Roux-en-Y Gastric Bypass (RYGB) (61.9%). Iron supplementation was most commonly administered orally for prevention of ID/IDA and was effective in 52% of studies. Both IV and oral iron were given for treatment of ID/IDA. 50% (3/6) of the oral and 100% (3/3) of the IV supplementation strategies were effective at treating iron deficiency. Barriers to adherence to oral iron were inconsistently reported but included nausea and GI intolerance.

Conclusion: Iron supplementation strategies employed following bariatric surgery are highly variable, and many do not provide sufficient iron to prevent the development of ID and IDA, potentially due to poor patient adherence. Further high-quality prospective trials, particularly comparing intravenous and oral iron, are warranted in order to determine the ideal dosage, route, and duration of iron supplementation.

Authors: Sama Anvari PGY1
Supervisor: Dr. A. Doumouras

15 - S Clinical indices of systemic autoimmunity do not predict sputum autoantibodies in patients with severe eosinophilic asthma: a prospective study

RATIONALE: A subset of corticosteroid-dependent severe eosinophilic asthmatics (SEA) has an autoimmune phenotype, defined by the presence of sputum autoantibodies against eosinophil peroxidase (EPX). Free eosinophil granules (FEGs) in sputum and sputum total cell count (TCC) are indicative of airway infection and reflect the presence of anti-EPX IgG in patients maintained on daily inhaled/oral corticosteroids. It is unclear whether systemic autoimmune disorders are a predictor of airway autoimmunity, which was examined prospectively in this study.

METHODS: 106 SEA subjects completed an autoimmune asthma questionnaire (AAQ) over the phone. The AAQ was designed to determine demographics, personal and family history of autoimmunity, and autoimmune-related symptoms. Patients were stratified as autoantibody + or – based off of previously established anti-EPX IgG cut-off threshold (positive ≥0.75 Abs600 units). Local airway and peripheral inflammatory markers, spirometry, and AAQ data were evaluated based on their local autoimmune status. Multiple regression model determined predictive factors of airway autoimmunity.

RESULTS: Patients positive for anti-EPX IgG had increased FEGs (P=0.01) and sputum TCC (P =0.001), compared to those without. FEV1/FVC negatively correlated with sputum anti-EPX antibody levels (r=0.51, P=0.002)., There was no difference in incidence of personal or family history of autoimmune disease between subgroups. Patients positive for anti-EPX IgG had a trend for increased reports of fatigue/malaise (P=0.05). None of the collected data of personal/family history, compiled symptoms (AAQ score; index) predicted the presence of sputum anti-EPX IgG.

CONCLUSIONS: The study demonstrates that personal and family history of autoimmunity, and autoimmune-related symptoms do not predict airway autoimmune responses in SEA. Localized autoimmune events demonstrated in asthmatic airways is not attributed to familial/systemic predispositions, but rather acquired due to uncontrolled airway inflammation.

Authors: Brittany Salter PGY1
Supervisor: Dr. M. Mukherjee

16 - S Immune Phenotyping of SARS-CoV-2 Infection in Pregnant Women Admitted for Delivery in Hamilton, Ontario

Background: During the ongoing COVID19 pandemic we have begun recruiting a cohort of obstetric patients to study the immunology of COVID19 infection and vaccination in pregnant women.

Methods: Demographic information including risk factors, COVID19 vaccination status, prior infection and severity are collected by questionnaire. Enrolled patients have peripheral blood samples collected at the time of admission for delivery. After delivery, matched umbilical cords blood samples are collected. Peripheral and umbilical cord blood samples are analyzed using flow cytometry to enumerate and characterize subpopulations of immune cells (T cells, B cells, NK cells, macrophages and dendritic cells, neutrophils and hematopoietic progenitors). Specific cells of interest include T cell subsets, including CD4, CD8, regulatory T cells, and Th1/Th2/Th17 populations. Collected plasma has been frozen for planned studies to characterize plasma cytokine levels with COVID infection and serologic status to identify markers of prior infection or vaccination.

Results: To date, 20 patients have been enrolled in the study, including five patients who have had positive cases of COVID during their pregnancy. Several of these positive cases are due to deliver by June 2021. Preliminary results from the initially cohort of COVID negative patients have validated our analyses. Enrollment of positive cases with matched negative controls is ongoing.

Conclusions: By identifying and characterizing the immune response to COVID19 in pregnant women we hope to develop a better understanding of the immune mediators of protective immunity to better inform management of COVID-19 in pregnancy and in general. Understanding protective immunity is essential to inform vaccination practice and strategies to counsel pregnant women during the ongoing COVID pandemic.

Authors: David Putman PGY3
Supervisor: Dr. J. Denburg

17 - S Describing Wait Times Associated with Access to Geriatric Medicine Consultation in the Outpatient Setting in Ontario, Canada

Background: Wait times are an important measure of access to specialist care and if prolonged, can have negative outcomes for older adults. There is no published data describing wait times for access to Geriatric Medicine in the outpatient setting. It is imperative to describe these wait times to determine what the current access to care for older adults is. Furthermore, descriptive studies such as this can be useful for provincial and local policy makers as they work to address access to specialist care for this vulnerable group of individuals.

Methods: Survey sent to regional coordinators/leads from all Regional Geriatric Programs (RGP) and Specialized Geriatric Services (SGS) in Ontario.

Results: 6/11 (54%) RGP/SGSs responded to the survey. Average wait time to access Geriatric Medicine consultation for a non-urgent referral was 4.7 months (SD 1.9), compared to 3.6 months (SD 2.5) prior to the COVID-19 pandemic. Average wait time to access Geriatric Medicine Consultation for urgent assessment was 1.6 months (SD 1.2), there was no change prior to the COVID-19 pandemic. All respondents identified patient factors as impacting wait times (e.g., rescheduling, lack of availability). Other identified themes included location of specialist, and specialist factors (e.g., language spoken, area of expertise). Barriers identified in reporting and monitoring wait times included non-integrated reporting systems requiring manual data entering and recording, as well as resources needed for manual input.

Conclusions: Current wait times are documented. No consistent system exists for monitoring and reporting wait times. Wait times vary depending on urgency of referral. Moving forward, program development should focus on creating systems for tracking and reporting wait times which automatically interface with current EMR systems throughout a region.

Authors: Paula Pop PGY5 Geriatric Medicine
Supervisor: Dr. S. Marr

18 - S Management, Timing of Anticoagulation and Outcomes of Patients with Cerebral Venous Sinus Thrombosis: A Single Centre Chart Review

Background: Cerebral venous sinus thrombosis (CVST) accounts for <1% of all strokes. Prior studies have demonstrated that anticoagulation in CVST is safe and reduces adverse events. The aim of the study was to describe the clinical features and examine the association between the time of anticoagulation therapy and clinical outcomes of CVST patients.

Methods: Using ICD codes, we conducted a retrospective chart review of patients admitted to Hamilton Health Sciences (HHS) from 2015 to 2020 with imaging confirmed CVST.

Results: We included 96 patients (57 females; 39 males), mean age of 47.9 (SD 18.1). The most common clinical presentation was headache (43.8%). Brain trauma was the most common identified risk factor (15.6%), followed by oral contraceptive use (8.3%) and infection (8.3%). A cause was not identified in 27% of individuals. Most patients (57.3%) received full dose anticoagulation within 24hrs of identified CVST, while 26% of patients had a delay in anticoagulation (>48hrs) and 16.7% of patients did not receive anticoagulation. The reasons for delaying or not starting anticoagulation included traumatic brain injury (31.8%), post-op from neurosurgery (9.1%), presence of venous infarct and/or haemorrhage (27.1%) and unclear rationale (31.8%). At a median of 8 days, there was greater disability (defined as modified Rankin Scale, mRS, score > 2) and mortality (mRS 6) when anticoagulation was delayed or not initiated, compared to those who received anticoagulation within 24hrs (72% versus 40%). At a median follow-up of 12 months, the recurrence rate for CVST was 2.5%, while bleeding complications during anticoagulation therapy was 6.3%.

Conclusion: Our findings raise the issue that unjustified delay in anticoagulation may result in poorer clinical outcomes in patients with CVST.

Authors: Gloria Mak PGY3 Neurology
Supervisor: Dr. K. Perera

19 - S Factors Influencing HINTS Exam Usage in the Emergency Room

Background: The HINTS exam (head impulse, nystagmus, test of skew) is a sensitive and specific tool for determining whether a patient presenting with ongoing vertigo has had a stroke. Despite its efficacy, it is often not used by ER physicians when assessing patients who present with vertigo.

Methods: In order to ascertain why, we have sent out an email survey to ER physicians registered with the Canadian Association of Emergency Physicians (CAEP), using a modified Dillman technique. This survey gathered demographic information on ER physicians, their practices when assessing patients with vertigo, and inquired about their beliefs concerning the HINTS exam.

Results: 185 participants responded to our survey, predominately male, and relatively evenly divided amongst age groups, practice settings, and residency training pathways. The majority (82%) stated they regularly use the HINTS exam in the appropriate setting, but significant minorities (32-44%) used the exam in various inappropriate settings, such as without nystagmus, with the presence of concomitant neurological findings, and alongside tests for intermittent vertigo.

Conclusion: Lack of use, or misapplication, of the HINTS exam, was significantly associated with older age, years of practice, non-academic practice settings, and lack of five-year Emergency Medicine residency training ($p<0.05$). Among those who do not consistently use the HINTS exam, the predominant reasons appear to be lack of confidence in recalling and carrying out the component exam techniques, particularly the head-impulse test, as well as concerns about the safety and comfort of the head-impulse test, and the validity of the HINTS exam in an ER setting. Training on the HINTS exam should take into account these risk factors, specific gaps in education, and beliefs, in order to increase uptake.

Authors: Miles Byworth PGY4 Neurology
Supervisor: Dr. M. Sharma

20 - S Impact of Routine Echocardiogram Ordering in TIA and Stroke Patients on Length of Hospital Stay

Introduction: Transthoracic echocardiogram (TTE) is part of the work-up of transient ischemic attack (TIA) and ischemic stroke (IS), however the diagnostic yield of TTE is low. We aimed to determine whether TTE ordering in these patients is associated with prolonged length of hospital stay (LOS) as a potential drawback of this routine practice.

Methods: We completed a chart review of patients admitted consecutively to Hamilton General Hospital (Ontario, Canada) with a diagnosis of IS or TIA between 2016 and 2017. We assessed the LOS of those who had TTE versus those who did not, as well as the timing of TTE in relation to discharge. Of 520 charts reviewed, 262 of these patients were ultimately included based on a discharge diagnosis of TIA or IS and absence of other factors clearly prolonging LOS.

Results: A comparison across TIA and IS groups revealed a significant difference in LOS based on whether patients received a TTE; this was driven by patients with IS receiving a TTE, who had a mean LOS that was about 2 days longer than IS patients who did not receive a TTE (1.99 d, 95% CI 0.90-3.07, $p < 0.001$). 28.9% of IS patients completed TTE on their day of discharge and 46.97% of IS patients were discharged more than 48 hours after their TTE was completed.

Conclusions: These findings suggest that TTE ordering is associated with prolonged LOS in TIA and IS patients, however in many cases there are other factors prolonging LOS.

Authors: Michael DeDominicis PGY2 Neurology
Supervisor: Dr. S. Perera

21 - S Radiological Validation of a Novel MRI Reporting System for Axial Spondyloarthritis

Background: The MRI assessment of axial spondyloarthritis (SpA) is challenging. Often, bone marrow edema (BME) alone, rather than a global assessment, is mistakenly used to arrive at an imaging diagnosis. Given this, in 2019 our group proposed a novel categorization system for MRI reporting of the sacroiliac joints (SIJs) (O'Neill, et al., 2019) to standardize communication, remind physicians that BME alone does not constitute a diagnosis of SpA, and allow for uncertainty. This study aims to validate this system.

Methods: In this retrospective review, we identified 94 patients ≥18 years old, who had spondylitis MRI protocols ordered for suspected SpA from 2012-2018. Two rheumatologists retrospectively applied the categorization system to the original MRI reports. Two MSK radiologists, blinded to initial imaging diagnosis, completed a separate reading of the MRI images to generate a new report based on this system. A comparative assessment of the two reports was performed.

Results: Utilizing the new system for the SIJs alone, 51.1% (47/92) of patients were recategorized into new categories. Interestingly, when spinal imaging was added to the reading of the SIJs, only 6/94 cases changed categories. Further, spinal imaging added to the confidence of imaging diagnosis in only 4.3% (4/94). Disagreement between radiologists in their categorization was 19.1% (18/94), the majority of which were minor (13/18).

Discussion: We present a new MRI categorization system for axial SpA. There were many changes in the categorization categories of patients between the original and new MRI reports. We also found that adding whole spine imaging to the SIJ MRI added little in assessing for sacroiliitis but did help with alternate diagnoses. Further data analysis will help further delineate these findings.

Authors: Sandeep Dhillon PGY5 Rheumatology
Supervisor: Drs. J. O'Neill & R. Carmona

22 - S Race-Based Data Collection Among COVID-19 Inpatients: A Retrospective Chart Review

Background: Data from Ontario Public Health units demonstrate racial disparities in rates of COVID-19 morbidity and mortality. However, public health data are limited among patients hospitalized with COVID-19, prompting the question: are hospitals collecting sufficient data to study racial health disparities among inpatients?

Methods: We conducted a retrospective cohort study exploring race-based data collection among patients admitted with or without COVID-19 to one Ontario tertiary centre between March and October 2020. The COVID-19 group included inpatients admitted for any reason with a concurrent diagnosis of COVID-19, while the reference group included a random sample of inpatients admitted to General Medicine without COVID-19. Two data abstractors reviewed charts for assessments of race and ethnicity. Our primary endpoint was the percentage of inpatients with a formal selection for ethnicity recorded in the "Demographics" section of their electronic medical record. We also recorded informal assessments described in chart notes.

Results: We reviewed 80 patients with COVID-19 and 80 patients without COVID-19 (median age 69-74 years, sex ratio 1 in each group). A pilot chart review conducted in duplicate demonstrated good inter-rater reliability for the primary endpoint (Cohen's kappa 1). Formal ethnicity selections were recorded among 43.75% of the COVID-19 group and 48.75% of the reference group. The majority of these selections indicated Caucasian ethnicity (80% COVID-19 group, 87% reference group). Among patients with both formal and informal selections for race or ethnicity, only 40% had concordance between their formal and informal selections.

Conclusion: Collection of race and ethnicity data was less than 50% among inpatients with and without COVID-19 in one Ontario hospital. Adequate data collection is necessary to study racial health disparities in the hospital setting.

Authors: Clara Lu PGY4 General Internal Medicine
Supervisor: Dr. M. Verhovsek

23 - S Transgender Patients in the Rheumatology Setting

Background: Minimal medical research exists regarding transgender patients in rheumatology. A few case reports note medical transitions with exogenous estrogen may precede presentation of autoimmune diseases.

Methods: We conducted a retrospective chart review of transgender patients who presented to our clinics, and inpatient rheumatology service. We collected information on patients' medical history and rheumatologic diagnoses, transition, and treatment.

Results: From 25 rheumatologists contacted, 12 transgender patients were identified. Patients' ages ranged from 22-66 years old and had the following diagnoses: PsA, seronegative SpA, PM with SSc overlap, SSc, PMR, FM, leucocytoclastic vasculitis, periodic fever syndrome and osteopenia. Nine patients were transgender males, 8 were treated with intramuscular testosterone and 2 had hysterectomies with bilateral salpingoopherectomies. Seven patients had testosterone use prior to diagnosis. Two transgender females had estrogen therapy prior to rheumatologic presentation. Five patients had uncontrolled disease or relapse of their disease requiring adjustment of their treatment regimens. The most common co-morbidities were depression and anxiety (n=7, 58% patients), and 5 patients had a family history of autoimmune disease.

Conclusion: The majority of our patients were transgender males which corroborates with prior research that rheumatologic diseases have a higher prevalence for natal females. Larger studies are needed to assess whether hormone transitions can affect the incidence of rheumatologic diseases in transgender patients. We recommend careful documentation of medical transitions. Given the high prevalence of depression and anxiety, we also recommend assessing the mental health of transgender patients at each follow-up, and directing them to supports as needed.

Authors: Chantelle Carneiro PGY5 Rheumatology
Supervisor: Dr. K. Beattie

Poster Presentations

Clinical

1 – 36

1 - C Lance-Adams Syndrome Following Successful Cardiopulmonary Resuscitation: A Case Report & Review of Literature

Background: Lance-Adams syndrome (LAS) is an extremely rare entity defined by chronic post-hypoxic myoclonus, typically presenting postcardiopulmonary resuscitation. The hallmark features of LAS are action or intention myoclonus and cerebellar ataxia, with preserved consciousness, starting several days to weeks after the initial hypoxic insult. It is imperative to differentiate LAS from myoclonic status epilepticus, which presents more acutely, is associated with impaired consciousness, and is associated with a catastrophic prognosis.

Case Presentation: A 24 year old female with poorly controlled asthma was brought into hospital after a pulseless electrical activity (PEA) arrest lasting 10 minutes due to status asthmaticus, requiring cardiopulmonary resuscitation and intubation. Following her stay in in the intensive care unit, she was extubated and transferred to the ward where she began to display myoclonic jerks while conscious. Her physical exam revealed extensive intention/action myoclonus and unstable gait. Her MRI head and EEG were unremarkable. A diagnosis of LAS was given and the patient was started on Levetiracetam 500mg PO BID. Within 24 hours she noticed a significant reduction in the frequency of her myoclonus. Within three days, she was symptom-free and participating with physiotherapy to improve mobility.

Conclusions: This case demonstrates the importance of recognizing LAS so that appropriate treatment can be initiated. Although no well-defined therapy exists for management of this condition, the use of specific anti-epileptics have been shown to provide benefit. We hope this case serves as an educational tool for others to assist with recognition of this clinical entity and initiation of appropriate therapy.

Authors: Rishi Sharma PGY1, Brandon Budhram PGY2
Supervisor: Dr. M. Chum

2 - C Liver Enzyme Elevation and Eosinophilia with Atorvastatin: A Case of Probable DRESS Without Cutaneous Symptoms

Background: Drug reaction with eosinophilia and systemic symptoms (DRESS) is a potentially life-threatening hypersensitivity reaction to medication with close to 10% mortality. While relatively rare, early identification and discontinuation of the offending agent is critical. Due to the heterogeneity of presentation, the register of severe cutaneous adverse reactions (RegiSCAR) score is used for diagnostic validation.

Case Presentation: We present a case of DRESS in a 50-year-old female who presented with 4 days of persistent fevers, abdominal and flank pain, malaise, and generalized muscle weakness without any cutaneous symptoms following initiation of atorvastatin. She was febrile (38.5°C), with a heart rate of 72, and blood pressure of 93/51 mmHg. Her laboratory investigations demonstrated an Alkaline Phosphatase (ALP) of 792 U/L, Alanine aminotransferase (ALT) of 265 U/L, gamma glutamyl transferase (GGT) of 236 U/L, total bilirubin at 21 mg/dL, eosinophils 31000 cells/µL, leukocytes 20.2 K/µL. She had normal creatinine and troponin. Her serology for viral hepatitis was negative. Cytomegalovirus, and Epstein-Barr virus serologies were negative. Antinuclear Antibody (ANA), rheumatoid factor, anti-neutrophil cytoplasmic antibody (ANCA), Anti-mitochondrial and smooth muscle antibodies were negative. The patient was initially diagnosed with pyelonephritis. However, given eosinophilia, fever, acute liver dysfunction, exclusion of alternative diagnoses, and failure to improve on antibiotics, probable DRESS syndrome was diagnosed using the RegiSCAR criteria Atorvastatin was discontinued and with supportive measures alone, the patients' clinical status improved and laboratory investigations gradually normalized.

Conclusion: In patients with unresolving fever, eosinophilia, and organ dysfunction with a recent start of new medication, DRESS syndrome should be in the differential, even in the absence of rash. This is especially important since stopping the culprit drug is the mainstay of treatment.

Authors: Arman Zereshkian PGY1
Supervisor: Dr. S. Waserman

3 - C Coronary Artery Spasm Presenting as Recurrent Polymorphic Ventricular Tachycardia

Background: Coronary artery spasm (CAS) is an uncommon cause of myocardial ischemia that manifests with symptoms and ECG changes that mimic acute coronary syndrome. It represents a wide spectrum of disease depending on the underlying vascular territory of the culprit coronary artery. In rare circumstances, this can be accompanied by a variety of arrhythmias, ranging from atrioventricular conduction delay to ventricular arrhythmia and sudden cardiac death.

Case presentation: A 61-year-old male presented to clinic with intermittent chest pain associated with pre-syncope. He was admitted to hospital for further management and investigation of presumed symptomatic obstructive coronary artery disease (CAD). While in hospital, the patient had recurrence of his symptoms, with telemetry demonstrating a self-limiting run of a wide-complex tachycardia. The patient was advanced for urgent cardiac catheterization, which surprisingly demonstrated stable CAD. Subsequent echocardiogram was also unchanged from previous, with no significant structural heart disease. While awaiting provocative electrophysiology testing, the patient had further recurrence of symptoms. During this event, a 12-lead ECG was rapidly obtained, which demonstrated diffuse ST-elevation in the anterior leads with subsequent degeneration into polymorphic ventricular tachycardia. The patient was diagnosed with CAS and started on optimal medical therapy as well as referred for urgent implantable cardiac defibrillator (ICD).

Conclusions: This case highlights the unusual clinical presentations of CAS and challenges in diagnosis. Treatment of CAS focuses on preventing further vasospasm and consideration of an ICD for high risk individuals. There is limited evidence to guide the value of implanting an ICD. Risk stratification is important to identify at risk patients, and further data is needed to clarify long term survival outcomes.

Authors: Michael Rheaume PGY3
Supervisor: Dr. A. Mazzetti

4 - C Creepy Critters in the Pleura, Pleural Listeriosis: A Case Report & Literature Review

Background: Listeriosis is the entity of serious infection caused by the pathogen Listeria monocytogenes, a Gram-positive bacillus typically found soil, water and fecal content of mammals, often transmitted by consumption of particular items such as raw foods, cheeses, and meats. This infection primarily affects pregnant women, newborns, elderly individuals and immunocompromised individuals, such as those with underlying history of malignancy, HIV or undergoing immunosuppressive therapy. Listeriosis typically manifests as meningitis and bacteremia, while pleural listeriosis is extremely rare and scarcely reported in literature to date.

Case Presentation: A 64 year old male with history of type 2 diabetes, chronic kidney disease, pulmonary hypertension and congestive heart failure, presented to hospital with 1 month of exertional shortness of breath, acute on chronic kidney disease, abdominal pain, and melena. Chest radiographs revealed moderate right-sided pleural effusion, which cultured positive for Listeria monocytogenes. Source control was achieved with IR-guided pigtails, instilled with TPA/DNase for 3 days. He was treated with Ampicillin 2g IV BID for 4 weeks due to his renal function precluding him from receiving aminoglycosides. His symptoms resolved with clearance of the complicated pleural effusion and antibiotics. Listeria monocytogenes was not found in blood cultures, no other metastatic foci of infection were detected on imaging, and endoscopy showed presumed bleeding from angiodysplasia. The presumed source of infection is bacterial translocation from the gastrointestinal tract seeding a pre-existing benign pleural effusion.

Conclusions: Pleural listeriosis is a rare entity and scarcely reported in the literature. Our patient did not fall within populations typically afflicted by listeriosis and thus this case serves as a useful addition to the literature on pleural listeriosis and appropriate management for this disease entity.

Authors: Rishi Sharma PGY1
Supervisor: Dr. Z. Chagla

5 - C Left Ventricular mass in a patient with Spontaneous Coronary Artery Dissection and Normal Systolic Function – tumour or thrombus?

Background: Intracardiac masses (ICM) are categorized as neoplastic and non-neoplastic, with Left ventricular thrombi (LVT) being the most common etiology due to ischemic/non-ischemic cardiomyopathy. Primary intracardiac tumors (ICT) are relatively rare. LVT in patients with preserved left ventricular function are exceedingly rare – and as such – intracardiac tumour (ICT) must be ruled out.

Case Presentation: A 56-year-old female with peripheral vascular disease presented to emergency department with a two-day history of progressively worsening left foot numbness, and pallor with no chest pain or dyspnea. Her vital signs were normal, however her left foot was cool to touch and mottled with no detectable pulses. She underwent a contrast-enhanced computed tomography (CT) angiogram which demonstrated tibioperoneal trunk and popliteal artery occlusion in the left leg, and a 1.7x2.2 cm intraventricular hypodensity in the left ventricle concerning for thrombus. She was started on heparin infusion and was taken for emergent left femoral artery endarterectomy. Given the presence of suspected LVT, and high pre-test probability for coronary artery disease, she underwent cardiac catheterization which revealed Type 1 spontaneous coronary artery dissection (SCAD). Transthoracic echocardiogram demonstrated left ventricular ejection fraction (LVEF) of 59% with subtle anterior wall hypokinesis with a 18x16 mm highly mobile, inhomogeneous mass in the left ventricle attached via a short stalk. Given the unusual appearance, normal LVEF, and persistence after therapeutic anticoagulation, urgent cardiac MRI was obtained which demonstrated a non-enhancing mass in keeping with a thrombus.

Conclusion: In patients with an ICM where the diagnosis is ambiguous, particularly with normal LVEF, multi-modal imaging can help rule out a primary ICT. This in turn will reduce unnecessary invasive interventions and surgical procedures.

Authors: Arman Zereshkian PGY1, Justin Chow PGY6 Cardiology, Sulaiman Alrashidi PGY6 Cardiology
Supervisor: Dr. K. Connolly

6 - C Case of Suspected ITP & AMML Overlap

Background: Immune thrombocytopenia (ITP) is a reduction in platelet count due to acquired autoantibodies to platelet antigens estimated to have an incidence of 1.6 per 100 000 per year. The treatment pathway for ITP includes steroids and intravenous immunoglobulin, with splenectomy being a consideration for refractory cases. While other hematologic disorders are known to precede hematologic malignancies like acute myelomonocytic leukemia (AMML), ITP is not documented to do so. The following case offers unique insight into rare possible overlay of these two conditions while also highlighting the differences between ITP and other secondary causes of thrombocytopenia.

Case Presentation: A 76 year-old male had previously presented to a community hospital after an episode of neurologic symptoms and was found to have a platelet count of two and intracranial bleeding on imaging. After receiving appropriate therapy he had persistent critical thrombocytopenia and was referred to our centre for minimally invasive splenectomy. On admission, he was preferred to the internal medicine service for pre-operative management of his refractory ITP. On assessment, in addition to his thrombocytopenia he was found to have a significant monocytosis. His surgery was delayed, a bone marrow biopsy completed, and ultimately he was diagnosed with AMML with possible ITP overlap with plan to receive hemotherapy.

Conclusion: In addition to highlighting the diagnostic and treatment pathway for ITP, this case offers unique teaching points about how multiple disease states can occur, and about the different clinical manifestations of ITP compared to secondary thrombocytopenia. Lastly, this case offers a reminder to clinicians to challenge previously made diagnoses, avoid anchoring and early diagnosis closure. In this patient's case it allowed him to receive appropriate therapies earlier.

Authors: Carter Winberg PGY1
Supervisor: Dr. J. Douketis

7 - C Patient Outcomes and Healthcare Worker Safety Related to Tracheostomy in Critically Ill Ventilated COVID-19 Positive Patients

Tracheostomy is an essential procedure for patients requiring prolonged mechanical ventilation, however it is controversial in patients with COVID-19-related-acute respiratory distress syndrome (ARDS). This multicentre case series was undertaken to determine if tracheostomies can be performed safely in COVID-19 patients without transmission of infection to healthcare providers. Seven COVID-19 positive patients that underwent tracheostomy were included. Descriptive analysis was undertaken with a focus on patient-important outcomes (mortality, duration of ventilation, and time to discharge from the intensive care unit) as well as healthcare provider workplace absences due to COVID-19. 100% of patients were discharged from hospital alive. Furthermore, o healthcare providers developed symptomatic SARS-CoV2 infection as a result of being involved in tracheostomy procedures for their patients. Tracheostomies are essential when providing critical care to patients with prolonged respiratory failure. This case series suggests that tracheostomy can be performed safely under conditions that protect healthcare workers in the COVID-19 era.

Authors: Jaymee Shell PGY2, Candice Griffin PGY3
Supervisor: Dr. R. Kruisselbrink

8 - C A Case of a 48-year-old Female with Shortness of Breath and Dry Hands

Background: Anti-synthetase syndrome is a rare variant of inflammatory myositis characterized by the presence of an autoantibody against acetylate tRNA and at least one of three clinical features including interstitial lung disease, inflammatory polyarthritis, and inflammatory myositis.

Case Presentation: We report a case of a 48-year-old woman presenting with 2-week of worsening dyspnea on exertion, mMRC class 4, requiring supplemental oxygen 5L/min. On examination, she had bibasilar inspiratory crackles. Her skin was significantly thickened, hyperkeratotic, scaly and fissured on the tips and sides of the fingers and thumbs bilaterally, consistent with "mechanics hands". She also had dactylitis and swelling of several small joints. CT of the chest revealed extensive interstitial lung disease, with septal thickening and mixed alveolar and interstitial opacities. Creatine kinase was within the normal range, but the myositis autoantibody panel was strongly positive for anti-Jo1 antibodies. MRI directed biopsy of the thigh revealed an inflammatory autoimmune myositis. A diagnosis of antisynthetase syndrome was made and she received pulsed steroids with an initial response. However, at her outpatient follow-up, had relapsing disease and required additional pulsed steroids and cyclophosphamide.

Conclusions: This is a case of a patient presenting with anti-synthetase syndrome which highlights the pathognomonic clinical features of this rare entity. We review the importance of early diagnosis, potential pitfalls and emphasize the importance of early treatment. The early management of her disease did not lead to initial remission of her symptoms and therefore ongoing research would be helpful to guide therapeutic advances to care for these patients.

Authors: Coralea Kappel PGY2
Supervisor: Dr. N. Khalidi

9 - C Legionella Pneumonia Presenting as Cerebellar Dysfunction

A 51 year-old male presented to hospital with ataxia and was found to have other signs of cerebellar dysfunction on examination. During hospital admission, further work-up included chest imaging that revealed a large consolidation eventually leading to the diagnosis of Legionella. This case write-up reviews high-yield information about Legionella pneumonia including its unique ability to cause multi-system dysfunction and various symptomatic presentations. The neurologic abnormalities are focused on with a specific review of the literature on cerebellar dysfunction with Legionella as seen in this case. Our write-up demonstrates how clinicians must include Legionella pneumonia on their differential diagnosis when there is a combination of respiratory and neurologic pathology, even when respiratory symptoms are not the presenting concern.

Authors: Carter Winberg PGY1, Alex Grindal PGY2
Supervisor: Dr. A. Chakroborty

10 - C Probable Fondaparinux Associated Bullous Hemorrhagic Dermatosis

Background: Bullous hemorrhagic dermatosis (BHD) is a non-immune mediated side effect of heparinoid anticoagulants characterized by painless lesions with distribution to the extremities that typically occurs approximately 7 days after exposure.

Case Report: We report a 90-year-old female who developed BHD on day four of exposure to fondaparinux to the left upper extremity. The lesions progressed with increased number, size, tension and eventual involvement of the right upper extremity. The largest bulla to the left epicondyle ruptured on day six of therapy and subsequently the patient had a clinically significant hemoglobin drop with hemodynamic instability requiring transfusion. Fondaparinux was discontinued given the ongoing bleeding on day seven of therapy. Rheumatological and infectious aetiologies were ruled out and punch biopsy demonstrated dermal solar elastosis and atrophic epidermis. Following discontinuation of the fondaparinux there was complete desiccation and resolution of the bulla by day-27.

Conclusions: BHD has most commonly been reported with enoxaparin and is likely under-reported. The differential diagnosis for hemorrhagic bulla is broad and includes warfarin-induced skin necrosis, vasculitis-related hemorrhagic bullae, mechanical friction blisters and bullous hemorrhagic cellulitis. The pathophysiology of BHD is thought to be due to epidermal fragility which would be consistent with the atrophic dermatitis described in our patient. The most common treatment strategy is cessation of offending agent, though as BHD is self-limited some cases report continuation of anticoagulant with careful observation. BHD is an important adverse drug reaction, especially with the increasing use of heparin-related anticoagulants, early recognition and options for ongoing anticoagulation must be evaluated on an individual patient basis.

Authors: Kate Lovatt PGY2
Supervisor: Dr. H. Yousuf

11 - C Hypercalcemia and Osteolytic Bone Lesions in an Immunocompetent Host with Disseminated Non-Tuberculosis Mycobacteria Infection

Background: Non-tuberculous mycobacteria (NTM) are opportunistic pathogens that usually affect immunocompromised hosts. The respiratory system is most affected. Rarely, osteomyelitis can develop from a disseminated infection. Hypercalcemia is another rarely reported complication. We present a case of osteomyelitis and hypercalcemia associated with disseminated NTM infection in an immunocompetent host.

Case presentation: A 65-year-old male presented with pneumonia symptoms and was treated as presumed legionella pneumonia based on positive PCR result from a bronchoalveolar lavage sample. He had non-specific rib lesions. Several months later, he developed generalized lymphadenopathy and a diffuse verrucous rash. A lymph node excisional biopsy and skin biopsy showed granulomatous inflammation. He was readmitted with similar symptoms and progression of bone lesions. A pelvic bone biopsy showed acid fast bacilli on smear. He was treated for presumed disseminated tuberculosis. After discharge, PCR on the bone sample and MALDI-TOF on pleural fluid both showed mycobacterium avium cellulare (MAC). His therapies were modified to include a macrolide. An immunodeficiency work-up was negative.

He also had elevated calcium that paralleled his constitutional symptoms. Parathyroid hormone, angiotensin-converting enzyme, and 25-hydroxy vitamin D levels were normal. It was not temporally correlated with the progression of bone lesions.

Conclusions: Our case demonstrates the indolent and non-specific presentation of an NTM infection. Osteomyelitis should be considered with diffuse lytic lesions usually through haematogenous spread. The mechanism of hypercalcemia is unclear; existing literature proposes a vitamin D-mediated process. While tuberculosis often causes hypercalcemia, other infections such as NTM are less known causes that should be considered in certain clinical contexts. Finally, our case shows the importance of using multiple diagnostic modalities including biopsy in diagnosing an NTM infection.

Authors: Tina Zhou PGY1, Anthony Sandre PGY3
Supervisor: Dr. A. Patel

12 - C A Diagnosis by Any Other Name: An Unusual Presentation of Sweet Syndrome

Background: Acute febrile neutrophilic dermatosis, also known as Sweet syndrome, is an inflammatory disorder that presents with an abrupt onset of a painful rash, often accompanied by fever and leukocytosis. It is often associated with hematologic malignancy, drugs, or infection, but can be idiopathic or related to autoimmune diseases.

Case Report: A 79-year-old female presented to hospital with a one-week history of intermittent fevers, a patchy macular rash, and no other localizing symptoms. She had recently been treated with nitrofurantoin for a suspected urinary tract infection, and was admitted with an initial diagnosis of urosepsis. Her fevers and leukocytosis persisted despite four days of ceftriaxone, with persistently negative blood and urine cultures. She was also found to have marked neutrophilia (27.4) and elevated acute phase reactants (ferritin 39100, CRP 334). Based on this, she was evaluated for hemophagocytic lymphohistiocytosis, infectious, and malignant causes. Unfortunately, her clinical picture was muddied by a hospital-acquired COVID-19 infection.

After a comprehensive negative work-up, autoinflammatory syndromes remained on the differential. Atypical adult-onset Still's disease was suspected, and biopsies of a confluent erythematous neck rash were done to clarify the diagnosis. Pathology demonstrated a primarily neutrophilic leukocytoclastic dermal infiltrate, suggestive of Sweet syndrome. She was started on prednisone, and improved with therapy.

Conclusion: Autoinflammatory conditions are important considerations for patients presenting with fevers and hyperferritinemia. Infectious and malignant causes should be ruled out, however, before considering these rare diagnoses. This case highlights the important of biopsy in securing diagnoses where rashes are involved, as Sweet's syndrome is not commonly considered on the differential for marked hyperferritinemia.

Authors: Azim Arden PGY2, Mats Junek PGY4 Rheumatology
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13 - C Heparin-Induced-Thrombocytopenia in First Trimester Of Pregnancy: A Rare Complication And Clinical Therapeutic Dilemma

Heparin-based anticoagulants are the first line agents for treating thromboembolism in pregnancy. Heparin-induced-thrombocytopenia (HIT) is an uncommon immune reaction whereby the patient develops anti-PF4/heparin antibodies. It rarely occurs in the first trimester and has significant clinical implications given the long duration of anticoagulation and the teratogenicity risks of anticoagulants to the developing fetus. Clinical presentation includes thrombocytopenia-related bleeding, generalized malaise and clot development or propagation.

A 41-year-old G5P4 female presented with a left leg DVT, elevated d-dimer and extensive clot burden at 11 weeks gestation secondary to being bed-bound for hyperemesis gravidarum. She was treated with therapeutic dalteparin and discharged home. She continued to experience symptoms and on treatment day-12 demonstrated a platelet count of 34 x109/L. Her factor-4-heparin enzyme immunoassay was positive, as was the serotonin release assay, confirming a diagnosis of HIT. Fondaparinux started at therapeutic dosing for three months, followed by prophylactic dosing until delivery. She delivered a healthy baby by scheduled induction without neuraxial analgesia at 37 weeks.

The choice of therapeutic anticoagulation agent in the patients with HIT in the first trimester of pregnancy is complicated by the contraindications of warfarin in the first trimester, difficulty of use of argatroban and danaparoid, and the paucity of data for alternative anticoagulation agents. Including this case, a total of 11 case reports of HIT in the first trimester have been documented. In these cases the anticoagulant agents used were lepirudin (N=3), argatroban (N=2), fondaparinux (N=2) and danaparoid (N=1). In our case fondaparinux was selected due to availability and ease of daily administration. Our patient was supported by careful obstetrical monitoring and delivery planning, and prophylactic dosing during later trimesters.

Authors: Kate Lovatt PGY2
Supervisor: Dr. M. Crowther

14 - C First Case Of COVID-19 N501Y Variant Infection in a Patient with Chronic HIV Infection

Background: COVID-19 pneumonia continues to have high prevalence, mortality, and morbidity. Typical presentation includes fever, cough, shortness of breath, and minor symptoms such as fatigue, diarrhea, anosmia, ageusia, and myalgia. There is limited data on the outcomes of HIV-infected patients with COVID-19.

Case Presentation: A 62-year-old male presented with abdominal pain, unexplained fever (38.0C), and constitutional symptoms. His medical history included decompensated alcoholic cirrhosis, and well managed HIV. He did not have any travel history, or known COVID-19 exposures. COVID-19 PCR on NPS on admission was negative. A CT of the chest did not show evidence of atypical pneumonia or COVID-19 infection. Given these results, we considered COVID-19 to be satisfactorily ruled out. Further work up for unexplained fever including infectious, inflammatory, and malignant etiologies were negative. Diagnostic paracentesis ruled out spontaneous bacterial peritonitis. On day 4, the patient became hypoxic. A repeat NPS performed on day 5 was positive for the N501Y COVID-19 variant of concern. Treatment was initiated with dexamethasone, together with ceftriaxone and doxycycline for possible concurrent pneumonia. On day 7, the patient developed worsening hypoxemia requiring ICU admission. Unfortunately, he continued to deteriorate despite optimal medical treatment, and died of COVID-19 pneumonia on day 12.

Conclusion: Due to increased prevalence of COVID-19 and emergence of variants of concern, diagnostic testing for COVID-19 should be repeated in patients who are persistently febrile despite previous negative swabs and lack of exposure. Patients with immunocompromised states, such as HIV infection, may have atypical clinical presentations, time to PCR positivity, or imaging findings of COVID-19. A thorough investigation for other causes of unexplained fever should also be conducted despite community prevalence of COVID-19.

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Supervisor: Drs. M. Crowther & J. Neary

15 - C Isolated Respiratory Failure as the Presenting Feature of Myasthenia Gravis: A Case Report and Review of the Literature

Background: Respiratory failure is the most concerning manifestation of myasthenia gravis, leading to higher rates of mortality in affected patients. While respiratory muscle weakness often presents later in the disease course, isolated respiratory failure as the presenting feature of myasthenia gravis is rarely described in the literature.

Case presentation: An 80-year-old male was admitted to hospital for 3-months of progressive dyspnea. His medical history was significant for a two-minute PEA arrest of unclear etiology two months prior, requiring CPR, intubation, and a 1-week ICU admission. During his current hospitalization, his resting oxygen saturation was 90% but fell to 78% after ambulating 25 meters, with associated tachypnea (from 18 to 30 breaths per minute) and tachycardia (from 84 to 110 bpm). His reduced oxygen saturation quickly recovered with supplemental oxygen.

Initial spirometry demonstrated a very-severe mixed obstructive/non-obstructive ventilatory defect (FEV1 29%, FVC 50%). Computed tomography of the chest was unremarkable. Serial blood gases demonstrated PaCO2s peaking at 93mmHg, a PaO2 of 45mmHg (room air), and a normal alveolar-arterial gradient suggestive of alveolar hypoventilation. Subsequently, repetitive nerve stimulation studies were performed confirming a diagnosis of myasthenia gravis. The patient was initiated on IVIG (followed by pyridostigmine) and prednisone with rapid improvement of functional capacity, hypoxia, and hypercapnia. Prior to discharge, repeat spirometry demonstrated significant interval improvement with a residual moderately severe obstructive ventilatory defect (FEV1 55%, FVC 79%). The patient was discharged with nocturnal non-invasive ventilation, no longer requiring supplemental oxygen.

Conclusion: Myasthenia gravis can rarely manifest as isolated respiratory muscle weakness. Clinicians should include alveolar hypoventilation caused by myasthenia gravis in the differential of mixed respiratory failure, especially in the setting of a normal alveolar-arterial gradient.

Authors: Brandon Budhram PGY2
Supervisor: Dr. H. Neighbour

16 - C A Case of Cavitary Empyema Caused by Slackia Exigua, a Gram Positive Obligate Anaerobic Bacillus from the Human Oral Microbiome

Slackia exigua is a gram positive obligate anaerobic bacillus isolated primarily in periodontal infections and rare cases of extraoral human infections including prosthetic joints, intra-abdominal abscesses, and meningitis. We report a case of bilateral, cavitating empyema in a 56 year-old female with chronic obstructive pulmonary disease (COPD) and obstructive sleep apnea (OSA) who presented with a three-month history of worsening dyspnea, cough, and hemoptysis. Empyema was confirmed by pleural fluid studies and computerized tomography (CT) imaging, which was treated with a pleural drain and broad-spectrum antibiotics. Following the growth of S. exigua, the patient's antibiotic regimen was narrowed given similar antimicrobial susceptibility to other gram-positive anaerobes such as Peptostreptococcus.

To our knowledge, we report the sixth ever case of lung empyema involving S. exigua, and amongst these reported cases, there remains no clear risk factor for extra-oral infection apart from a possible association to poor dentition. A previously reported case in the literature describes a patient with an underlying, rare mitochondrial disorder who required non-invasive ventilation with a tracheostomy; interestingly, our patient had a remote history of continuous positive airway pressure (CPAP) use. It remains unclear whether non-invasive mechanical ventilation could act as a conduit for S. exigua to colonize the lung parenchyma and eventually cause lung empyema. Though aspiration would be suspected in the case of oral anaerobes causing empyema, there was no history of aspiration or thoracic trauma in our case, nor in the majority of cases reported in the literature. More research is needed to better elucidate the clinical profile of non-oral S. exigua infection as well as the role of hematogenous spread in both respiratory and non-respiratory S. exigua infections.

Authors: Sharef Danho PGY1
Supervisor: Dr. N. Mohammed

17 - C A Coagulation Conundrum: A Case of an Elevated INR Secondary to Combined Factor V and VII Deficiency

Background: Combined factor V and VII deficiency is a rare coagulopathy, caused by two distinct independently segregating genetic defects. Clinical presentation ranges from asymptomatic to life-threatening bleeding. We report a case of combined factor V and VII deficiency that was initially misdiagnosed as vitamin K deficiency.

Case: A 54-year-old female presented to hospital with non-ST elevation myocardial infarction. Workup revealed an elevated INR of 2.0 (normal range 0.8-2.0). Thrombin time and partial thromboplastin time were normal. Clauss fibrinogen was 2.2. She was not on anticoagulant therapy. The INR did not correct after a cumulative dose of 30 mg of intravenous/oral vitamin K. Factor assays revealed reduced FVII (0.12) and FV (0.39), with normal FII-biological (0.65), FII-Echis(0.61), FX (0.84), FXI (0.98), and FXII (1.22). FVIII (3.45), FIX (1.60), von Willebrand factor antigen (1.95) and activity (2.16) were elevated. Initially, coagulopathy of liver disease was suspected given hepatic steatosis on abdominal imaging, however there was no biochemical evidence of cirrhosis. Bleeding history suggested a longstanding coagulopathy; she received frozen plasma empirically prior to surgeries in the remote past. During her hospital stay, she underwent coronary artery bypass grafting with perioperative recombinant FVIIa and awaits confirmatory genetic testing.

Conclusion: Our case demonstrates that a thorough bleeding history can help distinguish between inherited and acquired coagulopathy. Only a small number of case reports have described co-inheritance of Fac tor V and VII deficiency. Specialized factor assays and confirmatory genetic testing are needed to make a diagnosis and treatment plan.

Authors: Mohammad Jay PGY1, Joanne Britto PGY4 Hematology
Supervisor: Dr. S. Mithoowani

18 - C A Challenging Case of Concurrent Anion Gap and Non-Anion Gap Metabolic Acidosis in The Third Trimester of Pregnancy

Renal tubular acidosis (RTA) refers to a group of disorders in which renal acid-base regulation is impaired, resulting in non-anion gap metabolic acidosis (NAGMA). They can be inherited, associated (drugs or underlying disease) or idiopathic. New-onset RTA in pregnancy is a described but rare phenomenon.

A 32-year-old primigravid patient at 36.5 weeks gestation presented with dyspnea, tachycardia, vomiting and painful stomatitis limiting oral intake. A vesicular lip lesion swab was positive for Herpes simplex virus. Further investigations revealed an anion gap metabolic acidosis (AGMA) with elevated beta-hydroxybutyrate and ketonuria, in keeping with starvation ketosis. Additionally, her delta-delta ratio suggested a concomitant NAGMA. Her initial urine anion gap suggested RTA type 2, with persistently low bicarbonate level and intermittent hypokalemia. After other causes were rapidly excluded, her dyspnea was established as compensatory Kussmaul breathing due to severe metabolic acidosis and she was started on dextrose infusion and valacyclovir. Her urine gap, AGMA and symptoms improved after several days, and fluids were discontinued. Shortly thereafter, she developed a fever, with recurrence of ketonuria and acidosis. Given her gestational age, unclear diagnosis and desire to avoid fetal complications, an induction of labor was initiated. After an uncomplicated delivery, the patient's acidosis rapidly resolved, and she remained asymptomatic.

While pregnancy is known to increase susceptibility to rapid development of starvation ketosis, new onset RTA is a rare and poorly understood entity, with unclear maternal-fetal outcomes. As in this case, there is possibility for missed diagnosis if masked by concomitant AGMA. Careful blood gas analysis in all pregnant patients presenting with unexplained dyspnea and/or metabolic acidosis is vital as the identification of a refractory NAGMA may warrant early obstetrical intervention.

Authors: Laura Spatafora PGY1
Supervisor: Dr. A. Cheung

19 – C Off Balance: Erdheim-Chester Disease in a 63-year-old Male with Ataxia

Case: A 63-year-old male presented to the Emergency Department with a 6-day history of worsening ataxia and a 1-day history of dysarthria. His past medical history was significant for prior cerebellar stroke and perirenal retroperitoneal fibrosis. On examination, he was found to have ataxic gait, dysmetria, akathisia, and chorea-like movements. Initial investigations were significant for acute kidney injury (creatinine 290 umol/L) and normal CT head. He was admitted for further investigation and management. Throughout his hospital stay the patient was intermittently febrile (> 38˚ C) with negative infectious workup. Autoimmune disease testing (ANA, anti-GAD65, anti-MOG, neuromyelitis optica, and IgG4) was negative. An initial MRI head identified subtle areas of punctiform enhancement in the pons and middle cerebellar peduncles bilaterally that were non-specific. On day 6, he developed acute anuria, renal injury, and hypernatremia (Na160mmol/L) secondary to retroperitoneal fibrosis, and an emergency ureteral stent was placed. His hypernatremia responded to vasopressin, suggesting a diagnosis of central diabetes insipidus. The constellation of retroperitoneal fibrosis, central diabetes insipidus, and cerebellar involvement prompted consideration of Erdheim-Chester Disease (ECD). This was supported through bilateral tibia-fibula Xray imaging showing the presence of symmetric metaphyseal and diaphyseal bone sclerosis. Two cube tibial biopsies confirmed sclerotic bone with scant histiocytosis and the presence of foamy macrophages. Initial BRAFV600E mutation testing on serum and bone sample was negative requiring a second biopsy.

Discussion: ECD is a rare form of non-Langerhans' cell histiocytosis with multi-system involvement and a high rate of mortality if not treated. Diagnosis is challenging with significant implications on management as new therapies become available. Increasingly, we learn about the role of BRAF-V600E mutation, its association with ECD, and new targeted treatments.

Authors: Barbara Gunka PGY1, Stefan Jevtic PGY1
Supervisor: Dr. N. Khalidi

20 – C Leukocytoclastic Vasculitis Mimicking Sweet's Syndrome in a Patient with Axial Spondyloarthritis

Background: Axial spondyloarthritis (SpA) is a seronegative arthritis characterized by involvement of the spine and sacroiliac joints. It is associated with many extra-articular manifestations including skin changes and inflammatory bowel disease.

Case Presentation: A 32-year-old male with SpA controlled on Etanercept presented to hospital with a two-week history of bloody diarrhea and a five-day history of high fevers (Tmax 39.9C); tender pustular nodules on his neck, trunk and arms; shortness of breath; conjunctivitis (without uveitis on slit lamp examination), and sinusitis. On physical exam he was hypoxic (Sp02 86%) and exhibited pathergy. Investigations revealed marked neutrophilia and thrombocytosis, and increased acute phase reactants. The presentation was initially thought to be consistent with Sweet's syndrome. Infection was ruled out with cultures from blood, broncho-alveolar lavage, eyes, stool and urine. Bronchoscopy revealed endobronchial lesions similar in appearance to the pustular nodules found on the skin; biopsy only demonstrated reactive changes. A bone marrow biopsy (done to rule out myeloproliferative neoplasia) demonstrated cellular bone marrow consistent with reactive changes. JAK2 mutation testing was negative. Biopsy of a skin nodule showed leukocytoclastic vasculitis (LCV). Endoscopy and multiple colonic biopsies showed acute and chronic inflammation consistent with ulcerative colitis. It was felt that the patient's presentation was most consistent with ulcerative colitis and secondary LCV and he was started on Prednisone at 1mg/kg with good effect.

Conclusions: This gentleman presented with ulcerative colitis and multiple extra-intestinal manifestations in the context of SpA, previously well controlled on Etanercept. His diagnosis was initially phenotypically suggestive of Sweet's syndrome with ulcerative colitis, however histology suggested that it was LCV mimicking Sweet's syndrome. To our knowledge, such a presentation has not been described.

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21 – C Refractory Hyperlactatemia and Hypoglycemia in an Adult with Non-Hodgkin's Lymphoma: A Case Report and Review of the Warburg Effect

Lactate is a byproduct of anaerobic glycolysis and hyperlactatemia is commonly seen in critically ill patients. We report a case of an elderly male presenting with undifferentiated constitutional symptoms, anemia, thrombocytopenia, severe lactic acidosis, refractory hypoglycemia and newly detected abdominal mass. Dedicated workup ruled out infectious etiologies and revealed metastatic non-Hodgkin's lymphoma.

Warburg describes a unique shift in a tumor's metabolic physiology to 'aerobic glycolysis' regardless of the local oxygenation status was noted. In advanced cases, as glucose is sequestered and preferentially driven through the pyruvate-lactate pathway, overwhelming glucose consumption occurs with eventual hypoglycemia and lactate production.

Our patient's lactic acidosis and hypoglycemia persisted despite resuscitative fluids, antibiotics, dextrose infusions and worsened following administration of steroids. This can likely be attributed to multiple factors. Firstly, the development of tumor lysis syndrome, which has been associated with steroid initiation in high disease burden states in malignancies. Secondly, the gradual onset of sepsis from aspiration and pneumonia almost certainly contributed. Finally, with onset of multiorgan failure, hepatic dysfunction would have ensued and worsened the lactic acidosis and hypoglycemia eventually resulting in circulatory collapse and his demise.

Warburg effect is a paraneoplastic phenomenon of hyperlactatemia and hypoglycemia that should be considered on the differential for acutely ill patients with a suspected malignancy, especially those with a high disease burden. Patients demonstrating Warburg's effect likely have higher risk of morbidity, mortality, and potential conversion to tumor lysis syndrome. Management should be targeted towards the underlying malignancy along with supportive fluids, dextrose and close monitoring for infectious complications. Warburg's effect may present a unique window of opportunity for salvage therapy however more research is needed to understand its prognostic significance.

Authors: Zainab Al Maqrashi PGY1, Mary Sedarous PGY2
Supervisor: Dr. A. Wyne

22 – C Mysterious Masses: The Case of an Unusual Seminoma

Extragonadal germ cell tumors (EGCT) such as seminomas are uncommon tumors originating with a primary location outside of the testes, either in the anterior mediastinum or retroperitoneum. Symptomatic mediastinal seminomas present with chest pain, dyspnea, and weight loss. Laboratory testing may reveal an elevated serum beta-HCG and LDH in advanced disease. Previously reported cases of seminoma EGCT have noted granulomatous findings on pathology which have hindered diagnoses leading to treatment delays. Here we describe a man with a posterior mediastinal and retroperitoneal mass with an initially inconclusive biopsy, later confirmed to be an EGCT seminoma.

A healthy 48-year-old man was investigated for several months of palpitations, dyspnea on exertion, and weight loss. A CT chest and abdomen revealed a large posterior mediastinal mass encasing the thoracic aorta along with a large retroperitoneal mass. An initial retroperitoneal biopsy showed granulomatous lymphadenitis without evidence of malignancy. The sample was too small for further diagnostic delineation and a second tissue sample was requested. The second biopsy showed a malignant germ cell tumor consistent with a seminoma. The patient's tumor markers included serum LDH 3780, hCG 31.9, and AFP < 1. Testicular ultrasound was negative for a primary tumor and the patient was diagnosed with an extragonadal seminoma.

It is important to keep a broad differential for masses of unknown etiology. While classical locations for tumors should guide the differential diagnosis, exceptions exist, as in this case of a seminoma presenting in the posterior mediastinum and retroperitoneum. Further, if an initial biopsy is not adequate or in keeping with the clinical and radiologic presentation, it is important to consider a second biopsy with expert pathology review for diagnostic clarification.

Authors: Brianna Barsanti-Innes PGY1
Supervisor: Dr. A. Prebtani

23 – C Hemoglobin SC Disease Presenting with Acute Chest Syndrome

Hemoglobin sickle cell disease is one of the most commonly inherited blood disorders. The most common subtypes being Sickle Cell Anemia (SS) and Sickle Hemoglobin-C Disease (SC). Acute chest syndrome is a complication of SCD that can cause significant morbidity. Transfusion therapy is considered to be the standard treatment in patients with ACS to significantly in crease oxygenation in those high risk of respiratory failure.

A 61 year old female with African decent presented to the hospital with generalized pain radiating through out the chest, back and abdomen, associated with fever, significant shortness of breath, requiring oxygen, and fatigue. Patient has a history of sickle cell disease with no documented follow up or previous noted sickle cell crisis except for pain control with NSAIDs. She had a significant gram drop in hemoglobin and a chest x-ray showed bilateral opacities and significant atelectasis with pleural effusions. Subsequently, the patient was recognized to have hemoglobin SC disease, with acute chest syndrome. After appropriate treatment, including exchange transfusion, hydration, pain management, and antibiotics, patient's respiratory status and pain improved and was discharged home with outpatient follow-up.

Doctors should always have a high suspicion for acute chest syndrome when a SCD patient presents with a vast-occlusive crisis. Early treatment should be initiated quickly and aggressively since the disease process escalates quick. Treatment should include pain control, intravenous fluids, antibiotics, supplemental oxygen, and blood transfusions. Exchange transfusions are used in severe cases of ACS. Indications would include multi lobar disease on chest x-ray, severe hypoxemia, or failure of blood transfusion. The main goal of exchange transfusion is to increase hemoglobin to ten and decrease HbS to less than 30%.

Authors: Alhan Alqinai PGY1
Supervisor: Dr. N. Chan

24 – C Multifocal Arterial Thromboembolism Associated with Disseminated Intravascular Coagulation And Severe Natural Anticoagulant Deficiency Complicating Hepatic Cirrhosis: A Case Report

Disseminated intravascular coagulation (DIC) is characterized by pathological thrombin generation with increased risk of thrombosis and/or bleeding. We describe a case of septicemia-associated severe DIC in the setting of cirrhosis, complicated by multifocal arterial thromboembolism. Recent reports of septicemia-associated DIC complicated by microvascular thrombosis and distal extremity limb losses have indicated a role for acute or chronic liver disease in predisposing to severe depletion of natural anticoagulants. Our observations suggest that deficiency of natural anticoagulants during acute septicemia in the setting of cirrhosis might also predispose to multicentric arterial thromboembolism.

A 57-year-old female presented with methicillin resistant Staphylococcus aureus bacteremia. Her medical history included liver cirrhosis (Stage 4). Initial laboratory values included platelets of 18 x109/L (150-400 x109/L), INR 1.5 (0.8-1.2), prothrombin time 18.4 seconds (11-15 seconds), fibrinogen 0.9g/L (1.6-4.2g/L), D-dimer >20,000 microgram/L (<500 microgram/L) and a positive hemolysis screen. She was diagnosed with severe DIC (ISTH DIC score of 7). Serial protein C activity levels were below the limit of detection (<10%) and antithrombin activity was reduced to 0.27U/ml (0.77-1.25U/ml). A CT angiogram revealed thromboembolism of the superior mesenteric and right external iliac arteries and an echocardiogram was suggestive of mitral valve endocarditis. She was managed with antibiotics and a heparin infusion and was taken urgently to the OR for embolectomy and bowel resection. The heparin infusion was discontinued prematurely due to postoperative bleeding. Despite a combination of medical and surgical interventions, the patient died of multi-organ failure.

Our case highlights that natural anticoagulant deficiency from liver disease may predispose to thromboembolism in the setting of DIC. Clinicians should consider resuscitation with plasma in such patients to avoid further depletion of natural anticoagulants.

Authors: Tammy Ryan PGY3
Supervisor: Dr. S. Mithoowani

25 – C All That Meets the Eye May Be Confusing

Background: Topical ophthalmologic medications are commonly prescribed for a variety of indications. While they intend to target their effects within the eye, because of their bioavailability, they may result in unintended systemic effects. Atropine, an anticholinergic agent which blocks postganglionic muscarinic receptor, is used ocularly in the treatment of iritis, uveitis and amblyopia. Its systemic use is well recognized in unintentionally causing an anticholinergic syndrome which manifests in a constellation of symptoms including central nervous system effects. Delirium in adults attributed to ocular Atropine use is reported in case reports dating as far back as 1935. Here we describe a woman who developed delirium after using prescription Atropine ophthalmic drops.

Case: An independent 80-year-old woman, presented to the emergency department and was referred to internal medicine for delirium NYD. Her past medical history did not include any significant psychiatric illnesses or previous episodes of delirium. She was afebrile and vitally stable without any focal neurological deficits. Standard investigations for delirium were unrevealing. However, upon reviewing recent medication changes, it was discovered that the patient had been recently prescribed 1% Atropine eye drops for a corneal abrasion she had suffered. The patient's family noted increasing confusion including hallucinations after starting the prescription. The patient was admitted to hospital and the Atropine eye drops were discontinued. Two days after admission the patient's hallucinations resolved and she returned to her cognitive baseline.

Conclusions: Due to its high systemic bioavailability, ocular Atropine administration may induce an anticholinergic delirium similar to its systemic formulation. Therefore, when evaluating possible precipitants for a patient with delirium, one must be vigilant to remember that non-oral medications must be considered as a potential trigger.

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26 – C Association Of IL-17 Inhibitor Treatment with New or Worsening Inflammatory Bowel Disease: A Case Series

Background: Interleukin 17 (IL-17) inhibitors (secukinumab, ixekizumab, brodalumab) are an effective treatment option for patients with psoriasis (PsO), psoriatic arthritis (PsA), and ankylosing spondylitis (AS). Despite the association between these diseases and inflammatory bowel disease (IBD), IL-17 inhibitors are ineffective in IBD and rarely associated with new or worsening disease. We describe three patients treated with IL-17 inhibitors who developed IBD.

Cases: #1: 50-year-old male with PsO who developed bloody diarrhea two months after initiating ixekizumab. His course was complicated by a colonic perforation requiring surgery. He was diagnosed with CD and initiated on infliximab and methotrexate, achieving clinical remission of his CD and partial response of his PsO.

#2: 39-year-old male with AS and chronic diarrhea and abdominal cramping. His symptoms improved while on golimumab and etanercept. He failed these and started secukinumab, with acute worsening symptoms. He was diagnosed with CD and switched to adalimumab, which resulted in partial clinical response of his CD and AS.

#3: 63-year-old female with PsA reported diarrhea, abdominal pain, and fever, after being on ixekizumab for four months prior after failing adalimumab, secukinumab, and etanercept. Imaging and colonoscopy demonstrated evidence of IBD. Despite self-resolution of her diarrhea, she was initiated on infliximab without improvement of her PsA.

Conclusion: Clinical trials of secukinumab and brodalumab treatment in moderate-severe CD have shown that IL-17A blockade was ineffective and resulted in more adverse events. Overall incidence of new onset IBD in treated patients was low, but a high percentage of patients with known IBD experienced exacerbations during treatment. Clinicians should be aware of the possible association between IL-17 inhibitors and IBD, and screen patients for undiagnosed IBD prior to initiating treatment.

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27 – C Management of Intentional Low Molecular Weight Heparin Overdose: The McMaster University Experience

Low molecular weight heparin (LMWH) overdose is rare but may result in serious bleeding. There is no consensus on optimal management. Among 10 previous case reports describing 16 incidents of LMWH overdose, one patient died and five had major bleeding. Protamine sulfate, tranexamic acid and/or recombinant factor VIIa were used to treat most overdoses.

Case Presentation: We report four cases of intentional dalteparin overdose involving two patients. The first patient was a 39-year-old woman who, on three separate occasions, self-injected 225,000-360,000 units of dalteparin with intent to self-harm. Peak LMWH anti-Xa levels were 7.33-10.0 U/mL with initial activated partial thromboplastin time (aPTT) >150 seconds. On two occasions, she was treated with empiric protamine sulfate with no bleeding complications and subsequent normalization of coagulation parameters (Figure 1, Panel A).

The second patient was a 42-year-old man who self-injected 225,000 units of dalteparin with intent to self-harm. Eighteen hours later, he developed left arm anterior compartment syndrome attributed to traumatic venipuncture and required urgent fasciotomy. Peak LMWH anti-Xa level was 8.94 U/mL with aPTT >150 seconds. He was treated with five doses of protamine sulfate 50mg intravenously. Serial LMWH anti-Xa levels demonstrated a transient biochemical response to protamine sulfate (Figure 1, Panel B). After recovery, he was discharged on a direct oral anticoagulant with Thrombosis and Psychiatry follow-up.

Conclusions: Pharmacokinetics and bleeding complications in LMWH overdose can be unpredictable. Our experience supports the use of empiric protamine sulfate to both prevent and treat bleeding. Serial LMWH anti-Xa activity measurements can help guide therapy. The decision to resume anticoagulation after an intentional overdose should be individualized and involve a multidisciplinary approach to discharge planning.

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28 – C Restraint Practices in Incapable Wandering Patients during COVID-19: Ethics and Best Practice Recommendations

Background: Ethical planning during pandemics incorporates the utilitarian principle of protecting the largest number of people while not placing overly burdensome restrictions on individuals. This balance of individual rights with the rights of others is particularly challenging with patient care, where patient autonomy and dignity must be protected. Incapable cognitively-impaired patients present an ethical dilemma when they are unable to follow isolation instructions, putting them at risk of contracting or spreading COVID-19.

Case: An 82-year-old man with Alzheimer's dementia is admitted to a medicine ward. He contracts COVID-19 when his ward goes into an outbreak, but before his infection is recognized he transmits the infection to several other patients through his dementia-associated wandering behaviour. He now continues to wander maskless, visit the nursing station, and enter other patient rooms as he did previously. Should restraining strategies be put in place to prevent further risk of transmission? Should consent from the Substitute Decision Maker be required prior to implementing any form of restraints?

Intervention: The medical, ethical, and legal considerations were examined. These components were weighed, and a decision tool was created with guidance from HIROC, CMPA, HHS legal counsel, the ethics department, and Best Practice Committee.

Conclusion: Clinicians caring for incapable patients who are unable to follow Infectious Prevention and Control Protocols (IPAC), who are at an increased risk of contracting or spreading COVID-19, should follow the identified structured approach to balance the ethical, legal, and medical considerations in pandemic situations

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29 – C When Stem Cells Go Awry: 8p11 Myeloproliferative Syndrome Presenting as JAK2 Negative Erythrocytosis

Background: 8p11 myeloproliferative syndrome (EMS) is a rare hematologic disease associated with translocations of the fibroblast growth receptor factor 1 (FGFR1) gene located at chromosome 8p11. Patients can present with myeloid or lymphoid hematologic malignancies. We describe a case of EMS that initially mimicked polycythemia vera.

Case: A 23-year-old male presented with an acute asthma exacerbation secondary to cat dander allergy. Blood work demonstrated severe erythrocytosis (203 g/L), leukocytosis (35.5x10^9/L) and eosinophilia (11x10^9/L). Serum erythropoietin was <3.8 mIU/mL (normal range 3.8 - 16.9 mIU/mL), with negative JAK2 and BCR-ABL mutation testing. Workup for eosinophilia revealed an elevated IgE, in keeping with asthma. He was discharged following stabilization of his respiratory status but was subsequently lost to outpatient follow-up.

He presented to hospital three months later with hematuria, and was found to be severely thrombocytopenic (2x10^9/L, previously 258x10^9/L). Physical examination revealed diffuse lymphadenopathy and splenomegaly. Intravenous immunoglobulin and high-dose corticosteroids failed to increase the platelet count, arguing against a diagnosis of immune thrombocytopenia. Peripheral blood examination showed persistent erythrocytosis, neutrophilia and eosinophilia. An inguinal lymph node biopsy showed monotonous sheets of T-lymphocytes, consistent with T-Acute Lymphoblastic Lymphoma/ Leukemia. A bone marrow biopsy subsequently showed a hypercellular marrow with myeloid hyperplasia and eosinophilia, consistent with a myeloproliferative neoplasm. Cytogenetic analysis of the bone marrow demonstrated FGFR1 gene rearrangement and a translocation at the 8p11 locus, consistent with EMS.

Conclusion: EMS is a rare clinicopathologic entity with a heterogeneous presentation that is known to mimic a variety of hematologic diseases including acute leukemia and chronic myeloid leukemia. Our case shows that it can resemble polycythemia vera early in its presentation. Allogeneic stem cell transplantation remains the only curative therapy.

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30 – C Interesting Case of A 33-Year Old Kidney Donor with a Gunshot Wound and Undiagnosed Pulmonary Hypertension

Case: This is a case report of a 33-year old man, with a history of a gunshot wound, who came forward as a potential living kidney donor for his brother. He denied any medical history. There were no concerning features on review of systems including cardiac and respiratory symptoms. A careful physical examination revealed an obvious thrill and bruit in the left femoral region at which point the potential donor acknowledged a gunshot wound to the region one year earlier. A follow-up ultrasound demonstrated a superficial femoral artery arteriovenous fistula within the left thigh, which was also demonstrated on review of a CT angiogram performed the year prior. Follow-up echocardiogram demonstrated mild pulmonary hypertension with dilated left and right atria, a dilated right ventricle and an RVSP of 45 mmHg. The patient underwent surgical repair of the AV fistula. Repeat echocardiogram less than 1 year post-repair demonstrated normal right ventricular function and size with an RVSP of 20 mmHg. The patient elected not to proceed with donation.

Conclusion: Based on his history alone, this patient would not have required an echocardiogram or an ultrasound as a part of the work-up for kidney donation, and proceeding with donation prior to repair of the fistula may have resulted in intra-operative or post-surgical complications. Therefore, this case demonstrates the importance of a careful and detailed physical examination.

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31 – C Maternal and Fetal Infection Of Non-Typhoidal Salmonella During Pregnancy

Background: Salmonella species are known to cause invasive metastatic disease following gastroenteritis. Although non-invasive Salmonella infections often do not require antibiotics, there is controversy regarding the treatment of pregnant women. We aim to review the literature and highlight our case of invasive maternal and fetal Salmonella infection.

Case: A healthy 18-year-old female at 36 weeks gestational age presented with 4 weeks of intermittent nausea and diarrhea without fever or systemic symptoms. She had no history of travel, animal exposure, nor sick family contacts. She did attend a wedding in the month prior. Her stool culture resulted Salmonella spp. and was initially given oral azithromycin. Blood cultures resulted Salmonella enterica subsp. enterica serovar Schwarzengrund and she was treated with 14 days of intravenous ceftriaxone.

She became febrile while on ceftriaxone and her baby was delivered by emergency Caesarean section for fetal tachycardia. The baby initially showed no signs of infection and was discharged without antibiotics, however was re-admitted day of life 23 with fevers, tachycardia and diarrhea. Stool cultures was positive for the same Salmonella spp. Blood culture was negative, cerebrospinal fluid was normal, and full body MRI showed no osteomyelitis. The baby was treated with ampicillin/ ceftriaxone for 14 days.

Conclusion: There are few cases of intra-amniotic Salmonella infections with good outcomes on treatment for the mothers. The fetal prognosis is worse, including fatal outcomes. There is insufficient data regarding the treatment of Salmonella infections during pregnancy. Our case demonstrates the need to identify invasive Salmonella in pregnant patients who may not present with systemic illness. Furthermore, it is not clear what specific measures to prevent neonatal infection should be taken in mothers with invasive Salmonella infections.

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32 – C Spontaneous Regression of Pseudomyogenic Hemanioendothelioma

Background: Pseudomyogenic Hemangioendothelioma is a relatively newly classified vascular tumor. It was first included in the WHO classification as an intermediate malignant vascular tumor in 2013. PMH was first reported in 1992 as a fibroma-like variant of epithelioid sarcoma (Mirra et al). PMH is more commonly seen in the young male population. Diagnosis is typically made in patients younger than 40 years of age.

Case: A 22-year-old female with a 17-month history of left knee pain was seen at our institution. After 8 months of intermittent pain originating from the patella region, the patient began to notice muscle atrophy of the thigh and calf and subsequently was imaged. A CT scan revealed numerous lytic lesions throughout the left lower limb. An open bone biopsy concluded the diagnosis of pseudomyogenic hemangioendothelioma. Ultimately the patient opted to forgo an amputation and instead pursue systemic therapy with Everolimus. However, there were delays in obtaining Everolimus due to funding barriers.

Off treatment, a repeat CT scan was arranged which revealed partial resolution of many lesions, and symptomatically the patient was experiencing less pain. The decision at this point was to pursue a watch-and-wait technique. After another 3 months, a repeat CT scan was conducted which continued to show ongoing sclerosis within a large number of osseous lesions throughout the left lower extremity.

Conclusion: There is currently little understanding of treatment for this relatively new tumor classification. However, in the case of our patient we saw that with no treatment at all, there was evidence of regression of the tumors.

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33 – C Don't blame Gordon(ae), it was Lymphoma all along

Background: Post-transplant lymphoproliferative disease (PTLD) is a heterogenous spectrum of predominantly B-cell disorders, which may be localized or widely disseminated following renal transplantation. Mycobacterium gordonae is an environmental organism that can present as nonspecific cutaneous lesions in immunocompromised hosts.

Case: We present a case of a 34 year old EBV positive patient who underwent a second renal transplant with anti-thymocyte globulin (ATG) induction. Three years post-transplant, she was found to have three cutaneous ulcerating plaque-like lesions as well as a submandibular mass. There was no accompanying fever, weight loss, fatigue or night sweats. Serum EBV PCR increased from 2,800 to 39,325 copies/ml at presentation. Culture was positive for Mycobacterium gordonae and ethambutol, azithromycin and moxifloxacin were initiated. A mononclonal gene rearrangement was detected for the T cell gamma receptor. Final pathology was consistent with CD30 positive, ALK negative anaplastic large cell lymphoma. PET scan showed hypermetabolic extranodal foci involving the skin, subcutaneous tissue and muscles.

Conclusion: Organ transplant recipients are vulnerable to develop cutaneous diseases with immunosuppressive medications increasing the risk of opportunistic infection, premalignant and malignant lesions. We present a rare case of EBV positive T-cell anaplastic large cell lymphoma that has been reported to affect 0.8 to 2.5% of renal transplant recipients. Although Mycobacterium gordonae can cause pulmonary disease, skin and soft tissue infections in immunocompromised hosts, it was ultimately found to be a non-pathogenic contaminant in this case.

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34 – C Extensive Stomatitis Caused by Herpes Simplex Virus 1 (HSV 1) in a Small Cell Lung Cancer Patient Undergoing Chemoradiotherapy: A Case Report and Literature Review

Background: Mucositis/stomatitis caused by herpes simplex virus (HSV) reactivation is well reported in hematologic malignancies undergoing myeloablative chemoradiotherapy regimens, supporting guideline recommendations of antiviral prophylaxis in seropositive patients. However, there is lacking evidence to support similar recommendations in solid tumours. We report a case of herpetic stomatitis in a lung cancer patient, and review literature on HSV infections in solid tumour patients receiving chemoradiotherapy.

Methods: A comprehensive search was conducted on all English-written articles using EMBASE and OvidMEDLINE.

Results: To date, excluding case reports, only 10 publications of HSV oral infections were found on solid tumour patients undergoing chemoradiotherapy. One RCT showed no benefit of acyclovir prophylaxis versus placebo and overall low rates of herpetic stomatitis (5%) in head-neck cancer (HNC) patients. Nine cohort studies found no correlation between HSV shedding and chemoradiotherapy-induced mucositis. However, 8 out of 9 cohort studies evaluated only HNC patients receiving one chemotherapy regimen (cisplatin). Case reports of HSV infections included encephalitis (n=40), oral/genital lesions (n=2), and other sites (n=9); chemoradiotherapy regimens used varied. Our case described a 65-year-old male with extensive-stage small cell lung cancer receiving cyclophosphamide, doxorubicin, and vincristine. After his second cycle of chemotherapy, he developed febrile neutropenia with Gram-negative bacteremia and otomastoiditis treated with antibiotics. He later developed perioral lesions with extensive stomatitis (Fig.1) which swabbed positive for HSV-1 by PCR. He was successfully treated with acyclovir followed by prophylaxis, remaining lesion-free pursuing chemotherapy.

Conclusions: HSV oral infections are not well-studied in solid tumour patients. Larger epidemiologic studies looking at specific myeloablative regimens and its risk of viral reactivation in different solid tumours are needed to better evaluate the role of antiviral prophylaxis.

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35 – C A Sticky Situation: Management of Left Atrial Appendage Thrombus Due to Atrial Fibrillation in a Patient with Quebec Platelet Disorder

Background: The Quebec platelet disorder (QPD) is an autosomal dominant bleeding disorder with a unique, platelet-dependent gain-of-function defect in fibrinolysis, due to more than a 100-fold increased urokinase plasminogen activator in gakaryocytes/platelets, without systemic fibrinolysis. QPD significantly increases risk of bleeding and fibrinolytic inhibitors are the only effective treatment. We describe the management of a patient with QPD who developed atrial fibrillation (AF) and stroke from a left atrial appendage (LAA) thrombus.

Case: An 80-year-old man with QPD presented with heart failure and new onset AF (CHA2DS2-VASc score of 4). A previous patient with QPD and AF suffered a fatal intracranial hemorrhage within months of starting anticoagulation for stroke prevention. After weighing risks and benefits, the patient decided against anticoagulation and was to be considered for a LAA occlusion device.

Weeks later, he developed slurred speech and a left facial droop. Transesophageal echocardiography revealed a large LAA thrombus suggesting that he had suffered cardioembolic strokes with hemorrhagic evolution due to QPD. His case was discussed between cardiology, hematology, neurosurgery and cardiac surgery. It was felt that the risk for further embolic events was unacceptable, therefore, a surgical approach was undertaken. With cardiopulmonary bypass, he underwent removal of LAA thrombus and suture closure of the LAA via mini-thoracotomy. Post-operatively, a combination of anticoagulation and tranexamic acid was initiated safely.

Conclusion: This case highlights challenges in managing AF in patients with bleeding disorders and the need for multidisciplinary decision making when there is a paucity of evidence.

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36 – C Treatment of Osteoporosis Related to Adult Hypophosphatasia

Background: Hypophosphatasia (HPP) is a rare, inherited disorder characterized by a deficiency of serum and bone alkaline phosphatase (ALP), leading to defective bone and teeth mineralization. Patients with adult-onset HPP often present with osteoporosis, but there is limited evidence supporting specific drug therapies.

Case Presentation: A 63-year-old Caucasian woman with osteoporosis presented with an atypical femoral fracture (AFF), on bisphosphonate therapy. Alendronate was stopped and she subsequently fractured her radius, ulna and pelvis. A workup for secondary osteoporosis led to the diagnosis of hypophosphatasia (ALP 25), with confirmatory genetic testing. She received teriparatide for two years and her bone mineral density (BMD) increased from a T-score of -3.1 to -2.5. One month following discontinuation of teriparatide, she fractured her humerus. After weighing the risk of another AFF with the prevention of future fragility fractures, she was started on denosumab. Currently she has been treated for 1 year with no new fractures and a stable BMD. We are currently exploring funding options for asfotase alfa, a human recombinant TNSALP for the treatment of HPP.

Conclusion: This case illustrates the importance of identifying hypophosphatasia as a secondary cause of osteoporosis and carefully considering osteoporosis treatment options. Bisphosphonate therapy should be avoided as it may worsen bone hypomineralization and increase the already-elevated risk of AFF in HPP patients. We suggest the use of an anabolic treatment modality (teriparatide or romosozumab) for HPP patients with a high fracture risk. These therapies are only approved for 1-2 years, after which an alternative therapy must be started to prevent loss of new bone formation. We chose denosumab as a maintenance therapy. Ongoing research is required to assess long-term safety and efficacy.

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