Introduction

In 2016, 39,782 individuals were diagnosed with HIV in the United States. According to the Center for Disease Control and Prevention, in 2016, adolescents between the ages of 13-24 represented up to 21% of all new HIV diagnoses in the country. In Broward County, 15% of all individuals living with HIV were between 13-24 years of age. In November of 2017, Broward County was ranked number two in the U.S. of newly diagnosed HIV infections.

A lack of knowledge and increased risk-taking sexual behaviors amongst today’s youth contributes to the spread of HIV. However, an increase in knowledge can alter sexual behavior within this population. Recent literature suggests that sexual education programs increase knowledge and positively influence lifestyle changes. Further insight into how specific HIV focused sexual education programs impact knowledge and risk-taking behavior may provide a template for future sexual education curriculums.

Methods

Over a one-year study, a sample of 103 individuals between 13-24 years of age in Broward County schools completed a one-hour HIV/AIDS educational session. The training session was created and delivered by representatives of the World AIDS Museum and Educational Center, located in Wilton Manors. Prior to the educational session, participants completed an HIV knowledge pre-test. At the completion of the training session, participants were re-tested on HIV knowledge post-test.

Results

To explore the unique contribution of the training session, a paired-samples t-test was conducted. Specifically, the analysis determined whether there was a statistically significant mean difference between the pre-test and post-test. There were no outliers in the data as assessed by inspection of a boxplot for values greater than 1.5 box-lengths from the edge of the box.

The assumption of normality was not violated, as assessed by Shapiro-Wilk’s test (p = .181). Participants performed better on the post-test (M = 17.39, SD = 2.11) than the pre-test (M = 15.07, SD = 2.40). The post-test elicited a statistically significant mean increase of 2.32, 95% CI [1.695, 2.946], t(102) = 7.359, p < .000. Further, as reported by Cohen (1988), results revealed a large effect, d = 0.725.

<table>
<thead>
<tr>
<th>Test</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>103</td>
<td>15.07</td>
<td>2.39</td>
<td>.2362</td>
</tr>
<tr>
<td>Post-test</td>
<td>103</td>
<td>17.38</td>
<td>2.11</td>
<td>.2079</td>
</tr>
</tbody>
</table>

Conclusion

A significant improvement of knowledge about HIV occurred when participants were exposed to the sexual education program focused on HIV. Youth may benefit from HIV educational programs to further understand HIV, HIV stigma, and the implications of HIV infection. Future research could explore the influence of HIV focused sexual education on risky sexual behavior and the likelihood of contracting HIV.

References

- U.S Census Bureau. American Community Survey 2015. Table. 20702
Breast cancer is the most common solid tumor malignancy to metastasize to the skin and occurs in up to 24% of patients. It carries a poor prognosis, emotional distress, significant decrease in quality of life, and increases the risk of infection and bleeding. Usual treatments include surgical resection and radiation after resection, but recurrence is common, requiring new treatment strategies.

Imiquimod: Topical Therapy as a Treatment for Cutaneous Metastasis: A case report

Esther G. Chong MD, Anthony Nguyen MD, Shagufa Shaheen MD, Hamid Mirshahidi MD
Loma Linda University Medical Center, Department of Medicine, Division of Hematology and Oncology, Loma Linda, CA, United States

A 50-year old African-American female was diagnosed with left DCIS in 1999. She was initially treated with left total mastectomy. Six years later, she was diagnosed with stage IV breast adenocarcinoma (ER/PR positive and HER-2 negative) with recurrence and metastasis in multiple lymph nodes. She completed chemotherapy with concurrent radiation therapy with good clinical and radiographic response. Four years after breast cancer recurrence, she noted skin hardening, pain and hyperpigmentation over her left chest wall, with increasing lymphatic masses in her left neck and left supraclavicular area. Skin biopsy showed infiltrating adenocarcinoma, ER positive, PR negative, HER-2 positive. PET-CT demonstrated cervical, supraclavicular, mediastinal and axillary lymphadenopathy with increased uptake in the left upper lung, sternum, and left chest wall consistent with breast cancer recurrence and metastasis. Despite chemotherapy, skin lesions continued to worsen with burning pain and became hard with frequent ulcerations.

To treat her metastatic skin lesions to the upper left chest wall and left supraclavicular area, she was started on topical imiquimod 5% cream to her skin lesions twice per day for 5 days a week. With imiquimod therapy, she had progressive and gradual improvement and regression of her skin lesions within 4 months. The lesions decreased in size, thickness, and pigmentation, with resolution of ulceration and pain.

Imaging and Pathology

**Background**

Breast cancer is the most common solid tumor malignancy to metastasize to the skin and occurs in up to 24% of patients. It carries a poor prognosis, emotional distress, significant decrease in quality of life, and increases the risk of infection and bleeding. Usual treatments include surgical resection and radiation after resection, but recurrence is common, requiring new treatment strategies.

**Case Presentation**

A 50-year old African-American female was diagnosed with left DCIS in 1999. She was initially treated with left total mastectomy. Six years later, she was diagnosed with stage IV breast adenocarcinoma (ER/PR positive and HER-2 negative) with recurrence and metastasis in multiple lymph nodes. She completed chemotherapy with concurrent radiation therapy with good clinical and radiographic response. Four years after breast cancer recurrence, she noted skin hardening, pain and hyperpigmentation over her left chest wall, with increasing lymphatic masses in her left neck and left supraclavicular area. Skin biopsy showed infiltrating adenocarcinoma, ER positive, PR negative, HER-2 positive. PET-CT demonstrated cervical, supraclavicular, mediastinal and axillary lymphadenopathy with increased uptake in the left upper lung, sternum, and left chest wall consistent with breast cancer recurrence and metastasis. Despite chemotherapy, skin lesions continued to worsen with burning pain and became hard with frequent ulcerations.

To treat her metastatic skin lesions to the upper left chest wall and left supraclavicular area, she was started on topical imiquimod 5% cream to her skin lesions twice per day for 5 days a week. With imiquimod therapy, she had progressive and gradual improvement and regression of her skin lesions within 4 months. The lesions decreased in size, thickness, and pigmentation, with resolution of ulceration and pain.

**Image 1:** Hypertrophic, hyperpigmented, thick plaque-like lesions over left anterior chest and left supraclavicular area, tender to palpation

**Image 2:** 2 months after starting treatment, thickness of lesions decreased

**Image 3:** 4 months after starting treatment, hypertrophic lesions resolved, leaving hypopigmented macular scars

**Image 4:** Skin of left breast with adenocarcinoma in dermis forming forming small glands and nests, compatible with breast duct origin

**Discussion**

- The regression and improvement of our patient’s skin lesions after starting imiquimod was significant
- Our case demonstrates the longest interval between initial diagnosis of the patient’s primary breast cancer and eventual cutaneous metastasis (10 years)
- There have been other reported cases of using imiquimod, a synthetic imidazoquinoline and Toll-Like receptor-7 agonist, with evidence pointing to the ability of imiquimod to induce a pro-immunogenic tumor microenvironment
- It is proposed that imiquimod creates an immune-mediated response with Interferon signaling, causing increased myeloid dendritic cell and plasmacytoid dendritic cell response, and decreased immunosuppression leading to an immune-mediated local anti-tumor response

**References**

Frailty Increases the Risk of Non-Home Discharge and Hospital Length of Stay in Elderly Patients Undergoing Elective Major Surgery

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1. Department of Medicine, Division of Internal Medicine, Hôpital Maisonneuve-Rosemont, Université de Montréal, Montreal, Canada. 2. Department of Surgery, Division of Vascular Surgery, Hôpital Maisonneuve-Rosemont, Université de Montréal, Montreal, Canada. 3. Public Health and Health Systems, University of Waterloo, Waterloo, Ontario. 4. Département de Médecine, Université de Montréal et Centre hospitalier de l’Université de Montréal, Montréal, Québec, Canada. 5. Department of Medicine, Division of Internal and Critical Care Medicine, Hôpital Maisonneuve-Rosemont, Université de Montréal, Montreal, Canada.

**Background**

- Frailty, a loss of physiological reserve, has gained interests in the past decade as predictors of adverse postoperative outcomes in elderly surgical patients.
- Frail elders increase their primary care and hospital care consumption even before the onset of disability (1).
- Identifying patients at risk of postoperative complications and trying to prevent them is the essence of preoperative evaluation.

**Hypothesis**

- Vulnerability and frailty is associated with worse postoperative outcomes.

**Methods**

- Prospective cohort study in a tertiary academic center between January 2017 and January 2018.
- A trained research assistant recruited patients over telephone before their preoperative clinic visits.
- We identified eligible patients through daily screening of the preoperative visit schedule. Patients were included if they were 65 years and older, awaiting major elective surgery and had a planned postoperative stay of 24 hours or more.
- Frailty assessment was performed by a trained assistant using the Clinical Frailty Scale via telephone interview. (2, 3)
- Frailty and vulnerability are associated with worse postoperative outcomes.
- Of the 269 survivors (2 pts died after surgery), 82.2% were discharged home, 11.2% were discharged to rehabilitation centers and 6.7% to senior residences.
- **Glomerular Filtration Rate is calculated using the CKD-EPI formula as L/min/1.73m²**
- **Table showing only significant factors. Sex, comorbidity, ASA score, surgical specialty, age were significantly associated with the duration of hospital length of stay.**

**Results**

- **Of the 269 survivors (2 pts died after surgery), 82.2% were discharged home, 11.2% were discharged to rehabilitation centers and 6.7% to senior residences.**
- 14.8% of vulnerable patients had a new transfer to post-acute care facilities compared to 2.9% of robust patients and 35.6% of frail patients (p<0.0001).
- Being vulnerable (odds ratio (OR)=5.27; CI=1.64 – 16.93) or frail (OR = 14.68; CI=4.82 – 48.12) was associated with a higher odd of a new transfer to post-acute care facilities compared to robust patients.

**Table 1. Baseline characteristics between robust, vulnerable and frail elderly patients**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Robust patients</th>
<th>Vulnerable patients</th>
<th>Frail patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, median (OR)</td>
<td>71 (67-75)</td>
<td>70 (64-74)</td>
<td>70 (65-75)</td>
</tr>
<tr>
<td>Female sex, n (%)</td>
<td>62 (44.3)</td>
<td>55 (66.7)</td>
<td>35 (69.0)</td>
</tr>
<tr>
<td>Vulnerability</td>
<td>0.35</td>
<td>0.02</td>
<td>0.002</td>
</tr>
<tr>
<td>Hypertension</td>
<td>90 (65.7)</td>
<td>68 (82.5)</td>
<td>32 (65.3)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>23 (16.4)</td>
<td>27 (33.3)</td>
<td>12 (24.5)</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>27 (19.5)</td>
<td>31 (38.3)</td>
<td>15 (30.0)</td>
</tr>
<tr>
<td>COPD</td>
<td>12 (8.7)</td>
<td>15 (18.7)</td>
<td>7 (14.0)</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>1.0 (0.7)</td>
<td>1.3 (1.3)</td>
<td>1.3 (1.3)</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td>27 (19.5)</td>
<td>35 (42.6)</td>
<td>12 (24.5)</td>
</tr>
<tr>
<td>Cancer</td>
<td>23 (16.4)</td>
<td>15 (18.7)</td>
<td>3 (6.0)</td>
</tr>
<tr>
<td>Charlson comorbidity index, median (IQR)</td>
<td>4.0 (3.0)</td>
<td>5.0 (4.0)</td>
<td>5.0 (4.0)</td>
</tr>
<tr>
<td>ASA score, n (%)</td>
<td>1.23</td>
<td>1.13</td>
<td>1.13</td>
</tr>
<tr>
<td>1</td>
<td>4 (2.9)</td>
<td>1 (1.3)</td>
<td>1 (1.3)</td>
</tr>
<tr>
<td>2</td>
<td>103 (73.2)</td>
<td>50 (62.5)</td>
<td>20 (40.0)</td>
</tr>
<tr>
<td>3</td>
<td>22 (15.5)</td>
<td>12 (15.0)</td>
<td>5 (10.0)</td>
</tr>
</tbody>
</table>

**Table 2. Postoperative outcomes between robust, vulnerable and frail elderly patients.**

<table>
<thead>
<tr>
<th>Postoperative outcomes</th>
<th>Robust patients</th>
<th>Vulnerable patients</th>
<th>Frail patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge after surgery, n (%)</td>
<td>128 (92.6)</td>
<td>68 (87.5)</td>
<td>25 (50.0)</td>
</tr>
<tr>
<td>Home</td>
<td>72 (52.2)</td>
<td>72 (90.9)</td>
<td>72 (144.0)</td>
</tr>
<tr>
<td>Senior residence</td>
<td>4 (3.0)</td>
<td>7 (9.1)</td>
<td>12 (24.5)</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>4 (3.0)</td>
<td>13 (16.7)</td>
<td>15 (30.0)</td>
</tr>
<tr>
<td>LTC facilities</td>
<td>0.0 (0.0)</td>
<td>0.0 (0.0)</td>
<td>0.0 (0.0)</td>
</tr>
<tr>
<td>New transfer to post-acute care facilities</td>
<td>4.0 (4.0)</td>
<td>30 (37.5)</td>
<td>30 (60.0)</td>
</tr>
<tr>
<td>Duration of hospital LOS</td>
<td>4.0 (4.0)</td>
<td>4.0 (4.0)</td>
<td>4.0 (4.0)</td>
</tr>
<tr>
<td>Intravenous line use</td>
<td>0.0 (0.0)</td>
<td>0.0 (0.0)</td>
<td>0.0 (0.0)</td>
</tr>
<tr>
<td>Graft failure</td>
<td>10 (7.2)</td>
<td>8 (10.6)</td>
<td>2 (4.0)</td>
</tr>
<tr>
<td>Ureteral stent</td>
<td>3 (2.3)</td>
<td>4 (5.1)</td>
<td>1 (2.0)</td>
</tr>
<tr>
<td>Unplanned reoperation</td>
<td>7 (2.5)</td>
<td>2 (2.6)</td>
<td>2 (4.0)</td>
</tr>
</tbody>
</table>

**Table 3. Multivariate logistic regression of factors associated with a new transfer to post-acute care facilities**

<table>
<thead>
<tr>
<th>Covariates</th>
<th>Odds ratio (OR)</th>
<th>CI 95%</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Frailty Scale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robust</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vulnerable</td>
<td>5.27</td>
<td>1.64 – 16.93</td>
<td>0.003</td>
</tr>
<tr>
<td>Frail</td>
<td>14.68</td>
<td>4.82 – 48.12</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Age, per year</td>
<td>1.1</td>
<td>1.03 – 1.17</td>
<td>0.006</td>
</tr>
</tbody>
</table>

**Table 4. Negative binomial regression of factors associated with duration of hospital length of stay**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Incidence Relative Ratio (IRR)</th>
<th>CI 95%</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Frailty Scale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robust</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vulnerable</td>
<td>1.77</td>
<td>1.23 – 2.55</td>
<td>0.001</td>
</tr>
<tr>
<td>Frail</td>
<td>2.55</td>
<td>1.87 – 3.47</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Age, per year</td>
<td>1.23</td>
<td>1.23 – 2.55</td>
<td>0.001</td>
</tr>
</tbody>
</table>

**Conclusions**

Vulnerable and frail elderly surgical patients suffer from adverse postoperative outcomes. The Clinical Frailty score is a simple tool that could be easily integrated in patients management before and during hospital stay to identify who is at higher risk.

**References**


**Funding** This work was supported by research grant obtained from the Canadian Frailty Network (Strategic Impact Grant: SIG2014F-31).
**Case Presentation**

We present an 86 year old male with a known history of transitional cell carcinoma in situ treated with rifampin and isoniazid. Patient remains in follow-up.

**Imaging**

**Figure 1:** Kyphosis with a compression fracture of the T2 vertebral body with sclerosis & mild compression deformity. There are also severe compression deformities of the T10 and T12 levels with extensive endplate irregularities.

**Figure 2:** Lymphocytic infiltrate, scattered multinucleated cells, calcification, and necrosis. Ziehl-Neelsen acid-fast stain demonstrated acid-fast bacilli.

**Discussion**

We now know BCG induced osteomyelitis is a rare, but serious systemic complication of intravesical BCG therapy. Other deleterious systemic complications include spondylodiscitis, mycotic aortic aneurysm, spondylodiscitis, and septic joints. Others like pulmonary tuberculosis Infections, lymphocytic meningitis, arthritis, and tubulointerstitial nephritis also have been reported. It is thought spreads via the Batson’s paravertebral venous plexus.

One of the more challenging aspects of BCG related complications is the inability to identify the M. Bovis source of the underlying infection given its presentation, rarity, low pathogenicity, and presence in tissue. Thus, PCR and molecular techniques is the test of choice. Risk factors include trauma to the urothelial tissue. These could manifest as a result of TURBT, pre-existing UTI, bladder catheterization, or any comorbid condition that could cause hematuria.

**Discussion (continued)**

However, in a single center retrospective study, we could not ascertain an obvious predictor for developing BCG related infection post treatment. The risk factors reviewed during the study included: time from transurethral surgery, number of prior BCG instillations, comorbidities, history of tuberculosis, and immunosuppression.

Despite its effectiveness, cost and toxicities have presented challenges. Several trials have tried to reduce BCG doses to alleviate toxicities while maintaining the same level of effectiveness. To-date these meta-analyses have been inconsistent in their results and the optimal dose remains controversial.

**Conclusion**

Mycobacterium bovis osteomyelitis is a rare complication of intravesical BCG therapy. Further multi-center retrospective analyses are needed to better ascertain its true risks given its increasing utilization. Additional analysis also are needed regarding dosing regimens, titration, and duration.

**Bibliography**

Spontaneous Regression of an High Grade Diffuse Large B-Cell Lymphoma of the Liver
Yi Jiang, MD1, Victor Chang, MD2, Donghong Cai, MD3, Michael Cook, DO4, Mirela Feurdean, MD1

Department of Medicine, Rutgers New Jersey Medical School, Newark, New Jersey1
Department of Medicine, Section of Hematology/Oncology2, Department of Pathology3, Department of Nuclear Medicine4, VA New Jersey Health Care System, East Orange, New Jersey

BACKGROUND

Spontaneous regression (SR) of cancer is a condition characterized by partial or complete disappearance of a malignant tumor in the absence of treatment or in the presence of therapy considered inadequate. Although not uncommon in low-grade lymphoma, SR of diffuse large B cell lymphoma (DLBCL) is extremely rare. Here we report a unique case of untreated DLBCL of liver with spontaneous remission.

CASE PRESENTATION

A 64-year-old man with history of chronic hepatitis C virus (HCV) infection presented to the Emergency Department for a 2 week history of right upper quadrant abdominal pain. Workup led to triple phase abdominal computed tomography (CT) that showed a 6 cm right hepatic mass and borderline lymphadenopathy. Liver core biopsy pathology showed diffuse large B cell lymphoma CD20 and BCL6 positive, with Ki-67 greater than 90%.

Further staging work up with bone marrow exam and positron emission tomography (PET) CT confirmed stage IVA DLBCL, not otherwise specified (NOS) with high-grade histologic features limited to the liver. Based on the International Prognosis Index system, patient was considered to be in the high-intermediate risk group.

The patient’s treatment was delayed and a PET CT scan repeated at 3 months from initial diagnosis in preparation for treatment showed partial regression of the liver lesion with eventual complete resolution of the hypermetabolic status. The patient continues to do well.

DISCUSSION

In previous case reports, the majority of cases of SR were for DLBCL located in head/neck, breast and stomach. Patients with primary high grade lymphoma of the liver have a poor prognosis.

Liver mass core biopsy histopathological findings:

c. Hematoxylin-eosin staining showed core tissue is diffusely infiltrated by a population of medium to large sized atypical lymphocytes with vesicular chromatin and prominent nucleoli.

d. Immuno-histological studies showed these lymphocytes are positive for CD20.

e. Ki-67 proliferative index for these atypical lymphocytes is more than 90%.

CONCLUSIONS

• This case demonstrated a SR of primary liver DLBCL with aggressive clinical and histopathologic features.
• This observation suggests immune mechanisms can be important in affecting the outcomes of high grade lymphoma.
• Uncovering the underlying mechanism of SR may shed light on new therapeutic strategies to improve outcomes for future patients.
Introduction

- Implementation of the electronic medical record (EMR) in both outpatient and inpatient settings has demonstrated increased safety, patient care, and cost benefits to health systems that have utilized the EMR effectively.  
- In the outpatient setting, effective EMR use has demonstrated reductions in adverse drug events and increased use of evidenced based recommendations for preventive care.
- For hospital systems utilizing the EMR effectively, over a fifteen-year period, potential savings for these systems could reach a combined total of nearly $371 billion.
- The use of template-guided notes has been associated with improved billing data, decreased clinic visit time, and increased physician satisfaction.
- The Summa Internal Medicine Clinic (IMC) is a resident-based primary care clinic that utilizes an EMR to serve its large, diverse, urban population of patients
- Note completion times vary drastically among IMC residents which decreases the steady reimbursement rate amongst billable visits.
- Administrative data has consistently shown the need for the IMC to improve note completion time.
- The purpose of this quality improvement (QI) project was to implement and evaluate a standardized note template (SNT) for use in the IMC.

Methods: Setting and Intervention

- Summa IMC – Internal Medicine (IM) residency based primary care clinic - large, diverse, urban population with numerous barriers to care - 64 IM and Transitional year (TH) residents on a rotating basis - Attending physicians, nurse practitioners, clinical pharmacists and social workers
- July 2017 – Creation and implementation of SNTs for provider use at all visits
- Two SNTs were created based on the two most common work patterns and the flow of the clinic - Problem based assessment and plan note template - Free text note template
- Standardized 10-point review of systems and physical exam template
- Goal: Reducing overall note completion time while increasing the proportion of notes completed in 24 hours

Results

Table 1. Characteristics associated with SNT use in the IMC

<table>
<thead>
<tr>
<th>SNT Use</th>
<th>Total (n=8019)</th>
<th>PGY1 (n=1700)</th>
<th>PGY2 (n=1867)</th>
<th>PGY3 (n=2557)</th>
<th>Faculty (n=1895)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note completion time (hours), mean (SD)</td>
<td>11.3 (40.6)</td>
<td>19.2 (50.3)</td>
<td>26.7 (67.1)</td>
<td>15.4 (49.5)</td>
<td>19.0 (54.7)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Completed within 24h, no. (%)</td>
<td>82 (4.6)</td>
<td>1763 (22.0)</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provider experience, no. (%)</td>
<td>38.9 (2.0)</td>
<td>5.2 (2.1)</td>
<td>5.4 (1.9)</td>
<td>4.9 (2.4)</td>
<td>4.8 (2.2)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 2. Characteristics associated with IMC provider status

<table>
<thead>
<tr>
<th>SNT Use</th>
<th>Total (n=8019)</th>
<th>PGY1 (n=1700)</th>
<th>PGY2 (n=1867)</th>
<th>PGY3 (n=2557)</th>
<th>Faculty (n=1895)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note completion time (hours), mean (SD)</td>
<td>1310 (77.1)</td>
<td>224 (12.0)</td>
<td>141 (6.5)</td>
<td>82 (4.6)</td>
<td>1763 (22.0)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Completed within 24h, no. (%)</td>
<td>1155 (91.5)</td>
<td>1551 (83.1)</td>
<td>1954 (76.4)</td>
<td>1660 (87.6)</td>
<td>6720 (83.8)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Patients per shift, mean (SD)</td>
<td>3.8 (2.0)</td>
<td>5.0 (2.1)</td>
<td>5.4 (1.9)</td>
<td>4.9 (2.4)</td>
<td>4.8 (2.2)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 3. Adjusted change in note completion time

<table>
<thead>
<tr>
<th>Δ in note completion time</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNT use</td>
<td>-0.6</td>
<td>-14.6,-13.4</td>
</tr>
<tr>
<td>Patients per shift</td>
<td>6.1</td>
<td>0.3,1.3</td>
</tr>
<tr>
<td>Provider Status</td>
<td>PGY1</td>
<td>0.5, 1.0</td>
</tr>
<tr>
<td>PGY2</td>
<td>1.0, 1.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>PGY3</td>
<td>5.1, 10.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Faculty</td>
<td>Ref.</td>
<td>Ref.</td>
</tr>
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</table>

Table 4. Adjusted odds of note completion ≥24h

<table>
<thead>
<tr>
<th>SNT use</th>
<th>Odds Ratio (OR)</th>
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Conclusion

- The SNTs utilized in the IMC have demonstrated effectiveness in:
  - Decreasing the amount of time for a note to be completed (on average nearly 11 hours controlling for other factors)
  - Increasing the likelihood of completing notes within a 24 hour period
- Potential benefits of improved note completion time:
  - More accurate billing with higher billable levels of reimbursement with use of a templated note
  - Improving efficiency in patient care within the IMC
- Limitations
  - Retrospective study with results potentially impacted by factors not measured
  - Inability to directly track the impact on patient care
- Future studies
  - Investigating correlation between decreased note completion times and resident wellness
  - Studying improving use amongst residency classes

Methods: Measures

- Primary Outcomes:
  - Overall note completion time and proportion of notes completed within 24 hours
- Assessment and Data Analysis:
  - Data collected from July 2017-January 2018
  - Primary independent variable: Usage of SNT (y/n)
  - Time from note opening to completion was evaluated for each visit along with usage of the SNT
  - Mean note completion time and proportion of notes completed in 24 hours were compared for visits that did and did not use the SNT
  - Independent samples t-tests and one-way ANOVA to compare means
  - Pearson’s chi-squared tests to compare proportions
  - Multivariable regression models to control for confounding from other factors

References


Acknowledgment

Nick Naro, MD
Kamal Dayal, MD
An Uncommon Cerebrovascular Pattern of Stroke in an Asian patient

Ronan Hsieh, MD¹, Jessica Stempel Velasco, MD¹, Saman Zafar, MD², Akanksha Agrawal, MD³, Pradhum Ram, MD³, Jorge Penalver, MD¹, Andres Mora, MD¹, Mario Naranjo, MD¹

¹Department of Medicine, Einstein Medical Center, Philadelphia, PA. ²Department of Neurology, Einstein Medical Center, Philadelphia, PA.

Case Presentation
A 34-year-old Asian woman presented with confusion, progressive right upper and lower extremity weakness and paresthesia for four days, as well as easy forgetfulness and ambulatory dysfunction for one year.

Past Medical History: anxiety, hyperthyroidism, HTN
Past Family History: Unknown (adopted child)
Social History: no tobacco, alcohol or illicit drug use
Review of Systems: no fever, no chills, no neck rigidity, no recent trauma or vision changes

Vitals: Heart rate 82, blood pressure 153/101, afebrile

Physical examination:
- General: Alert and oriented to person/time/place
- HEENT: NC/AT, EOMI, PERRLA, no nystagmus, vision 20/20 (OU), intact visual field
- NE: intact high cortical function, no dysmetria, no dysarthria, no facial asymmetry, right arm/leg strength 4/5, left arm/leg strength 5/5, diminished sensation to crude touch and vibration on right side, normal reflex, Babinski sign downward, slightly unstable gait

Medications: Methimazole, alprazolam PRN

National Institutes of Health Stroke Scale: 3

Laboratory data:

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Urine drug test: positive for opiates and cocaine

ECG: Normal sinus rhythm

CT head without contrast

- Age-indeterminate stroke in the left parietal
- Chronic stroke in the left frontal region

Cerebral angiogram

- High-grade stenosis with abrupt cut-off at bilateral ACA, MCA, PCA near the skull base
- Prominent collaterals along the course of lenticulostriae

Hospital Course
Patient was diagnosed of having Moyamoya disease. After stabilization, patient was discharged with outpatient evaluation for internal carotid artery-external carotid artery bypass surgery.

Case Discussion: Moyamoya disease

Characteristics
- Bilateral arterial stenosis around the Circle of Willis
- Prominent collaterals

Genetics
- Substitution of RNF213 gene on chromosome 17q25.3
- Autosomal dominant

Pathophysicsiology
- Increased Fibroblast growth factor
- Fibrocellular thickening of the intima

Prevalence
3.2-10.5/100,000 (Japan)

Risk factor
- Asians (OR >2)
- Women (OR 1.8-2.2)
- Teenagers (10-14), middle age (40-49)

Presentation
- Ischemic stroke or TIA (outside Japan)
- Hemorrhagic stroke, sudden death (Japan)
- Headache
- Seizures

Staging
- Suzuki stages (6 stages)

Diagnosis
- Classic stroke up includes CT and MRI.
- Gold standard: angiogram

Treatment
- Hyperacute stroke management
- Aspirin is recommended (?) benefits
- Thrombolitics are controversial
- Revascularization surgery:
  - Indication: cognitive decline, symptom progression or low cerebral flow
  - Superficial temporal artery or middle meningeal artery to MCA
  - Improved cerebral flow (87%)
  - No risk reduction of recurrent stroke (no surgery vs. surgery: 10% vs. 9%)
  - No curative treatment

Prognosis
- Cognitive decline in 50%-66% of patients

Prevention of stroke
- No treatments for asymptomatic patients
- Oral anticoagulants are contraindicated

Screening
- Not recommended
Introduction

Lymphomatosis Cerebri is a rare variant of Primary CNS Lymphoma with less than 50 reported cases. Its clinical and radiographic presentation is not suggestive of malignancy, which enables it to be misdiagnosed as other infectious or inflammatory conditions and evade diagnosis. Our patient presented with rhombencephalitis. Rhombencephalitis has a broad differential diagnosis. Less than 5% of cases of rhombencephalitis are attributed to lymphoma.

Clinical Timeline

A 62 year old woman with minimal past medical contact was transferred to our institution with rhombencephalitis.

Months prior to presentation (in retrospect)

- Fatigue, hearing loss, memory loss, new snoring, ataxia.
- Laboratory Studies

Laboratory Studies

Initial laboratory studies at our institution were significant for:

- Leukocytosis (12 x 10^9/L).
- Elevated C-Reactive Protein (28.5 mg/L).
- Elevated lactic dehydrogenase (752 U/L).
- Elevated normal 1,25-dihydroxy vitamin D (25 pg/mL) (ref 25-65 pg/mL).
- Elevated C-Reactive Protein (28.5 mg/L).

There was an exhaustive list of serum and CSF studies (exploring infectious and autonomic diagnoses) were negative.

Hospital Course

The differential diagnosis for rhombencephalitis was broad. Initially our patient’s immunocompetence, flu-like prodrome, and exclusive infratentorial involvement was suspicious for Leukoencephalopathy and Behcet’s disease, but this was not clinically consistent.

Neuropathological Results

The pathological diagnosis was Diffuse Large B-cell Lymphoma (DLBCL), CD-20 positive, CD-10 negative, CD-5 negative, and Cyclin D1 negative. A & B: Two low power microphotographs showing diffuse large B-cell lymphoma with high mitotic activity and pleomorphism. C: Immunohistochemistry with CD-3. Weakly positive staining in a minority of tumor cells. D: Immunohistochemistry with CD-20. Strongly positive consistent with DLBCL. E: Immunohistochemistry with Mib-1. Strongly positive consistent with high grade proliferation.

Conclusion

- Lymphomatosis Cerebri (LC) is a rare variant of Primary CNS Lymphoma (PCNSL) which can masquerade as non-malignant infectious and inflammatory conditions and thereby evade diagnosis.
- Negative CSF studies (even via repeated lumbar punctures) are not enough to exclude malignancy. 72% of patients with LC have negative CSF.
- In contrast to classic PCNSL, the majority of patients with LC present with cognitive decline, gait disturbance, and no focal symptoms. Patients with classic PCNSL have more seizures, headaches, and focal symptoms compared to patients with LC.
- Initial presentation of LC may be indistinguishable from other infectious or inflammatory conditions on MRI. In contrast to classic PCNSL, LC is a diffuse, confluent lesion with bilateral hemispheric involvement, absent or minimal contrast enhancement, and variable restricted diffusion.

References


Acknowledgements

- Stephen Heavey, MD
- Hangi Bosh, MD
- Deanna Williams, BA

Neurological Exam

- Apple pie and I-apparing
- Mild right-sided facial droop
- Nystagmus
- A non-abducting right eye
- Poor finger-to-nose coordination on the right side
- Dysarthric and graviol speech
We present an unusual presentation of an aggressive chest wall epithelioid sarcoma in a young adult male with normal chest radiography two months prior.

**INTRODUCTION**

The views expressed in this work are those of the authors and do not reflect the official policy or position of the department of the Army, Navy, Air Force, Department of Defense, or the United States Government.

**CASE PRESENTATION**

27yo male presents with two months of left-sided chest/shoulder/back pain
- Prior negative ED workups → normal CXR (Figure A)
- ROS: Pleuritic chest pain, exacerbated by movement, + fever/chills, night sweats, hemoptysis for two weeks
- Vitals: tachycardia (104 bpm) and febrile (100.8°F)
- Exam: diaphoretic young male, intermittent cough with bloody sputum, left chest wall tenderness
- Labs: leukocytosis (17.2k)
- Chest X-ray: New large (8cm) left apical mass (Figure B)
- CT chest: left upper chest, pleural-based lesion with extra-pleural invasion of fat and third rib (Figure C,D)
- Infectious etiologies suspected based on rapid growth.
  - Broad spectrum antibiotics initiated
  - Bronchoscopy failed to identify source of bleeding.
  - No improvement with antibiotic therapy
  - CT-guided biopsy performed
    - Prelim pathology: poorly differentiated malignant cells
  - Thoracotomy with wedge resection aborted due to near total left upper lobe encasement, chest wall invasion and diaphragm metastases.
  - Received chemotherapy for presumed SCLC
    - Minimal response following 3 cycles of carboplatin + etoposide

**DIAGNOSIS**

Pathology was reassessed. Initial specimens were weakly positive for INI-1; however, repeat specimens confirmed the absence of INI-1, which significantly altered the patient’s diagnosis, treatment and overall prognosis.

**CONCLUSIONS**

- Pathology was reassessed. Initial specimens were weakly positive for INI-1; however, repeat specimens confirmed the absence of INI-1, which significantly altered the patient’s diagnosis, treatment and overall prognosis.
- Final diagnosis: Metastatic INI-1 deleted undifferentiated pleomorphic sarcoma, likely epithelioid sarcoma.
  - Started AIM (doxorubicin + ifosfamide +mesna)
  - Referred to Sarcoma Alliance cancer center

Epithelioid sarcoma (ES) account for <1% of adult malignant tumors. ES can be sub-classified into proximal (PES) and distal (DES).
- PES occur in young to middle-aged males and arise in the head, neck, trunk, pelvis and perineum. PES are aggressive and have a worse prognosis than DES.
- Diagnosis: Core needle biopsy which demonstrates epithelioid cells with large vesicular nuclei in sheet-like pattern. Immunohistochemical stains express vimentin, EMA (epithelial membrane antigen) and CD34. 90% of ES have an inactivation of INI-1 (tumor suppressor gene).
- Treatment: Radical resection with adjuvant chemotherapy (AIM) and radiotherapy.
- Prognosis: Early metastases and a large primary unresectable tumor have a poor prognosis. Recurrence rates and metastatic potential are very high. Overall 5-year survival is 50%.

• This case's unusually aggressive presentation initially triggered infectious management; however, histology confirmed a rare undifferentiated pleomorphic sarcoma consistent with epithelioid sarcoma.
• Even more unusual was the tumor involvement of the chest wall. A literature review revealed six prior cases of chest wall ES, including this case.
• This dramatic case of rapidly progressive epithelioid sarcoma discovered in a previously healthy young male highlights a rare but significant diagnosis that unfortunately carries a poor prognosis.

*References available upon request*

A Rare Case of Epithelioid Sarcoma

Amy Stacey, DO, Capt, USAF, MC; Amanda Bilko, MD; Divya Indrakanti & Thomas Murphy, MD

Dept. of Internal Medicine, Wright Patterson Air Force Base, Wright State University Boonshoft School of Medicine, Dayton, Ohio.
Multicentric Castleman’s Disease in the Uncontrolled Diabetic

Jessica Chambers, MD
The University of Texas at Austin, Department of Internal Medicine

Introduction

Castleman Disease is a lymphoproliferative disorder with a diverse array of well-documented associations, most notably human immunodeficiency virus (HIV) and human herpesvirus 8 (HHV-8). It may present as either unicentric or multicentric distribution of disease. Although rare, the mortality from untreated multicentric disease is high, especially in those with autoimmune dysregulation. The disease is often caught late in its progression.

Case Presentation

A 33 year old male with uncontrolled type II diabetes was admitted to the hospital one evening for an asthma exacerbation. While his respiratory status resolved quickly with proper treatment, he asks why he has so many “lumps” all over his body. On questioning he admits he has lost 75 pounds in the past few months without trying, complains of significant night sweats, and notes he has not been treating his diabetes appropriately for over a year due to treatment fatigue. On exam he is cachectic, diaphoretic, and tachycardic with nontender lymphadenopathy of the anterior and posterior cervical chains, as well as the axillary, epitrochlear, and femoral regions bilaterally.

Work Up

Laboratory studies were notable for a moderately elevated ESR and LDH, as well as a fasting blood glucose level of over 600 mg/dL without ketones in the serum or urine. A1C level was greater than 14. HIV testing was negative. Serum protein electrophoresis showed a faint monoclonal protein in the alpha-2 region and a polyclonal increase in gamma globulins. Imaging revealed diffusely prominent intrathoracic and inguinal lymph nodes over 1 centimeter in diameter. Excisional biopsy of the left inguinal lymph node exhibited follicles with frequently atretic germinal centers containing prominent hyalinized vessels. Immunohistochemistry was negative for human herpesvirus 8 (HHV-8). Interleukin-6 (IL-6) levels by multiplex bead assay were undetectable.

Discussion

The salient point in this case is the onset of multicentric lymphoproliferative disease in the setting of significant glucose toxicity. Multicentric Castleman disease also has a well-described association with another constellation of symptoms called POEMS syndrome (Polyneuropathy, Organomegaly, Endocrinopathy, Monoclonal gammopathy, and Skin or bone changes). It is probable this patient’s presentation is a variant of POEMS syndrome, with endocrinopathy manifesting as severe insulin resistance. Even more compelling is the evidence that glucose control may prevent the progression of disease in this patient. This adds to the growing body of literature suggesting autoimmune dysregulation as an important, and possibly unrecognized, complication of uncontrolled diabetes.

References


Pathology

Pathology demonstrating typical features of Castleman Disease with hyalinized vessels and lymphoproliferative changes.

Clinical Course

The patient was in the hospital for one week, during which time his glucose was aggressively controlled. His lymphadenopathy objectively decreased in size and his fatigue was resolved. At the time he was seen in primary care clinic weeks later, he had self-discontinued all of his oral diabetic medications and insulin. His disease appeared to have progressed, and his malaise had worsened. He reluctantly agreed to restart his medication regimen at a less aggressive level. He is currently undergoing rituximab infusions under the direction of hematology-oncology.

Pathology demonstrating typical features of Castleman Disease with hyalinized vessels and lymphoproliferative changes.
Type 5: A Rare MODY Operandi
CPT Zachary Bloomer, MD, MAJ Roy Guinto, DO, FACP, LTC Ian Rivera, MD, FASN
Dwight D. Eisenhower Army Medical Center, Fort Gordon, Georgia

Case Presentation

- A 33 year-old male
- 8 year history of poorly controlled diabetes on Metformin/Sitagliptin
  - A1c: 10.4%
- Incidentally noted pancreatic atrophy and cystic renal disease on CT
- On examination
  - Vitals were unremarkable
  - Tall thin man with BMI of 22
- Family history
  - Paternal uncle with diabetes

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<td>Glutamine Decarboxylase Ab</td>
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- Genetic evaluation
  - Duplication in DNA sequence on chromosome 17
  - Heterozygous frameshift mutation in hepato-nuclear transcription factor 1β
- Initiated on weight based Glargine
  - Decrease in A1c from 10.4% to 6.8%

MRI of Pancreatic Atrophy

MRI of Bilateral Renal Cysts

Discussion

- Diabetes is a very common disease in America affecting >30% of adults
- 90% are due to type 2 diabetes
- Maturity onset diabetes of the young accounts for 2-5% of cases
- Class triad includes:
  - Non-ketotic diabetes
  - Diagnosis prior to age 25
  - Strong family history of diabetes
- Hyperglycemia originates from genetic mutations in 6 possible genes
  - Leads to impaired glucose sensing and decreased insulin secretion
- 80% of cases are due to mutations in HNF-1α (MODY3) and Glucokinase (MODY2)
  - MODY5 results from HNF-1β mutation
  - Causes <5% of MODY cases
- Unique characteristics include:
  - Diabetes prior to age 25
  - Renal cysts and chronic kidney disease
  - Internal genito-urinary malformations
  - Hepatopathy
  - Intestinal abnormalities
- Excellent response to exogenous insulin administration and oral hypoglycemic (ex: Sulfonylureas)

The views expressed in this presentation are those of the authors and do not necessarily reflect the official policy of the Department of Defense, Department of the Army, US Army Medical Department or the US Government.
A Rare Case of Myocarditis Secondary to an Occult Malignancy
Aneesh Dhore MD1, Amit Arbune MD2, Khalil Murad MD MS1, Ashish Aneja MD1
1. Heart and Vascular Institute, MetroHealth Medical Center, Case Western Reserve University, Cleveland, Ohio
2. Heart and Vascular Center, Yale New Haven Hospital, New Haven, Connecticut

Background
- Eosinophilic myocarditis (EM) is a relatively rare condition that may result from hypereosinophilic syndromes (HES). It manifests clinically with acute heart failure, cardiogenic shock, cardiac arrhythmia, or cardio-embolic events.
- Renal cell carcinoma (RCC) is a rare cause of HES.
- To the best of our knowledge there has been no reported case of EM secondary to HES in a patient with renal cell carcinoma. In this report, we present a case of EM in a patient with HES secondary to RCC.

Initial Presentation
- This is a 61-year-old man with a history of hypertension and asthma who presented to the emergency department with 3-week history of progressive pleuritic and sharp chest and back pain for over 3 weeks, and nearly 50 lb weight loss over the preceding 4 months.
- He does not smoke or uses recreational drugs, but consumes occasionally. He has no family history of malignancy.

Initial Workup
- Peak Troponin T: 35.3 ug/L
- B-Natriuretic Peptide Levels: 522 pg/ml
- Peripheral smear: Marked Eosinophilia
- IgE level: >2000 IU/ml
- Tryptase level: 7
- ANA, Hepatitis panel, HIV, Strongyloides titers: Negative
- FISH Negative for PDGFRα, PDGFRβ and FGFR1
- Bone Marrow Biopsy: Hyper cellular Bone Marrow with Marked Eosinophilia; Negative for Malignancy
- Computed tomography of Abd/Pelvis: Enhancing mass projecting off the upper pole of the right kidney, highly suspicious for renal carcinoma

Cardiology Workup:
- Electrocardiogram (not shown): ST depressions in V4, V5, V6
- Transthoracic Echocardiogram (not shown): globally reduced left ventricular (LV) systolic function with an ejection fraction of 40%
- Coronary Angiography (not shown): Tortuous coronary arteries c/w hypertension. No evidence of atherosclerosis, dissection (SCAD), spasm or occluded vessel/branch.
- Cardiac magnetic resonance imaging: 1A and B – T2 weighted STIR imaging in the short axis projection showing diffuse increase in signal suggestive of edema/inflammation
  1C and D: Delayed post-Gadolinium imaging in the LV outflow tract and vertical long-axis projections showing diffuse subendocardial and patchy myocardial gadolinium uptake, consistent with subendocardial fibrosis and likely inflammation.

Management and Case Resolution
- Endomyocardial biopsy was deferred because of typical clinical presentation and findings on laboratory and imaging studies.
- In addition to guideline-directed medical therapy for systolic heart failure, high dose corticosteroid therapy was initiated early and resulted in significant drop in eosinophils count within 3 days. Corticosteroids therapy was tapered within 4 months with sustained resolution of hyper-eosinophilia.
- Prophylactic oral anticoagulation to reduce left ventricular (LV) thrombosis was also initiated.
- Surgical resection of the renal mass was subsequently performed.

Discussion
- EM is a serious complication of HES and can be associated with an underlying malignancy.
- Early initiation of corticosteroids therapy is standard in HES but not in EM. In our case the early administration of corticosteroids may have been instrumental in patients overall outcome.
- LV thrombosis can be seen in up to 28.6% of patients with HES and EM and decision to anti-coagulate is critical in the early recovery phase. Yet evidence to support benefit of anticoagulation remains lacking.
HINTS to a Diagnosis of Multiple Sclerosis

D. Bourgeois MD, R. Thibodaux MD
Department of Internal Medicine - Louisiana State University Health Sciences Center, Baton Rouge, LA

Background

- Vertigo is the illusion of movement usually accompanied by nystagmus and distressing symptoms such as nausea, vomiting, pallor and postural instability.
- Vertigo is typically characterized as central or peripheral, with the former having significant associated morbidity.
- Multiple sclerosis is an autoimmune disorder of the central nervous system causing inflammatory damage to the brain, spinal cord, and optic nerve.
- Vertigo occurs in up to 50% of patients with MS at some point during the disease; however it is most often BPPV, a peripheral etiology.

Case Report

- 30-year-old female with hypertension, scoliosis, and obesity presented with several hours of acute vertigo, nausea and vomiting.
- She noted a brief episode of vertigo with nausea and vomiting earlier in the day with sitting up but denied any headache, changes in vision, weakness or numbness, hearing loss, tinnitus, or recent URI.
- A few months prior, she was evaluated by ENT for decreased hearing and right ear fullness and diagnosed with eustachian tube dysfunction.
- Also at that same time, she was seeing PT for LLE weakness and numbness which was attributed to her scoliosis.
- Exam on presentation revealed no focal motor or sensory deficits.
- HINTS exam revealed normal head impulse along with gaze changing nystagmus which was consistent with central vestibular dysfunction.
- MRI of the brain, cervical, and thoracic regions suggested multiple foci of active demyelination.
- Lumbar puncture revealed >5 oligoclonal bands in CSF.
- As a result, she was diagnosed with MS and her symptoms resolved after receiving 3 days of pulse dose steroids.

Discussion

- A central etiology of vertigo due to demyelination in vestibular pathways is the presenting symptom of MS in only 5% of cases.
- HINTS (head impulse, gaze-changing nystagmus, test of skew) is a simple bedside maneuver which has been validated as an excellent tool to differentiate central from peripheral etiologies of acute vestibular syndrome when performed in the first 72 hours of presentation.
- A normal head impulse test (HIT), gaze changing nystagmus, or identification of skew deviation is highly suggestive of a central etiology of Acute Vestibular Syndrome (AVS).
- A positive head impulse test can still represent a central process with vestibular nucleus or root entry zone involvement and with infarcts involving the anterior inferior cerebellar artery (AICA) territory causing labyrinthine ischemia.
- The HINTS test has been found to be better than MRI in first 48 hours in diagnosing stroke in AVS and may be predictive of an acute demyelination process in a patient with an initial negative MRI study.

Conclusion

- The HINTS exam along with additional history, CNS MRI, and LP confirmed a new diagnosis of MS in a 30 y/o female who had been evaluated at different points in times for symptoms related to Multiple Sclerosis.
- The HINTS exam is a valuable but underutilized tool in discriminating central from peripheral etiologies in patients presenting with an acute vestibular syndrome, especially in the ED.

References

1. MKSAP 18
Extensive DVT in a 31-Year-Old Female on Oral Contraceptives Diagnosed with May-Thurner Syndrome
Erik Calderon, MD, Brent Duran, DO, Stephanie Pankow, DO

Introduction
May-Thurner Syndrome is a rare but important diagnosis in a small percentage of new DVT diagnoses. Prevalence is approximated to be 2-5% of the causes of symptomatic DVT’s with high risk of recurrence. Risk factors include female gender, post-partum, and OCP’s.

Case Description
A 31-year-old post-partum female presented with left lower extremity pain and swelling of one-day duration. She had started OCP’s 3 weeks prior to presentation. Ultrasound showed extensive thrombus throughout the left lower extremity venous system involving the popliteal to the common femoral veins with extension into the external iliac vein. Anticoagulation initiated and catheter-directed TPA treatment to her left lower extremity and was found to have a chronically occluded inferior vena cava with a large clot burden.

Discussion/Conclusion
May-Thurner Syndrome, aka iliac vein compression syndrome, is an extrinsic venous compression by the arterial system against bony structures in the iliocaval venous territory. Although uncommon, it is important to differentiate May-Thurner Syndrome as a cause of deep venous thrombosis as the treatment modalities and long term anticoagulation may differ.

References
Pylephlebitis presenting as FUO
Philip Kanemo, Mariam Saand, Sabena Ramsetty
Department of Medicine, Englewood Hospital and Medical Center Affiliated with Hackensack Meridian School of Medicine at Seton Hall University.

INTRODUCTION
Pylephlebitis, infective suppurative thrombosis of the portal vein, is typically associated with intraabdominal infections. It is often characterized by fever, abdominal pain, and polymicrobial bacteremia. We present a case of pylephlebitis presenting as indolent fever of unknown origin (FUO).

CASE PRESENTATION
An 82-year-old man with diabetes presented with a four-month history of fevers, drenching night sweats, thirty-pound weight loss, and vague right-sided abdominal pain. Outpatient CBC and chemistries were unremarkable, blood cultures were negative, and CT scan of chest and abdomen without contrast revealed possible lung infiltrates. His last colonoscopy at age 52 was normal. He denied travel, sick contacts or tick exposures. Patient received one week of Levofoxacin for possible pneumonia with no clinical improvement. He was admitted for further workup.

On admission he appeared weak and diaphoretic. He was febrile to 100.5F. Physical exam was only remarkable for mild right upper quadrant tenderness. Labs revealed leukocytosis of 14.74 k/ul, hemoglobin 10.6 g/dl and platelets 250 k/ul. Electrolytes and liver function tests were normal. Gallium scan was ordered and was non-diagnostic. CT abdomen/pelvis was repeated with contrast revealing extensive portal vein thrombosis. Hypercoagulable workup was negative. Fusobacterium was isolated from one of five sets of blood cultures drawn during hospitalization. Metronidazole was started and patient defervesced within 48 hours. He was discharged home with 6 weeks of oral Metronidazole as well as anticoagulation.

DISCUSSION
Pylephlebitis is a rare but serious condition which may complicate intra-abdominal conditions including diverticulitis, appendicitis, peritonitis, and rarely Crohn's disease. It can be life threatening if it goes undiagnosed. Fusobacterium is a slow growing anaerobe, and there are several reported cases documenting its association with thrombophlebitis of the portal vein as well as internal jugular vein thrombophlebitis (Lemierre's syndrome). The organism itself is thought to have thrombogenic properties. Management of pylephlebitis typically involves a prolonged course of pathogen-targeted antimicrobials in addition to several months of anticoagulation.

CONCLUSION
Pylephlebitis should be considered in cases of FUO presenting with vague abdominal pain. Our case illustrates the importance of contrast imaging of the abdomen/pelvis when evaluating a patient for FUO. This should be done before nuclear imaging or invasive diagnostic tests. We also emphasize the importance of obtaining multiple blood cultures in efforts to isolate fastidious organisms such as Fusobacterium.

References
Diagnostic Accuracy of a Smartphone-based Atrial Fibrillation Detection Algorithm

Isma Nusrat Javed MD, Nazir Ahmad MD, David Albert MD, Stavros Stavrakis MD, PhD
University of Oklahoma Health Sciences Center 1 & 4, Saint Anthony Hospital 2, Alive Cor Inc 3

BACKGROUND

- Smartphone-based single-lead ECG devices have enhanced the feasibility of diagnosis and monitoring of arrhythmias, including atrial fibrillation (AF).
- The Kardia mobile ECG device is an FDA approved smartphone-based, single lead device, with an automated algorithm to detect AF, based on RR irregularity and absence of P waves.

METHODS

- Twenty nine patients with paroxysmal AF and low CHADS2-VASc score were instructed to transmit a 30-second ECG every day and when experiencing symptoms for a median period of 20 months.
- The ECGs were transmitted to a secure server and the diagnosis was manually confirmed by 2 physicians.
- The sensitivity and specificity of the automated algorithm for the diagnosis of AF were compared against the physician interpretation as the gold standard.

RESULTS

- Over a median follow up of 20 months, 20 patients failed to submit a daily ECG at least once (median 3 failed submissions).
- A total of 14,998 ECGs were recorded. AF was diagnosed in 715 (5%) ECGs, while 1549 (10%) were deemed undetermined by the device.
- Overall, the kappa coefficient of agreement was 0.89 (95% confidence intervals 0.86 to 0.91; p<0.0001), indicating excellent agreement between the 2 methods.
- The device had a 99% sensitivity and 98% specificity for diagnosing AF (Table 1).
- When the undetermined ECGs were treated as possible AF in the analysis, the specificity dropped to 88%, while the sensitivity was maintained at 99%.

Table 1: Sensitivity and specificity of Kardia AF algorithm against physician interpretation as the gold standard

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<td>14140</td>
<td>14156</td>
</tr>
<tr>
<td>Total</td>
<td>715</td>
<td>14283</td>
<td>14998</td>
</tr>
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Table 2: Sensitivity and specificity of Kardia AF algorithm against physician interpretation as the gold standard, when the undetermined ECGs were treated as AF in the analysis

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<td>6</td>
<td>715</td>
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<tr>
<td>No</td>
<td>1760</td>
<td>12523</td>
<td>14283</td>
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<tr>
<td>Total</td>
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<td>12529</td>
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CONCLUSIONS

- The Kardia mobile ECG device provides excellent diagnostic accuracy in diagnosing AF, supporting the notion that such a device can be used for AF screening.
- In this setting, a high sensitivity in diagnosing AF will allow physicians to review only those recordings that are classified by the device as AF, in order to decrease the burden of having to review every transmitted ECG recording.
- The diagnostic accuracy of this single lead ECG device is critically dependent on high-quality signals. Thus, efforts should be directed towards patient education to acquire high-quality signals to optimize the performance of the device.
When Statins Attack: A Case of Necrotizing Autoimmune Myopathy

Puja Jadav, MD; Stephanie Shieh, MD

Department of Neurology, Saint Louis University School of Medicine, Saint Louis, MO

A 58-year-old African American man with PMH cervical spondylosis s/p surgical intervention 2013, radiculopathy, DM2, presented with lower extremity swelling and progressive proximal weakness following a fall one month prior whereby his legs “gave out”.

He had recently been started on atorvastatin approximately 1 year ago, which had initially been discontinued previously for muscle spasms then deemed unrelated to his weakness.

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Improving PPI prescribing practices in an academic safety-net primary care: quality improvement project

Naren Nallapeta MD, Usman Yousaf and Smita Bakhai MD, MPH
Department of Medicine, Jacobs School of Medicine and Biomedical Sciences, University at Buffalo

Purpose of Study

Aim
To reduce the percentage of patients inappropriately prescribed PPIs between the ages of 40-75 years from a baseline rate of 80% to less than 60% within 12 months in academic, Internal Medicine Safety-net Clinic at Erie County Medical Center

Background
• Overuse of PPIs continues despite evidence based guidelines
• Prolonged PPI use poses various adverse effects

Relevance to IMC:
• Patients on chronic PPI average 4-5 years; 30% inappropriate
• Increasing PPI compliance can potentially decrease risk of adverse effects and healthcare cost

Methods

Patient population: Underserved, African Americans and minorities
• STEEP model of Institute of Medicine, Plan Do Study Act (PDSA) Model
• Root cause analysis
• Electronic patient registry
• Monthly Statistical Process Control (SPC) and run charts

Identification of Barriers:
System, provider and patient-based barriers identified through monthly team meetings
QI team included nursing and ancillary staff, residents, attending physicians, social worker and GI staff

Strategy
Outcome measures:
• Percentage of patients inappropriately prescribed PPIs

Process measures:
• Percentage of patients on PPI who have their dyspepsia assessed during the clinic including alarm symptoms
• Esophagogastroduodenoscopy (EGD) completion rate

Balancing measures:
• Increase in patient wait time in the clinic
• Less access to EGD

Results

• Average rates of PPI discontinuation were 51.1% (n=92/180), resulting into 30.0% inappropriate chronic PPI use from the baseline rates of 80% within 1 year.
• We observed monthly sustainable variations with a median of 30.6% in EGD completion rates of less than 20%.

Interventions

PDSA Cycle 1 - Creation of Customized EHR template (Jan 2018)
• Redesigned nursing workflow to alert physicians to review chronic PPI use
• GERD HPI to remind physicians to evaluate alarm symptoms
• PPI risk assessment tool incorporation into EMR

PDSA Cycle 2 – Provider Education (February - April 2018)
• PowerPoint presentation with small group discussion for residents and, physicians review of AGA 2017 guidelines
• Pre test and post test assessments
• Review of workflow with nursing staff

PDSA Cycle 3 – Tracking COC visits and Medication Reconciliation (May 2018 - July 2018)
• Tracking number of visits with continuity of care (COC) Primary Care Resident Provider
• Medication reconciliation for all patients including hospital discharge patients

PDSA Cycle 4 – Patient education (August 2018 - October 2018)
• Education pamphlets, booklets and brochures for patients about GERD
• Lifestyle modification for Dyspepsia
• Feedback to stakeholders and reflection

PDSA Cycle 5 – Assess barriers and response to discontinuation (November 2018 - December 2018)
• Assessing barriers to discontinuation and response to PPI

PDSA Cycle 6 – Pocket guides for physicians (Jan 2019 -March 2019)
• Creation of Pocket cards for providers with the dyspepsia workflow and side effects of prolonged PPI use

Conclusion

• We exceeded the goal, achieved ~50% reduction in inappropriate use of chronic PPI use within 1 year.
• Lack of automated medical decision support tool was identified as the biggest barrier.
• Optimization of EHR and education to QI team members were crucial for the success of this QI.

Limitations and Lessons Learned

• Results cannot be generalized to different settings
• Some patients were unaware of the reason for taking chronic PPI and physicians were able to discontinue, while some patients were resistant to taper and discontinue PPI

Future Directions

• Enhance patient engagement using educational videos , ensure sustainability and spread to other clinics.

References

Susanna M. Wallerstedt, Johan Fastbom, Johannes Linke, Sigurd Veits, Long-term use of proton pump inhibitors and prevalence of disease- and drug-related reasons for gastroscopy in a cross-sectional population-based study, Pharmacology & Drug Safety, 2017, 26, 1, 9

Vincenzo Savaino, Pietro Duobello, Nicola de Bortoli, Andrea Ottonello, Edoardo Savaino, The appropriate use of proton pump inhibitors (PPIs): Need for a reappraisal, European Journal of Internal Medicine, 2017, 37, 19

Acknowledgment:

We would like to thank the ECMC IT department and clinic staff for their continued support.
Awards: Calkins Research Fellowship – University at Buffalo
What Happened?: Utilizing feedback as a mechanism to improve resident event reporting rates

Grant A Turner MD, Kristin Lohr MD, Robert B Jones Jr,MD, Emma Lundsmith MD, Megan Margiotta MD, Riti Kanesa-thasan MD, Bracken Babula MD, & Rebecca Jaffe MD
Thomas Jefferson University Hospitals, Housestaff Quality and Safety Leadership Council

Abstract

Introduction: Medical errors are responsible for significant patient morbidity and mortality and, as a result, increasing voluntary reporting of such events is a priority of the Institute of Medicine (IOM). In line with this, since its founding in 2015, the Housestaff Quality and Safety Committee (HQSLC) at Thomas Jefferson University Hospital (TJUH) has worked to educate housestaff on the value of event reporting. Despite this, event reports entered by housestaff has remained stagnant at ~3%.

Underreporting by housestaff is a common problem in teaching hospitals across the US. Proposed reasons for this include fear of blame and victimization, uncertainty about what should be reported and lack of feedback on an incident has been reported (Jasti et al. 2009). A previous survey of housestaff at TJUH found that only 27% of respondents felt the culture for reporting errors was supportive and non-punitive, but only 27% had received feedback on an event they had reported. We hypothesized that improving feedback on event reports would improve rate of housestaff reporting.

Methods: Housestaff event reports at TJUH entered in a 3 month period were confidentially reviewed by the HQSLC. A standardized form was adapted to provide structured feedback to the reporter on timeliness, clarity, objectivity and professionalism of the report. Information on actions taken to address the event was supplied when available. Feedback forms were reviewed by Risk Management prior to distribution back to the reporter via secure email. Recipients were asked to complete a brief survey. Quality of feedback was rated on average 3.8 on a Likert scale (1 = not useful, 5 = very useful). 67% of residents felt that there was an adequate institutional response to their report. During the studied time period, percent of event reports placed by housestaff increased to 4.5%.

Conclusion: We successfully demonstrated that providing structured feedback on event reports submitted by housestaff helps to promote further housestaff event reporting. While further work needs to be done to streamline this process, it serves as a framework to encourage greater rates of event reporting by housestaff.

Results

Objectives

- Provide feedback to 100% of residents entering a report between December 2017 and March 2018
- Evaluate the degree to which residents value the feedback
- Assess sustainability of a pilot process

Methods

- A standardized form was adapted (Figure 1) to provide structured feedback on elements of the report, including timelines, clarity, objectivity and professionalism
- Details as to actions taken at local or institutional levels to address the event were included when available
- If follow up actions were not reportable due to ongoing investigation, standardized phrases were used to assure reporters that follow up was ongoing
- Feedback forms were reviewed by Risk Management prior to sending to the reporter
- Reporters were surveyed regarding their satisfaction with the process
- After feedback was provided, each reporter was asked to complete a brief survey (completion rate 20%)

Conclusions/Future Directions

Challenges

- HQSLC member buy-in for completing forms
- Time commitment for both form completion and risk management investigation
- Investigations may not result in actions anticipated by the reporter
- Medical/legal limitations outside scope of HQSLC

Intermediate Solutions

- Use standardized language to reduce administrative burden
- Use specific peer protection language to address legal concerns

Future Directions

- Investigate other modalities of providing feedback: Phone, in person conferences, peer to peer
- Collaboration with other institutions who have successfully provided feedback to reporters

Special Thanks

Risk Management Office – Maria Wilson, Marge Slattery
Subcommittee on Event Reporting – Justine Blum MD, Matt Bokhari MD, Adam Johnson MD, Robert “Ben” Jones MD, Emma Lundsmith MD

References

Background
- Some studies suggested that clinical diagnosis of fibromyalgia is inaccurate and does not reflect current definitions.
- However, this hypothesis has not been tested in the community. We examined whether fibromyalgia was accurately diagnosed in the community and whether diagnosis was biased by sex.

Methods
- We surveyed 3276 consecutive patients attending 25 primary care practices in Kansas.
- A self-report questionnaire contained the 2016 modification of the American College of Rheumatology diagnostic criteria to determine current fibromyalgia status by criteria (CritFM).
- We also determined whether the patient had a physician’s diagnosis of fibromyalgia (MDFM), the level of fibromyalgia symptom severity as measured by the polysymptomatic distress scale (PSD), time from MDFM diagnosis, and the use of fibromyalgia pharmacotherapy.

Results
- Prevalence of physician (MDFM) and criteria (CritFM) diagnosed fibromyalgia was 6.1% (95% CI 5.3%, 6.9%) and 5.5% (95% CI 4.8%, 6.3%), respectively.
- 32.2% with MDFM met 2016 criteria (CritFM), and 35.4% with CritFM also had MDFM.
- The kappa statistic for diagnostic agreement was 0.296 (minimal agreement).
- The mean PSD score was 12.4 and 18.4 in MDFM and CritFM, and generalized pain was present in 39.7% and 100%, respectively.
- The odds ratio for being a woman was 3.2 (95% CI 2.2, 4.9) for MDFM versus 1.9 (95% CI 1.4, 2.8) for CritFM, p = 0.023.
- Treatment was related to PSD score in MDFM, even in those who did not meet criteria; 68.3% of patients with MDFM received specific fibromyalgia pharmacotherapy.

Conclusions
- There is little agreement between MDFM and CritFM.
- Physician diagnosis compared with CritFM is biased and more likely in women.
- Overall, diagnosis of fibromyalgia by physicians appears idiosyncratic and unrelated to FM criteria.
- Patients who don’t meet criteria are likely to be treated if given a diagnosis by the physician likely resulting in underestimation of real benefit and concern for unnecessary side effects.
- There appears to be no common definition of fibromyalgia in the community.

Figure 1. The distribution of PSD scores in all patients (solid line) and those diagnosed with fibromyalgia by criteria (dashed line) and physician diagnosis (dotted line).

Characteristics of Study Participants by Diagnostic Group

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<th>MD Dx</th>
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<th>WPI</th>
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<td>3.7</td>
<td>(2.9)</td>
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<td>2016 Dx</td>
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<td>100</td>
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<td>18.4</td>
<td>(4.4)</td>
<td>10.4</td>
<td>(3.5)</td>
<td>7.9</td>
<td>(2.0)</td>
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<td>96.9</td>
<td>100</td>
<td>76.6</td>
<td>35.9</td>
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</table>

References
# Metformin-Associated Lactic Acidosis after NSAID-Induced Acute Kidney Injury

Edgar Zamora, MD; Tarek Hassouna, MD; and Silpa Kosuri, MD

1. Introduction

- Metformin is an oral biguanide commonly used in the treatment of type 2 diabetes mellitus. Its use is contraindicated in patients with decreased glomerular filtration rate (GFR), in part due to a higher risk for lactic acidosis. This side-effect however, is exceedingly rare in patients with normal renal and hepatic function.

- Similarly, non-steroidal anti-inflammatory drugs (NSAIDS) are considered safe in patients with normal renal function, while they are known to decrease GFR and renal blood flow in patients with underlying diabetic nephropathy.

- We present a female patient with a long history of type 2 diabetes and metformin use, with a baseline serum creatinine level of 0.8 mg/dL, who was prescribed NSAIDs at another institution after minor trauma and successively developed acute kidney injury and severe metformin-associated lactic acidosis.

2. Case description

- An 82-year-old female with type 2 diabetes mellitus taking metformin 1000 mg twice a day and lisinopril 20 mg daily, presented to our institution complaining of severe nausea and vomits for the previous 4-5 days.

- The patient presented lethargy and shortness of breath. Her blood pressure was 75/58 mmHg. Arterial blood gas examination showed a pH of 6.7, serum bicarbonate 7 mEq/L, pCO2 21 mmHg, and anion gap 37.7. Initial blood work revealed creatinine 6.1 mg/dL, hemoglobin 14.7 g/dL and lactic acid 5.8 mmol/L.

- Despite fluid resuscitation, she became progressively hypotensive and developed acute hypoxic respiratory failure. She required orotracheal intubation and vasopressor medications. Additional history revealed a minor motor vehicle accident 13 days prior to consultation, after which she was prescribed ibuprofen 800 mg every 6 hours.

- She was admitted to the intensive care unit for supportive care, where her clinical status improved within 5 days of discontinuing NSAIDs and metformin.

3. Laboratories

<table>
<thead>
<tr>
<th>Test (units)</th>
<th>Reference Range</th>
<th>Presentation</th>
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<th>5th day</th>
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<tr>
<td>Creatinine Kinase (U/L)</td>
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<td>579</td>
<td>3,479</td>
<td>1,682</td>
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<tr>
<td>Lactic acid (mmol/L)</td>
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<td>5.8</td>
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<td>1.0</td>
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<td>Blood glucose (mg/dL)</td>
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<td>pO2 (mmHg)</td>
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<td>229</td>
<td>101</td>
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<tr>
<td>HCO3 (MMOL)</td>
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<td>--</td>
<td>9</td>
<td>17.2</td>
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<tr>
<td>Anion gap</td>
<td>8 – 16</td>
<td>37.7</td>
<td>26</td>
<td>15</td>
</tr>
</tbody>
</table>

4. Discussion

- The patient started taking high-dose ibuprofen and shortly thereafter developed acute kidney injury, possibly due to increased susceptibility to nephrotoxic medications from occult diabetic nephropathy. Consequently, her metformin clearance decreased causing lactate accumulation and severe metabolic acidosis. On admission, her home medications were discontinued, which improved her clinical status. Her lactic acid and creatinine steadily normalized.

5. Conclusions

- While NSAIDS have no influence in GFR for patients with normal renal function, patients with underlying diabetic nephropathy, have increased susceptibility to NSAIDs and a single dose of ibuprofen reduces GFR and RBF.(1-7)

- Patients with a long-standing diabetes mellitus have increased vulnerability to nephrotoxic drugs. Avoiding NSAIDS or prescribing lower dosages for patients with long-standing diabetes mellitus will decrease the risk of acute kidney injury.(1-7)
Metformin-Associated Lactic Acidosis after NSAID-Induced Acute Kidney Injury
Edgar Zamora, MD; Tarek Hassouna, MD; and Silpa Kosuri, MD
UPMC Pinnacle

1. Introduction

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<tr>
<th>ABG values (units)</th>
<th>Reference Range</th>
<th>On presentation (2L/02 NC)</th>
<th>After intubation (PRVC)</th>
<th>2nd day (PRVC)</th>
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<tr>
<td>pH</td>
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<tr>
<td>pO2 (mmHg)</td>
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<td>229</td>
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<tr>
<td>HCO3 (MMOL)</td>
<td>22 – 29</td>
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<td>9</td>
<td>17.2</td>
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<tr>
<td>Anion gap</td>
<td>8 – 16</td>
<td>37.7</td>
<td>26</td>
<td>15</td>
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</tbody>
</table>

4. Discussion

- The patient started taking high-dose ibuprofen and shortly thereafter developed acute kidney injury, possibly due to increased susceptibility to nephrotoxic medications from occult diabetic nephropathy. Consequently, her metformin clearance decreased causing lactate accumulation and severe metabolic acidosis. On admission, her home medications were discontinued, which improved her clinical status. Her lactic acid and creatinine steadily normalized.

5. Conclusions

- While NSAIDS have no influence in GFR for patients with normal renal function, patients with underlying diabetic nephropathy, have increased susceptibility to NSAIDs and a single dose of ibuprofen reduces GFR and RBF.(1-7)

- Patients with a long-standing diabetes mellitus have increased vulnerability to nephrotoxic drugs. Avoiding NSAIDs or prescribing lower dosages for patients with long-standing diabetes mellitus will decrease the risk of acute kidney injury.(1-7)
**Idiopathic Hypereosinophilic Syndrome Presenting with Recurrent Ascites**

**Ni Mo, D.O.; Stanley A. Amundson, M.D.**
Scripps Mercy Hospital | San Diego, CA

**Introduction**

- Hypereosinophilic syndrome (HES) is a group of clinical syndromes characterized by hypereosinophilia (absolute eosinophil count >1500/mcl) and evidence of end-organ injury attributable to eosinophilia.
- Some forms of HES have identifiable etiologies, but up to 75% of cases have undefined causes.

**Case Presentation**

A 48-year-old Iraqi female presented to the emergency room with several weeks of abdominal pain, bloating, and early satiety. She experienced similar symptoms in 2006 while in Iraq, but eventually resolved spontaneously. Symptoms recurred in 2013 after immigrating to USA, where she had a paracentesis done for ascites, but no specific etiology was identified.

Physical exam was notable for a moderately distended abdomen with shifting dullness on percussion. Laboratory data was significant for leukocytosis with hypereosinophilia. CT abdomen showed diffuse thickening of distal stomach with mild abdominal ascites. EGD revealed grossly normal findings with no eosinophils or parasites seen on biopsy. An extensive workup was conducted by infectious disease specialist, including strongyloides, schistosoma, and stool ova & parasite, and was negative. Ultimately, patient was discharged on an empiric course of albendazole and ivermectin.

Patient was re-admitted one week later with worsening abdominal distension and dyspnea. Laboratory data showed persistent hypereosinophilia with new onset troponinemia. Repeat CT abdomen showed diffuse small bowel thickening with large amount of ascites. Acscitic fluid analysis revealed SAAG 0.5 and WBC count 5320/mcl with 93% eosinophils. Echocardiogram was normal. Cardiac MRI showed a slight subepicardial signal enhancement. Bone marrow biopsy revealed hypercellular marrow with 45% eosinophils, but negative for malignancy or myeloproliferative chromosomal abnormalities.

She was treated with high dose methylprednisolone, which resulted in rapid resolution of eosinophilia and improvement of symptoms.

**Molecular Biology and Cytogenetics**

- Platelet-derived growth factor receptor A (PDGFR A): negative
- PDGFR B: negative
- Fibroblast growth factor receptor 1 (FGFR1): negative
- BCR-ABL1: negative
- JAK2 V617F: negative
- T cell receptor: no clonal rearrangement
- ANCA: <1:20
- Tryptase: normal
- IgE, IgA, IgM: normal
- IgE: 128 IU/mL (normal <88 IU/mL)
- IL-5: 7 pg/mL (normal <5 pg/mL)

**Radiographic and Microscopic Findings**

- **Figure 1.** MRI ascites on CT Abdomen during first hospitalization (yellow arrows)
- **Figure 2.** Repeat CT one week later showing progression of ascites (red arrows)
- **Figure 3.** Cytology of ascitic fluid demonstrating marked eosinophilia
- **Figure 4.** Bone marrow biopsy demonstrating hypercellular marrow with eosinophilia

**Discussion**

- The true prevalence of HES is unknown, but is estimated to be 0.6 to 6.3 per 100,000.
- Common organs involved in HES are dermatologic, pulmonary, gastrointestinal, cardiac, and neurologic.
- Diagnosis of HES should be considered if there is persistent peripheral hypereosinophilia (HE) or if there is evidence of tissue HE (>20% eosinophils in bone marrow sample).
- Our patient mostly likely had idiopathic HES with gastrointestinal and cardiac involvements.
- The recurrent ascites with diffuse stomach and small bowel wall thickening seen on imaging was consistent with suberosal eosinophilic gastroenteritis. Insufficient depth of biopsy may have accounted for the normal pathology results.
- Our patient’s cardiac MRI also showed a slight subepicardial signal enhancement at the inferior septum, which may be compatible with subclinical myocarditis in setting of troponinemia.
- Though no specific etiology was identified for our patient’s eosinophilia, she improved remarkably with high dose steroids.
- She continued to have regular outpatient follow-up, and remained in remission at 8 months after hospitalization.

**References**

Introduction

Takotsubo Cardiomyopathy (TC) was first documented in the 1990s in Japan as a reversible cardiomyopathy often observed in post-menopausal women after a recent emotional stress. Apical ballooning in the left ventricle is the classic echocardiographic observation. We present a rare case of a male patient with mid-cavitary variant of TC.

Case Description

A 63-year-old male presented to the emergency department after assault during which he was punched in the head and choked for 20 seconds. During the choking episode he was severely lightheaded, although never lost consciousness. Upon arrival, the patient complained of pleuritic, non-radiating chest pain. Initial troponin was elevated at 0.432 and eventually peaked at 2.05 six hours later. There were no changes on electrocardiogram and patient was admitted concerning for a Non-ST elevation myocardial infarction. Echocardiography showed ejection fraction of 40-45%. Eventually the patient underwent a coronary angiogram which demonstrated normal coronaries but mid-anterior and inferior LV akinesis and ballooning pattern consistent with the mid-cavitary variant of TC. The patient was managed with supportive care, receiving a beta-blocker and ace-inhibitor. On outpatient follow up at 1 month from index event, a repeat echocardiogram showed EF recovery (55-60%) with no wall motion abnormality.

Discussion

- Takotsubo Cardiomyopathy is a reversible form of cardiomyopathy seen in up to 2% of patients who have signs and symptoms of ACS. It is characterized by left ventricular systolic dysfunction and a pattern of ‘ballooning’ on left heart catheterization and/or echocardiography in absence of significant attributable coronary artery disease.
- A study of 1750 patients with TC, 90% of patients were women and over 80% were apical variant.
- The mid-ventricular variant with apical sparing, as demonstrated in our patient, was seen in less than 15% of patients.
- Other uncommon types of Takotsubo are basal, focal, and global variants.
- The exact mechanism for TC is unknown but widely accepted hypotheses revolve around a surge in catecholamines after physical or emotional stress which may lead to microvascular spasm causing myocardial stunning or direct myocardial toxicity.
- This case highlights that in the setting of chest pain following physical assault, although common things such as fractured ribs, contusion, dissection need to be ruled out; it is also important to evaluate for potential cardiac etiology of the pain.

References

Effectiveness of Fecal Immunochemical Testing as the Primary Screening Tool for Colorectal Cancer in an Ambulatory Care Clinic for the Underinsured and Uninsured

Maurice Marcuard, MD; Edward Oldfield IV, MD; David Mendel, MS4; Sami Tahhan, MD; David Johnson, MD
Internal Medicine, Eastern Virginia Medical School, Norfolk, VA

Introduction

The US MultiSociety Task Force (USMSTF) guidelines for colorectal cancer (CRC) screening recommend either colonoscopy or annual fecal immunochemical testing (FIT) as the only 1st tier screening methodologies.[1] As a result, the Sentara Ambulatory Care Center (ACC) for the underinsured and uninsured has replaced CT colonography with FIT testing as the preferred screening test. Importantly, the effectiveness of FIT testing is dependent on the quality of the FIT screening program and the ability to follow up positive tests with colonoscopy. This project analyzed the effectiveness of our FIT testing program at the ACC during the initial year of implementation in accordance with key quality metrics outlined by the USMSTF guidelines [2] including:

1. FIT completion rate to those offered testing of 60% or greater
2. Proportion returning FIT that cannot be processed by the laboratory of less than 5%
3. Colonoscopy completion rate for those with a positive FIT of 80% or greater

Methods

• Retrospective quality improvement project
• Information was obtained by chart review during the initial year of testing (9/1/2016-8/31/2017) and during a year of follow up (9/1/2017-8/31/2018) for all patients ordered a FIT test
• Patients with a negative FIT test were reviewed during the second year to see if they completed a repeat FIT test
• Patients with a positive FIT test were reviewed to determine their dates for initial appointment with the colonoscopy clinic, scheduled, and actual colonoscopy dates

Results

A total of 308 patients had a FIT test ordered during the study period:
• 26 were positive, 230 were negative, and 52 were incomplete (Figure 1)
• Overall FIT completion rate was 83.1%
• The colonoscopy completion rate for positive FIT tests was 65.4% (Figure 2)
• 100% of patients with a positive FIT test had appointments in the colonoscopy clinic
• For negative results- only 18% of patients completed a follow up FIT test during the second year
• Of all FIT tests, only 0.7% could not be processed due to lab error

Figure 1: FIT Test Results

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive FIT</td>
<td>50 (16.2%)</td>
</tr>
<tr>
<td>Negative FIT</td>
<td>260 (84.8%)</td>
</tr>
<tr>
<td>Incomplete FIT</td>
<td>20 (7.2%)</td>
</tr>
<tr>
<td>Lab Error</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Figure 2: Positive FIT Outcomes

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appointment Scheduled</td>
<td>2 (100%)</td>
</tr>
<tr>
<td>Colonoscopy Scheduled</td>
<td>15 (75%)</td>
</tr>
<tr>
<td>Colonoscopy Completed</td>
<td>17 (65%)</td>
</tr>
</tbody>
</table>

Conclusion

• We found a successful adoption of FIT testing for CRC screening with respect to initial completion rate of 83.1% and a lab error of only 0.7%
• All patients with a positive FIT test had an appointment scheduled with colonoscopy clinic
• We failed to meet the goal colonoscopy completion rate (65.4% vs >80%). This was predominately due to cancelled or no-showed colonoscopies without rescheduling
• Repeat FIT testing for Year 2 was only 18%
• These results highlight a need to improve colonoscopy completion rates among patients with positive FIT tests and compliance with repeat annual FIT testing for negative FIT tests especially in this high risk population
• To address these deficiencies, we need to explore sustainable programs and navigational tools which lead to improvement in testing to increase compliance with both outcomes

References


Statin-associated Necrotizing Autoimmune Myopathy (NAM): Sore Muscles and a Painful Memory

Radowan Elnair MD | Joseph Fanciullo MD

Department of Internal Medicine, University of South Dakota Sanford School of Medicine

Introduction:
An estimated 39.2 million Americans are on a statin. Statins may cause muscle-related symptoms in 10 to 20% of patients, but these symptoms usually resolve within weeks after the medication is stopped. Autoimmune myositis is rare, with an estimated prevalence of 22 in 100,000 and statin-induced Necrotizing Autoimmune Myositis (NAM) is rarer still. Symptoms include muscle weakness and myalgia, although more profound muscle weakness with respiratory failure can also occur. Marked elevation in CK is characteristic.

Case Presentation:
A 77-year-old female with a history of Hyperlipidemia (on Atorvastatin therapy) developed progressive diffuse muscle weakness over the course of a year.

ROS:
- She had no myalgias, skin rash, dysphagia, Raynaud’s phenomenon, shortness of breath, or neuropathic pain.

Past History:
In addition to hyperlipidemia, she had a remote history of smoking over 30 years ago and carried no significant history of adverse reactions with immunosuppression; she elected for management with an expectant approach.

Physical examination:
- She had a history of diabetes and vitamin D deficiency. She had a remote history of HMGCR antibody testing were consistent with a diagnosis of statin-induced NAM.
- CT of the abdomen and pelvis revealed no evidence of malignancy.

Take Home Messages:
- Overall, up to 20% of patients will develop statin related myalgias. The pathophysiology of NAM is poorly understood.
- The condition tends to respond favorably to treatment, with improvement in muscle strength and reduction of CK levels.
- In most cases, anti-HMGCR levels do not return to the normal range even in those who have clinical remission.

Work-up and Disease Course:
- Initial evaluation by her primary care physician showed an elevated CK level. This led to discontinuation of atorvastatin, however CK levels failed to normalize, which warranted further workup.
- Testing for 3-hydroxy-3-methylglutaryl-coenzyme A Reductase (HMGCR) antibodies was positive.
- CT of the abdomen and pelvis revealed no evidence of malignancy.
- She agreed to be evaluated by rheumatology approximately 1 year after discontinuation of atorvastatin. At the time, she showed no limitation in her activities of daily living. Labs are demonstrated in the table (1). Given the constellation of symptoms and laboratory findings, skeletal muscle biopsy was recommended. A tissue sample from the left proximal thigh showed ongoing mild necrotizing myopathic changes, without evidence of myositis.
- The findings along with history of positive HMGCR antibody testing were consistent with a diagnosis of statin-induced NAM.
- Given her age and the potential for serious adverse reactions with immunosuppression; she elected for management with an expectant approach.
- She continues to have an elevated CK level over the course of a year.

Case Presentation:
- Initial evaluation by her primary care physician showed an elevated CK level. This led to discontinuation of atorvastatin, however CK levels failed to normalize, which warranted further workup.
- Testing for 3-hydroxy-3-methylglutaryl-coenzyme A Reductase (HMGCR) antibodies was positive.
- CT of the abdomen and pelvis revealed no evidence of malignancy.
- She agreed to be evaluated by rheumatology approximately 1 year after discontinuation of atorvastatin. At the time, she showed no limitation in her activities of daily living. Labs are demonstrated in the table (1). Given the constellation of symptoms and laboratory findings, skeletal muscle biopsy was recommended. A tissue sample from the left proximal thigh showed ongoing mild necrotizing myopathic changes, without evidence of myositis.
- The findings along with history of positive HMGCR antibody testing were consistent with a diagnosis of statin-induced NAM.
- Given her age and the potential for serious adverse reactions with immunosuppression; she elected for management with an expectant approach.
- She continues to have an elevated CK level over the course of a year.

Take Home Messages:
- Overall, up to 20% of patients will develop statin related myalgias. The pathophysiology of NAM is poorly understood.
- Nearly all patients with statin-induced NAM will have positive anti-HMGCR antibodies, which are absent in most patients with self-limited statin myopathy or in healthy controls.
- Along with avoidance of all statins, immunosuppression is often needed and is usually given in the form of corticosteroids initially, followed by longer-term systemic immunosuppression.
- The condition tends to respond favorably to treatment, with improvement in muscle strength and reduction of CK levels.
- In most cases, anti-HMGCR levels do not return to the normal range even in those who have clinical remission.
- Longer-term management of hypercholesterolemia remains a challenge in patients who have suffered from statin-induced NAM.

References:

Table 1: Laboratory values at the initial Rheumatology clinic visit:

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<th>Reference</th>
<th>Patient’s Lab Value</th>
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<td>Calcium (mEq/L)</td>
<td>8.6-10.3</td>
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<tr>
<td>ALT (U/L)</td>
<td>0-34</td>
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<tr>
<td>Alkaline phosphatase (U/L)</td>
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<td>Total Bilirubin (mg/dL)</td>
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<td>HgA1c (%)</td>
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<tr>
<td>Glucose (mg/dL)</td>
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<td>Total protein (g/dL)</td>
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Triple versus Dual Inhaler Therapy in Moderate-to-Severe COPD: A Meta-analysis of Randomized Controlled Trials

Yazan Zayed MD1; Mahmoud Barbarawi MD1; Babikir Kheiri MD1; Tarek Haykal MD1; Adam Chahine MD1; Laith Rashdan MD1; Kewan Hamid MD1; Saira Sundus MD1; Momen Banifadel MD2; Ahmed Aburahma MD1; Ghassan Bachuwa MD1; Arul Chandran MD3.

1 Department of Internal Medicine, Hurley Medical Center, Michigan State University, Flint, Michigan United Stated
2 Internal Medicine Department, University of Toledo, Toledo, Ohio, United States
3 Pulmonary and Critical Care Department, Hurley Medical Center, Michigan State University, Flint, Michigan, United States.

INTRODUCTION

The management of chronic obstructive pulmonary disease (COPD) is rapidly evolving, especially with triple-inhaler therapy. We aimed to perform a meta-analysis to ascertain the safety and efficacy of triple-inhaler therapy consisting of an inhaled glucocorticoid (ICS), a long-acting muscarinic antagonist (LAMA), and a long-acting β2 agonist (LABA) when compared with dual-inhalers consisting of ICS/LABA or LAMA/LABA.

METHODS

We performed an electronic database search to include randomized controlled trials (RCTs) comparing between triple and dual inhalers. Pooled rate-ratio (RR) or odds-ratio (OR) for dichotomous data and weighted mean difference (MD) for continuous data were calculated with their corresponding 95% confidence interval (CI). Sensitivity analysis based on triple inhaler device (single or separate) and duration of treatment (< or ≥ 24 weeks), in addition to meta-regression analysis based on study-level covariates were also performed.

RESULTS

Additionally, triple therapy caused significant increase in trough FEV1 (MD 0.09 L; 95% CI 0.07-0.12; P<0.01) with a significant interaction between both subgroups, significant reduction in the mean St. George’s Respiratory Questionnaire (SGRQ) score (MD -1.67; 95% CI -2.02- -1.31; P<0.01), and more patients experienced 4 points reduction of SGRQ score (OR 1.27; 95% CI 1.19-1.35; P<0.01). Triple therapy was associated with an increased risk of pneumonia when compared to LABA/LAMA (OR 1.25; 95% CI 1.03-1.97; P=0.03) but there were no significant differences in other adverse events between triple and dual inhalers. In meta-regression analyses, the only significant finding was in patient with higher baseline FEV1% of predicted value who were more likely to benefit from triple-inhaler therapy.

FIGURES

Figure 1: Forest plot for moderate-to-severe COPD exacerbations outcome.

Figure 2: Forest plot for absolute FEV1 change from baseline.

Figure 3: Forest plot for pneumonia.

CONCLUSIONS

Among patients with moderate-to-severe COPD, triple inhaler therapy was associated with a reduction of moderate-to-severe COPD exacerbations, improved lung function, and improved quality of life when compared to dual inhaler therapy but with an increased pneumonia risk.
Acute Pancreatitis in Sickle Cell Vaso-Occlusive Crisis – A Rare Presentation of a Common Disease

We'am Hussain MD, Nneoma Onuorah MBBS, Immaculate Foy MD, Marc Raslich MD
Dayton VA Medical Center and Wright State University Boonshoft School of Medicine Internal Medicine Residency Program

Introduction

Sickle cell disease (SCD) is a genetic autosomal recessive disorder resulting from a mutation of Hemoglobin S, characterized by vaso-occlusive crisis (VOC) and hemolytic anemia. Vaso-occlusion is caused by sickle-shaped red blood cells (RBCs) that obstruct micro vessels, ultimately resulting in mesenteric ischemia, pain and necrosis1. Acute abdominal pain is a common presentation of VOC, which could involve any of several abdominal organs. However, acute ischemic pancreatitis is a very rare complication of VOC2. Our goal is to create awareness of the importance of considering this etiology as a possible cause of abdominal pain in VOC. Timely diagnosis is key owing to a different management approach in these patients.

Case Report

A 19-year-old woman with homozygous sickle cell disease, hemoglobin SS, and a history of cholecystectomy, and no history of alcohol abuse or hypercholesterolemia, presented with nausea, vomiting, abdominal pain, and bilateral hip, knee, and ankle joint pain. She is well known to our treatment team as medical history includes multiple hospitalizations for abdominal pain from VOC. Physical exam was remarkable for epigastric tenderness radiating backwards, nausea and vomiting. The pain was similar to previous painful VOC in the past. Patient was afibrile, with no leukocytosis and lipase was elevated at 1468U/L. Computed tomography (CT) of the abdomen showed fat stranding surrounding the pancreatic tail. Symptoms resolved with intravenous fluid (IV) hydration and pain medications, and diet was advanced from clear fluid diet to regular diet by day 5 of admission.

Discussion

• Abdominal pain is a common presentation of sickle cell VOC, with involvement of any abdominal organ as a result of capillary engorgement, sickling of RBCs, hypercoagulability and stasis in the vasa vasmorum of larger vessels3. Every year, about 10% of SCD patients hospitalized for VOC present with acute abdominal pain4.

• Common etiologies in these patients include acute splenic sequestration crisis, splenic infarction, ischemic bowel, biliary colic, acute cholecystitis, opioid induced constipation, renal papillary necrosis, hepatic crisis, Urinary tract infection, hepatitis and liver abscesses5. Acute pancreatitis rarely occurs in VOC sickle cell crises6.

• Akingbola et al in a 2011 small prospective study showed that 70% of acute abdomen in VOC involved the epigastric region with similar presentation to acute pancreatitis2. When it occurs, it may be due to biliary obstruction, or micro vessel occlusion causing ischemia.

• We present this case because despite acute abdominal pain being a relatively common complaint in patients with VOC, life-threatening complications can occur if micro vessel occlusive induced pancreatitis is missed, since it is clinically indistinguishable from acute abdominal pain from sickle cell VOC and initial diagnosis is based on clinical suspicion.

• Our patient met the criteria for acute pancreatitis with serum lipase elevated at greater than three times the upper limit, associated with presence of epigastric pain radiating to the back.

• Treatment is similar to any other presentation of acute pancreatitis, which is initially conservative with IV fluids, pain control and electrolyte repletion. The clinical significance of early diagnosis relies on the indication for exchange blood transfusion in worsening cases of acute pancreatitis characterized by multi-organ failure8,9 which helps dilution of Hemoglobin S and reduction in sickling with hemoglobin S goal less than 20-30%10.

Conclusion

We hope to create awareness of acute pancreatitis in sickle cell VOC and encourage a stepwise approach in investigating acute abdomen. Medical providers should have a clinical suspicion for acute pancreatitis even when familiar with the medical history of these patients as this will prevent complications from this manageable yet rapidly deteriorating condition.

References


Figure 1: CT of abdomen consistent with acute pancreatitis
Superior Vena Cava Syndrome in the setting of Intravascular Diffuse Large B cell Lymphoma (DLBCL)

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INTRODUCTION

• Diffuse Large B Cell Lymphoma (DLBCL)- commonest subtype of Non-Hodgkin Lymphoma.
• Incidence of primary DLBCL within a major vessel is very rare.
• The vignette describes a case of DLBCL within the Superior Vena Cava causing SVC syndrome.

CASE PRESENTATION

• A 56 year old female presented with chest tightness, SOB and venous distention in her face and neck for 4 weeks.
• Chest CT was suspicious for an intravascular thrombus, and she underwent thrombolysis without any improvement.
• Repeat imaging with MRI - occlusive mass in the SVC suspicious for leiomyosarcoma (Figure 1).
• The mass was resected from the posterior aspect of the SVC, and her symptoms resolved after surgery.

PATHOLOGIC ANALYSIS

• Large lymphocytes with nuclear pleomorphism and prominent nucleoli. (Figure 3).
• Flow Cytometry- CD19, CD20, CD23, CD38
• IHC-CD20,23,21,BCL6,MUM1,CD30 (Figure 4).
• The mass was thus confirmed to be a Diffuse Large B cell Lymphoma.

DISCUSSION

• The DLBCL in our case is distinct from Intravascular Lymphoma which arises in small blood vessels.
• 40% of primary NHL can be extra nodal- GI, testes, tonsils, CNS (1). However, only few cases of an intravascular DLBCL have been reported.
• SVC syndrome- 60-85% cases due to an intrathoracic malignancy.
• SVC syndrome in NHL is from extrinsic compression. In our case, diagnosis was challenging as the obstruction was intravascular.
• In non emergent SVC syndrome due to a lymphoma, initial treatment is chemotherapy. A surgical approach was needed in our case due to diagnostic uncertainty.
• Limited data is available for preferred treatment of intravascular DLBCL. A few case reports have shown satisfactory response to R-CHOP therapy (2).

CONCLUSION

• Primary extra nodal DLBCL within the SVC is extremely rare, and the presentation can be complicated by an SVC syndrome.
• Recognizing an intravascular DLBCL is challenging, and surgical resection might be required.
• Data about the pathophysiology and treatment options is limited due to its rarity, and further case reports are required in the future.

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References
IgG4-related disease is an increasingly recognized immune-mediated fibroinflammatory condition. The hallmarks of the disease process include an increase in serum concentration of IgG4, lymphoplasmacytic infiltration of tissues by IgG4-positive plasma cells, and tumor-like swelling of organs leading to organ failure. Involvement of nearly all body organs have been previously described, although very few cases exist in literature with pulmonary manifestations. Here, we report a case of IgG4-related lung disease (IgG4-RLD), which is a rare subset of IgG4-related disease.

A 74 year old female with a history of lymphocytosis, COPD, and 50 pack-year smoking history initially presented with acute, progressively worsening cough and shortness of breath. A chest CT had demonstrated multiple pulmonary nodules, and several spiculated masses within the left lung fields including a 4.0 x 3.3 x 3.4 cm left upper lobe mass. The patient underwent navigational bronchoscopy with EBUS, and transbronchial biopsy of the left upper lobe lesion. Follow up PET scan demonstrated hypermetabolic lung masses in the left lung fields and mild lymphadenopathy. A tissue sample was sent to Pathology at the University of Michigan for review. The specimen was found to be non-cancerous, but was noted to be consistent with an inflammatory process with fibrosis. There was evidence of numerous IgG4-positive plasma cells, suggestive of possible IgG4-related lung disease. She was started on the appropriate treatment of high dose Prednisone therapy and had significant improvement of her symptoms.

IgG4-RLD is a rare clinical entity leading to tumefactive and tissue-destructive lesions, which can cause respiratory failure and death. Isolated pulmonary involvement is rare among IgG4-RD, and can radiographically mimic malignancy. Four major patterns of lung involvement identified by chest CT are solid nodular, bronchovascular, alveolar interstitial, and round ground-glass opacities. However, tissue biopsy demonstrating characteristic histological features remains central to the diagnosis of IgG4-RLD. International consensus guidelines for the treatment and management of IgG4-RLD have been published, and suggest the condition responds to glucocorticoid therapy.

Early recognition and suspicion of IgG4-RLD in patients who present with cough and shortness of breath can lead to better outcomes, and a high index of clinical suspicion is needed to confirm the diagnosis.

REFERENCES

Pulmonary Tuberculosis Has Gut Feeling: A Case Of Pulmonary Tuberculosis Presenting with Gastrointestinal Symptoms

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ABSTRACT

Intestinal tuberculosis is a rarer entity of tuberculosis comprising about 1-3 % of all tuberculosis cases. Its nonspecific presentation often results in a misdiagnosis to other infections, IBD or tumors. This case highlights the existing challenge in the diagnosis of intestinal tuberculosis specifically colonic tuberculosis. It also emphasizes on the importance of clinical suspicion in appropriate setting, where delay in diagnosis can be detrimental to the patient and population at large.

INTRODUCTION

Tuberculosis (TB) is relative rare in developed countries and intestinal TB is rarer still, comprising only about 1-3% of TB cases. Approximately, 20% of patients with intestinal TB have coexisting pulmonary TB. We present a case of active pulmonary TB with diffuse colonic involvement manifesting predominantly with gastrointestinal (GI) symptoms

CASE PRESENTATION

A 42 year-old male immigrant, without significant past medical history, presented with a 3-month history of right lower abdominal pain, watery diarrhea and weight loss. He reported episodic fever with chills. He had prior hospitalization for similar symptoms, treated with antibiotics with substantial improvement. The patient had right lower quadrant abdominal tenderness without guarding. Leukocyte count was 14,3000 with lymphocytes of 13%. He was admitted with a preliminary diagnosis of inflammatory bowel disease (IBD). CT abdomen showed right mid-abdominal small bowel intussusception with terminal ileitis and nonspecific colitis of ascending colon. CT chest revealed bronchiectasis with left apical consolidation. Colonoscopy showed scattered sessile polypoid vs pseudopolypoid lesions with inflammation in sigmoid, descending and ascending colon, and terminal ileum. Biopsy showed cryptitis, crypt abscesses and extensive necrosis. Necrotic granuloma with multinucleated giant cells and acid-fast bacilli (AFB) were identified. Sputum smear and cultures were positive for Mycobacterium Tuberculosis (MTB). HIV was negative. Diagnosis was confirmed as active pulmonary TB with diffuse colonic involvement, 4-drug regimen was started, and a month later, the patient was doing well with no residual symptom. Surveillance of close contacts revealed one child with active pulmonary TB and another with positive QuantiFERON.

DISCUSSION

TB remains a healthcare problem in the U.S. Intestinal TB is usually caused by MTB and rarely by Mycobacterium Bovis. GI infection occurs by ingestion of infected sputum, hematogenous and lymphatic spread from pulmonary foci, and contiguous spread from adjacent organs. The most common symptoms are abdominal pain, weight loss, fever, diarrhea and constipation. These nonspecific symptoms frequently result in a misdiagnosis of other infections, IBD or tumors. Once suspected, the mainstay of diagnosis is colonoscopy. Ileocecal region is the most common site of involvement. Colon may be segmentally involved but diffuse colitis is rare. There may be ulcers, nodules, deformed ileocecal valve and strictures. Polypoid lesions seen in our patient are rare findings. Granulomas are found in up to 70% of cases whereas caseating necrosis and AFB are identified only in 10-20%. Culture can be negative in up 70%. In view of its nonspecific presentation, intestinal TB in the absence of concurrent pulmonary involvement poses a diagnostic challenge. In our case, previous workup in earlier admission missed the diagnosis because of the nonspecificity of the patient’s symptoms. A high index of suspicion for intestinal TB should be maintained whenever the patient’s socioeconomic background and clinical features suggest the diagnosis.

REFERENCES

Learning Objectives

Review the differential diagnosis and evaluation of chronic cough
Review the pathophysiology and diagnostic evaluation of Good syndrome

Case Description

ID: 57 year old male with history of resected thymoma two years prior presented to pulmonary clinic for chronic cough of one year.

HPI:
- Patient had daily cough productive of yellow-green sputum
- Resolved with antibiotics, but would recur shortly afterwards
- ROS: Reports associated fevers
  - Denied chills, weight loss, hemoptysis, night sweats
  - Denied rhinorrhea, watery eyes, wheezing
- Denied spicy food, food late at night, epigastric burning
- Denied ACE inhibitor use
- Social History:
  - Emigrated from the Philippines 10 years ago, but denied any recent travel
  - Denied any pets or birds
- Prior work exposure to pesticides and cleaning solutions
- 30 pack year smoking history, but stopped 10 years ago

Physical Exam:
- Lungs: good air movement, clear to auscultation bilaterally, no wheezes, railes, rhonchi, or other adventitious breath sounds

Clinical Course:
- Tried extensively on antitussives, antihistamines, bronchodilators, and PPI
- Unremarkable fiberoptic nasopharyngoscopy by ENT
- Initially, suspected diagnosis was chronic bronchitis, and the plan was to optimize medications for COPD.
- However, on further review of clinical history, given patient’s improvement of symptoms with antibiotics, multiple ED visits concerning for recurrent pneumonia, and history of thymoma, patient was worked up for immunodeficiency.
- Immunoglobulins returned low at IgA ~ 13 mg/dL (low), IgG ~ 207 mg/dL (low), and IgM <3 mg/dL (low).
- Patient was referred to Allergy/Immunology and diagnosis of Good’s Syndrome, which is acquired immunodeficiency with history of thymoma, was made.

Subsequent Course:
- Initiated on intravenous immunoglobulin replacement (IVIG)
- ED visits decreased significantly over a two year period
- Patient remained adherent, but has had breakthrough infections, requiring subsequent increases in IVIG
- One year after initiation of IVIG, patient has only had one major hospitalization for multifocal pneumonia, compared to almost every other month ED visits the year prior.

Discussion

Good’s Syndrome:
- Good’s syndrome was first described in 1954 by Robert Good. Given it’s rarity, there are no formal diagnostic criteria. Limited retrospective studies and case reports have agreed that the two main characteristics that define Good’s syndrome are thymoma and acquired immunodeficiency.
- Due to its immunodeficiency, the clinical presentation is often with recurrent sinopulmonary infections or with infections more commonly seen with defects in cellular immunity such as CMV and candidiasis.
- Immunodeficiency often does not resolve after thymectomy.
  - The exact mechanism is not known; however, it is postulated that abnormal T-cells suppress B-cells, causing low serum immunoglobulins.
  - This phenomenon is thought to remain despite thymectomy given peripherally produced abnormal T-cells.
- The mainstay of treatment for patients with Good’s syndrome is IVIG. However, per one epidemiological study on Good’s syndrome, the response is mixed, and for some patients, despite IVIG treatment, progression to refractory infections is not uncommon.

Our patient:
- Our patient fits the classical picture of Good’s syndrome with history of thymoma and acquired immunodeficiency, presentation with recurrent pneumonias, persistence of symptoms despite thymectomy, and clinical response to IVIG
- This case illustrates the importance of taking a detailed history and placing it in clinical context. The patient has been followed as an outpatient in primary care clinic and was admitted multiple times for recurrent pneumonia. It was natural to presume that our patient had COPD exacerbation given his smoking history. However, the history of thymoma and recurrent pneumonias pointed toward a diagnosis of Good’s syndrome.
- Although our patient has had good response, the patient has been recently hospitalized more frequently, with need to increase IVIG infusion. This is consistent with one retrospective study’s finding that prognosis with Good’s syndrome is often worse compared to other similar immunodeficiency syndromes, such as combined variable immunodeficiency syndrome or X-linked agammaglobulinemia, with significant mortality and morbidity secondary to recurrent infections despite IVIG infusions.

Implications

Chronic cough is a common outpatient chief complaint that has a broad differential. Most of the time, routine work up is sufficient to diagnose the etiology; however, for refractory cases, it is important to broaden one’s differential as there can be clinically significant treatment options

Early recognition of Good’s syndrome can result in earlier initiation of therapy that can prevent recurrent infections and hospitalizations

References

**Introduction**

- IgG4 related disease (IgG4 RD) is an immune mediated fibro-inflammatory condition
- IgG4 RD is unique in its ability to affect multiple organ systems, leading to its varied symptom presentations
- Here we present a rare manifestation of IgG4 RD of the larynx

**Case**

- 69 year-old male with a history of:
  - Dacryoadenitis in 2011 treated with radiation therapy
  - Presumed autoimmune pancreatitis in 2013
  - Pancreatitis prompted immunohistochemistry of 2011 lymphoid tissue biopsy leading to IgG4 RD diagnosis
    - Lymphoplasmacytic tissue infiltrate with high concentration of IgG4 plasma cells (Figure 2)
    - Storiform fibrosis (Figure 1)
    - Can have obliterator phlebitis and increased eosinophils

- Presented with cough and upper airway symptoms in Fall 2015
  - Progressed to hoarseness, severe cough with secretions and dyspnea

**Clinical Course**

- "Breathing through a straw"
  - Laryngoscopy showed inflammation of epiglottis and vocal cord dysfunction suggestive of laryngopharyngeal reflux
  - Started on high dose proton pump inhibitor, H-2 blocker and sucralfate
  - Vocal cord dysfunction continued to worsen, hospitalized
  - Unremarkable EGD and barium swallow study

- A PET scan was performed
  - Increased metabolic activity of multiple lymph nodes, thoracic aorta and of larynx (Figure 3)

- Due to clinical concern for aortic involvement and potential for complications
  - Treated with prednisone 40mg/d and rituximab 1g IV x 2
  - Symptoms resolved, PET findings cleared
  - Repeat Laryngoscopy revealed resolution of laryngeal inflammation

- Clinical course Fall 2017
  - Respiratory symptoms returned
  - Successfully retreated with rituximab
  - Receiving rituximab every 6 months

**Discussion**

- IgG4 RD is a fibro-inflammatory condition able to affect multiple organ systems
- Common presentations include autoimmune pancreatitis, lymphadenopathy and salivary gland involvement
- Can involve almost any tissue individually or as a multisystem diagnosis
- Diagnosis suggested by clinical symptoms but confirmed with tissue biopsy
- Our patient has lacrimal tissue biopsy consistent with diagnostic criteria
- Appears very responsive to anti CD-20 monoclonal antibody treatment
- Less than 10 cases reported in literature involving laryngeal involvement

**References**

**Introduction**

*Candida krusei* is an uncommonly isolated *Candida* species that is a rare cause of empyema. Risk factors include gastrointestinal (GI) perforation, abdominal infections, and open surgeries. Prevalence of non-albicans *Candida* species has increased recently, which is important due to their varying susceptibilities to antifungal agents. *Candida* species are known to colonize the skin, mucous membranes, and GI tract. A break in any of these barriers can act as a portal for invasion resulting in infections such as empyema.

**Case Report**

A 79-year-old female with hypertension, coronary artery disease, and hyperlipidemia presented with worsening dyspnea for three hours. She was recently hospitalized for two days after choking on a piece of chicken at home, and was discharged a few hours prior, diagnosed with a hiatal hernia. On examination, she was tachypneic, hypotensive, and afebrile with diminished breath sounds in the left lower lung, extending two-thirds of the way up. Chest X-ray (Figure 1) revealed a large, loculated pleural effusion with compressive atelectasis of the left lung, and initial white blood cell (WBC) count was 14.2. Subsequent chest computed tomography (CT) demonstrated loculated effusion and hiatal hernia (Figure 2).

The patient was treated with empiric ampicillin-sulbactum for aspiration pneumonia and possible empyema. She underwent thoracentesis and video-assisted thoracoscopic surgery with chest tube drainage. Pleural fluid cytology was negative for malignancy, but the culture grew *Candida krusei*, *Strep mitis oralis*, *Strep salivarius* and *Candida krusei*, which prompted adding anidulafungin to her treatment. A swallow evaluation did not reveal a leak from the esophagus or stomach.

On day 12, she had dark stools, and her hemoglobin had decreased from 11.7 to 6.4 g/dL. This prompted an upper GI evaluation. The patient was treated with empiric ampicillin-sulbactum for aspiration pneumonia and possible empyema. She underwent thoracentesis and video-assisted thoracoscopic surgery with chest tube drainage. Pleural fluid cytology was negative for malignancy, but the culture grew *Candida krusei*, *Strep mitis oralis*, *Strep salivarius* and *Candida krusei*, which prompted adding anidulafungin to her treatment. A swallow evaluation did not reveal a leak from the esophagus or stomach.

**Discussion**

This is a rare case of *Candida krusei* empyema, with only four cases previously reported (Table). A pediatric case of empyema was reported, which was a result of co-infection of *C. tropicalis* and *C. krusei*, linked to recent patent ductus arteriosus (PDA) device closure. A pregnant female was reported to suffer from *C. krusei* empyema due to spontaneous esophageal perforation from *Candida* esophagitis. Two other cases of *C. krusei* empyema were linked to esophageal perforation and lung transplant, respectively.

Similar to our case, two of the above published cases were linked to esophageal perforation as the etiology of *C. krusei* empyema, while the others occurred in the setting of open surgery. These risk factors likely allowed *C. krusei* to translocate from the skin and GI tract to the thorax, resulting in empyema.

*C. krusei* is resistant to fluconazole, but is susceptible to amphotericin, echinocandins and newer azoles such as voriconazole, posaconazole, and isavuconazole. Early diagnosis, use of antifungal agents, and pleural drainage can help improve outcomes.

**Conclusion**

*Candida krusei* is an uncommon species that is fluconazole-resistant. *Candida* species colonize mucous membranes and the GI tract, so thoracic involvement typically results from an esophageal perforation, fistula, or surgery. In the absence of known risk factors, diagnosis of *Candida* species in the pleural space should prompt upper GI evaluation.

**Table.** Summary of prior published cases of *Candida krusei* empyema

<table>
<thead>
<tr>
<th>Age</th>
<th>Gender</th>
<th>Risk Factor</th>
<th>Mixed Infection</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Female</td>
<td>Recent PDA device closure</td>
<td>Yes</td>
<td>Deceased</td>
</tr>
<tr>
<td>45</td>
<td>Female</td>
<td>Esophageal perforation 2/2 <em>Candida esophagitis</em></td>
<td>No</td>
<td>Deceased</td>
</tr>
<tr>
<td>58</td>
<td>Female</td>
<td>Lung transplant and postoperative hemorrhage</td>
<td>No</td>
<td>Deceased (from graft failure four months later)</td>
</tr>
<tr>
<td>59</td>
<td>Male</td>
<td>Esophageal perforation 2/2 Boerhaave syndrome</td>
<td>No</td>
<td>Survived</td>
</tr>
</tbody>
</table>

**References**

Pylephlebitis, Gram Negative Sepsis and Cyclical Wheezing: A Case of Strongyloidiasis

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Background

- **Strongyloides stercoralis** is a parasitic nematode which is associated closely with gram negative bacteremia particularly in the setting of hyperinfection.
- The dissemination of the larva via the bloodstream and to various end organs causes an inflammatory response which manifests clinically as hyperinfection syndrome.
- Portal venous gas and pylephlebitis are seen in complicated intra-abdominal sepsis.
- Pylephlebitis is a rare association with Strongyloides and has only been documented in a few case reports.

Conclusions

- Clinical spectrum of strongyloidiasis is highly varied.
- Eosinophilia is not universal and may be absent in the setting of concomitant pyogenic infection.
- Strongyloides hyperinfection syndrome is associated with high mortality.
- Cyclical wheezing in the setting of gram negative sepsis should prompt consideration of parasitic infection such as Strongyloides.
- Presence of gas in the portal venous tract is associated with high morbidity and mortality. Pylephlebitis is a suppurative infection of the portal vein which is associated with gram negative bacteremia most commonly with *Bacteroides*.
- Diagnosis of strongyloidiasis should be considered in high risk populations such as immigrants, refugees, long term travelers, etc. even if last exposure was many decades ago.
- Testing involves stool samples for larvae and serology. Serology has sensitivity of 80-89% and specificity of 97%.
- In the relevant clinical setting Strongyloidiasis should be considered as a possible cause of intra-abdominal sepsis.

Clinical Case

- A 59-year-old gentleman presented with acute onset fever, chills, abdominal distension and cholestatic jaundice. He was previously healthy, had no sick contacts and no recent travel.
- At presentation he met SIRS criteria for sepsis and our initial differentials included cholecystitis, cholangitis, and cholechocholithiasis. However this patient denied having any abdominal pain. There was no history of gallstones, prior surgeries.
- Labs were significant for leucocytosis, direct hyperbilirubinemia and mild AST/ALT elevation but no ALP elevation.
- Imaging ruled out obstruction in the biliary tract and cholecystitis.
- He was noted to have hepatic portal venous gas, pylephlebitis and diverticulitis.
- He also had *E. coli* bacteremia and was treated with intravenous antibiotics.
- During the hospitalization he was noted to have short, intermittent, self-limited episodes of wheezing and rigors which he later told us had been occurring infrequently for several weeks.
- Cyclical wheezing in the setting of gram-negative sepsis prompted us to consider the possibility of a parasitic infection such as *Strongyloides*.
- Subsequently on probing his travel history we found that he had travelled extensively in the remote past over 30 years back.
- Serological testing for *Strongyloides stercoralis* came back positive for the patient.
- Unfortunately our patient left against medical advice.

References


Figure A: Lifecycle of Strongyloides.
Hemolytic uremic syndrome is a microvascular thrombosis associated with thrombocytopenia, hemolytic anemia and acute kidney injury. The disease is further classified as typical (85-90%) or atypical (15-10%) depending on the etiology. The former is related with Shiga toxin-producing Escherichia coli (STEC); meanwhile the latter could be precipitated by other types of infections (predominantly S. pneumoniae, influenza A, HIV), drug toxicity, autoimmune diseases or genetic disorders. The annual incidence of atypical hemolytic uremic syndrome (aHUS) in adults is approximately 2/1,000,000 versus 3.3/1,000,000 in patients under age of 18. The complement system, especially the alternative pathway, is the cornerstone of the pathogenesis of aHUS. Either genetic mutations in complement factor H and the CD46 or uncontrolled C3 convertase activity, precipitated by any of the above-mentioned factors, can lead to deposition of complement proteins in the vessel and subsequent prothrombotic state. Unlike patients with typical HUS in which 70% of the patients completely recover their renal function, up to 50% progress to end-stage renal disease (ESRD).

**CASE DESCRIPTION**

This case describes the hospital course of a 76-year-old woman who presented with dyspnea and oliguria. Creatinine was 3.6 mg/dL upon admission, and she eventually developed anemia and thrombocytopenia. ADAMTS-13 was moderately decreased, and the antibody panel and complement levels were unremarkable. Due to volume overload, the patient was started on renal replacement therapy and a renal biopsy was performed demonstrating thrombotic microangiopathy with diffuse positive staining of C5b-9 within glomeruli and small arterial vessels. Her hospital course was complicated with a pericardial effusion requiring pericardial window. After preliminary biopsy results were obtained, treatment with eculizumab (monoclonal antibody against complement factor 5) began. Patient still requires three times per week hemodialysis and additional treatment with C5 inhibitor.

**REFERENCES**

We present a 38 year old male with no prior medical history who came to the ED with a three day history of severe, cramping lower abdominal pain. This was intermittent, non-radiating, and was exacerbated with movement. Associating symptoms were anorexia, constipation, fever, chills, nausea and retching. He denied use of tobacco, alcohol or recreational drugs.

Physical exam revealed an acutely ill patient who was febrile (38.8°C), with pulse 89 beats/min, respiratory rate 18 cycles/min, BP 164/85 with orthostatic changes and oxygen saturation (room air) 98%. On abdominal exam, there was generalized abdominal tenderness with rigidity and guarding. Respiratory exam was benign. The patient was therefore worked up for an intra-abdominal cause of acute abdomen.

Review of systems by the admitting team highlighted a history of intermittent productive cough with yellow sputum one day prior to presentation. Dullness to percussion over right posterior lower lung fields, was also noted on exam. Pneumonia hence became the diagnosis, with an atypical presentation of acute abdomen. The patient was admitted and treated with ceftriaxone and azithromycin. On day two, lung crepitations became evident, which resolved prior to discharge.

Community acquired pneumonia is a commonly treated disease. However, it may present in very unfamiliar ways that if missed may result in unnecessary testing, procedures and potential harm. Encouraging reporting and discussion of these atypical presentations may help increase clinical suspicion as well as timely diagnosis.

Extra-pulmonary symptoms may occur depending on the organism involved, however they are usually not the predominant feature and usually proceed or occur with the respiratory symptoms. Abdominal pain as a presenting feature of pneumonia is uncommon in adults (2-5% of cases) and is more common in children. Abdominal symptoms do not always precede abdominal findings, and in some cases, may not become fully prominent until later in the illness.

Atypical presentation of pneumonia is reputable to leading physicians to incorrect diagnoses and management.

Awareness of the chameleon potential of common diseases such as community acquired pneumonia can sharpen our clinical acumen, reminding us the importance of the utilization of a thorough review of systems as well as a contextual approach to diagnosis.
An Unusual Presentation of Amyopathic Dermatomyositis with Interstitial Lung Disease

Authors: Russell Purpura MD, Mrisa Sahai MD, Rajat Kapoor MD

Learning Objectives
- Define and diagnose Amyopathic Dermatomyositis
- Learn extra-cutaneous manifestations and prognosis

Patient Presentation
- 60 year old female with shortness of breath and generalized fatigue.

Pertinent Physical exam:
- Oxygen Saturation 82% on room air

Laboratory Data:
- Creatine kinase: 10 (30-220 U/L)
- AST: 74 (10-35 U/L) and ALT: 106 (10-50 U/L)
- ESR: 33 mm/hr and CRP 1.1 mg/dl
- Negative anti-Jo-1, RF, ANA, anti-Ro/La and Myomarker panel 3

Clinical Course:
- Admitted for extensive SQ emphysema and new oxygen requirements.
- Discharged on 40mg of prednisone and 3 L of oxygen after infectious work up was negative.
- Followed up with rheumatology and pulmonary who started mycophenolate mofetil 1000 mg twice daily.
- One year follow up with almost resolution of skin findings and 1 L of oxygen on exertion.

Discussion:
- Diagnose clinically with symptoms, imaging and labs.
- Extra-cutaneous manifestations:
  - Interstitial lung disease (ILD) - 15-100%\(^2\)
  - Malignancy (adenocarcinoma) - 14%\(^2,3\)
  - Cardiac and esophageal disease
  - Interestingly, risk of malignancy is significantly decreased if ILD is present.\(^1\)
  - ADM makes up 10-20% of DM, which is likely an underrepresentation.\(^2,4\)

Why is this unique?
- An incredibly rare presentation with limited case reports.
- A progressive disease with full presentation at initial encounter\(^2,3\)
- ADM and ILD typically have rapidly progressive lung disease. She’s on 2 L oxygen ~1 year later.\(^4\)
- High mortality ranging from 39 to 80% in less than 6 months.\(^1,2\)

Amyopathic dermatomyositis is an autoimmune inflammatory myopathy characterized by typical skin findings of dermatomyositis, but negative myalgias, muscle enzymes and antibody work up.

A unusual presentation in which diffuse subcutaneous emphysema, pneumomediastinum with Gottron’s papules and heliotrope rash requiring 3 L of oxygen.

Refer to QR for references.
Two Roads Diverge in a Yellow Patient: Diagnostic Challenge of Pancreatic Tuberculosis

Jennifer L. Peng, MD, Indiana University1 • Mahmoud Rahal, MD, Indiana University2 • Antoine N. Saliba MD, Indiana University3
Indiana University School of Medicine, Indianapolis, Indiana

INTRODUCTION

- Pancreatic tuberculosis is a rare clinical diagnosis as its presentation usually mimics pancreatic cancer
- Pancreatic tuberculosis can have myriad presentations and imaging studies usually show pancreatic masses, cystic masses, or abscesses
- Rare diagnosis even in areas with high prevalence of tuberculosis
- Abdominal tuberculosis most commonly affects ileocolic region with kidney, spleen, and liver more involved than pancreas
- Excellent response to antitubercular therapy makes early diagnosis of pancreatic tuberculosis critical

CASE DESCRIPTION

- 75-year-old male leather worker from Mexico presenting with acute-onset, moderate-to-severe epigastric and left upper quadrant abdominal pain as well as nausea with non-bilious, non-bloody emesis for 5 days
- Also reporting subjective fever, chills, increased diaphoresis for a few days, unintentional three-month weight loss over the preceding three months
- No abdominal distention, constipation, diarrhea, but no signs of acute abdomen. No flank pain as well as nausea with non-bilious, non-hematochezia, melena
- Physical examination significant for tachycardia, jaundice, soft abdomen with tender epigastrium, jaundice, soft abdomen with tender epigastrum but no signs of acute abdomen. No flank fullness, shifting dullness, or stigmata of chronic liver disease.

LABORATORY EVALUATION

- Leukocytosis with bandemia
- Total bilirubin 7.4 mg/dL
- Direct bilirubin 5.6 mg/dL
- Alkaline phosphatase 489 IU/L
- Albumin 1.5 g/dL
- Lipase 3,482 units/L
- CA 19-9 (4101 U/mL)
- Albumin 1.5 g/dL
- CA 19-9 (1613 U/mL)
- Lipase 3,482 units/L
- Albumin 1.5 g/dL
- Alkaline phosphatase 489 IU/L

IMAGING

- Started on piperacillin/tazobactam for possible cholangitis on admission
- On hospital day 4, underwent endoscopic ultrasound (EUS) that showed a mass of the pancreatic uncinate process with diffuse pancreatic and biliary ductal dilatation as well as peripancreatic, porta hepatis, and retroperitoneal lymphadenopathy
- On the same day, underwent endoscopic retrograde cholangiopancreatography (ERCP) with stent placement and fine needle aspiration (FNA inconclusive)
- Infectious work-up significant for positive T-spot assay
- Repeat pancreatic biopsy completed and pancreatic mass found to be a tuberculosis on pathological examination

DISCUSSION

- Pancreatic tuberculosis first identified by Auerbach in 1944
- Most cases in young females from endemic area for tuberculosis
- Very few cases from United States
- Vague symptoms and lack of clear clinical findings make clinical diagnosis difficult
- Diagnosis with acid-fast bacilli, caseating granulomatus inflammation on biopsy, cultures pancreatitis
- Direct histopathological examination is best means for diagnosis
- Tuberculosis can be detected with special staining or with PCR-based detection of mycobacterium tuberculosis DNA (highly specific)
- In setting of acquired immunodeficiency syndrome and use of immunosuppressant drugs, keep pancreatic tuberculosis on differential for abnormal pancreatic masses
- Complete cure can be achieved with standard anti-tubercular therapy

MANAGEMENT

- Infectious work-up significant for positive T-spot assay
- Repeat pancreatic biopsy completed and pancreatic mass found to be a tuberculosis on pathological examination

CONCLUSIONS

- Pancreatic tuberculosis is an important health concern even within developed countries like the United States
- Consider pancreatic tuberculosis in patients presenting with pancreatic lesions and peripancreatic lymph nodes
- Most appropriate diagnostic tools include CT of the abdomen and EUS-guided biopsy or FNA
- Direct histopathological examination is best means for diagnosis
- Tuberculosis can be detected with special staining or with PCR-based detection of mycobacterium tuberculosis DNA (highly specific)
- In setting of acquired immunodeficiency syndrome and use of immunosuppressant drugs, keep pancreatic tuberculosis on differential for abnormal pancreatic masses
- Complete cure can be achieved with standard anti-tubercular therapy

REFERENCES

Avoiding “Rash” Conclusions: A Case of Adult Onset IgA Vasculitis with Cutaneous, Gastrointestinal, and Renal Involvement

Amanda Dowden, MD; William West, MD;
New York University School of Medicine

CLINICAL CASE

HPI: 59 y.o. man with psoriasis presented to clinic with a week of abdominal pain and decreased PO intake. An outpatient EGD was done, notable for duodenitis. He was started on a PPI. However, his symptoms persisted and he later developed a progressively worsening rash which started on his legs, and subsequently spread to his arms, hands, and palms. He presented to the ED for further evaluation.

Physical Exam:
• Afebrile, vital signs within normal limits
• Skin: scattered non-blanching petechiae on his arms, and palpable purpura with ulceration on both legs.

Data:
• WBC: 27k (80% PMNs, no eos)
• Platelets: 301
• Serum creatinine: 2.0 mg/dL
• ESR of 96 mm/hr and CRP > 270 mg/L
• CT A/P with contrast: proximal small bowel dilatation with wall thickening and mesenteric inflammation.

Patient underwent a skin biopsy and was admitted to medicine for further management.

HOSPITAL COURSE

Skin biopsy revealed pustular vasculitis positive for IgA. These findings were consistent with systemic IgA vasculitis (HSP) with cutaneous and GI involvement. He was treated with pulse steroids and his GI symptoms and rash rapidly improved. Despite the treatment, he then developed hematuria concerning for renal involvement. His course was further complicated by a SMV thrombus. A hypercoagulable workup was unrevealing. He was treated with a prednisone taper, started on long-term anticoagulation, and was discharged home.

REFERENCES

DISCUSSION

IgA vasculitis is a systemic vasculitis with prominent skin findings. It is a pro-inflammatory state, with elevated levels of TNF-α and IL-6. Despite this fact, thrombotic events are a rare complication. Renal involvement tends to be more severe in adults, with higher reports of nephritic syndrome. While the GI tract is often involved in adults, severe manifestations such as intussusceptions and perforation, are much less common. IgA vasculitis tends to be self-limiting and the mainstay of treatment is supportive care. However, steroids should be considered in severe cases, though their use is controversial as the data is limited. Regardless, by reducing the edema in the intestinal wall, steroids are effective in treating abdominal pain associated with HSP.

CONCLUSION

While HSP is fairly uncommon in adults, it is important to consider when thinking about leukocytoclastic vasculitides. Early diagnosis of HSP is critical given the morbidity associated with the renal complications of the disease.
Aplastic Anemia Without the Anemia
Robert DeGrazia M.D., Jenny Petkova M.D., Michael Lankiewicz M.D.
Christiana Care Health System, Newark, DE

OBJECTIVES

Define the diagnosis of aplastic anemia
Recognize treatment options for patients with aplastic anemia

CASE

A 23 year old incarcerated male presented with petechiae and mucosal bleeding. He was found to have WBC of 2.6, ANC 1000, Hb 14.3 g/dL and platelets of 3,000. His metabolic panel and PT/PTT were normal.

His initial workup for common bacterial and viral infections including Parvovirus, hepatitis, HIV was negative and he underwent a bone marrow biopsy which revealed marked hypocellularity of 10% without dysplastic features.

He was transferred to our institution for evaluation of possible allogeneic stem cell transplant (SCT) for aplastic anemia. His repeat marrow evaluation confirmed hypocellularity of 5% and a normal karyotype. A chest CT scan identified no mediastinal masses.

He received a single transfusion of platelets prior to his transfer and during his hospitalization did not require any additional transfusions. He was evaluated for possible SCT and his sister was found to be a 10/10 identical HLA match, however she was in her first trimester of pregnancy and plans for transplantation were postponed.

He was immunosuppressed with cyclosporine and eltrombopag with excellent response and normalization of his white blood cell (WBC) and platelet counts.

Six months after initiation of therapy we began a slow taper of his cyclosporine. His platelet count dropped initially but later stabilized at approximately 90,000. Nine months after his initial diagnosis he remains on low dose cyclosporine 100 mg and 100 mg of eltrombopag daily.

DISCUSSION

Patients with aplastic anemia typically present with severe anemia and a low reticulocyte count however rare cases with isolated neutropenia or thrombocytopenia exist. The diagnosis requires a bone marrow biopsy with <20% cellularity and at least two of the following: A platelet count less than 20,000/microL, ANC of <500/microL, Reticulocyte count less than 20,000/microL.

Allogeneic stem cell transplantation is the typical treatment for young healthy patients with a matching sibling donor.

In the case of a transfusion independent patient whose donor was temporarily unavailable we opted for a course of immunosuppression first.

Since the patient remains in remission on his current therapy, we are planning on stem cell transplantation if he experiences a relapse.

CONCLUSION

Aplastic anemia involves depletion of all three cell lines however there is the possibility to have isolated neutropenia or thrombocytopenia.

Allogenic stem cell transplant is typically the treatment in young healthy patients with a matching donor.

In patients who can not undergo transplant, immunosuppression with Eltrombopag and cyclosporine

References

High-Value Care Education for Third-Year Medical Students
Paul Kunnath MD, Rachna Rawal MD, Jennifer M. Schmidt MD
Department of Internal Medicine, Saint Louis University School of Medicine, Saint Louis, MO

Introduction
• Develop high-value care habits during training as these will set foundation for life-long habits
• What do SLU Third Year Medical Students know about high-value care?
  ▪ 80% not familiar with “high-value care”
  ▪ 100% reported no prior education
• Help establish patient-centered practice habits

Curriculum Objectives
• Define ‘high-value care’
• Identify importance of value based healthcare
• Recognize low value care practices
• Utilize evidence based medicine to apply high value care principles
  ▪ Specifically for lab testing
  ▪ Apply clinical reasoning principles

Results

What Does “High-Value Care” Mean to Students?
□ Percentage of the 100 most used words in free response

Culture → Habit → Low-Value Care

Do Students Feel Comfortable Using EBM to Make Testing Decisions?*

Do Students Feel Comfortable Discussing Testing Indications with Team?*

Limitations
□ Data is self-reported via survey
□ Early recall bias
□ Overall lower post-survey response rates
□ Last clerkship group data pending
□ 6th month and end of year surveys pending

Conclusions
□ Students had minimal prior exposure to value based healthcare
  ▪ Completed online modules but still discrepancy in knowledge
□ After two didactic sessions:
  ▪ Increased confidence in application of evidence for decision making
  ▪ Increased engagement in high value discussions with treatment team

Next Steps
□ Address student identified barriers
  ▪ Medicine hierarchy hinders discussion
□ Reduce formal lecture based didactic
□ Expand curriculum to other clerkships
□ Include high-value care assessments in student presentations
□ Formal evaluation of high value care principles
□ NBME shelf examination

References

* p<0.05
Extremely Elevated Eos: A Case of Levetiracetam-Induced Eosinophilia

Masha Jones Slavin, MD1 & Todd S. Cutler, MD2
1New York-Presbyterian Hospital, 2Weill Cornell Medical Center, New York, NY

Learning Objectives
1. Recognize the main etiologies of eosinophilia, including medication-induced eosinophilia.
2. Assess patients for end-organ damage that may be caused by eosinophilia.

Case

Chief Complaint:
• 67 year old woman with breast cancer (s/p mastectomy, on chemotherapy, no evidence of disease) and deep vein thrombosis on rivaroxaban presented to outside hospital with one week worsening confusion.

Outside Hospital Course:
• Levetiracetam was started due to seizure activity on EEG and was uptitrated.
• Extensive work-up yielded working diagnosis of autoimmune encephalitis and she received methylprednisolone (1g daily for 5 days).

Hospital Transfer:
• Patient was transferred to our institution and mental status improved after 5 plasma exchange treatments.

Further Hospital Course:
• Infections complicating hospital course:
  • E. coli UTI and bacteremia treated with piperacillin-tazobactam, then cefazolin (completed Day 50)
  • Aspiration pneumonia treated with ampicillin-sulbactam (completed Day 48)
• By Day 56, remained clinically asymptomatic, mental status improved, nearing discharge

Laboratory and Radiology Data

Graph 1. Slowly uptrending eosinophil percent at outside hospital decreased after receiving steroids for autoimmune encephalitis.

Graph 2. Absolute eosinophil count peaked at 10,500/uL and downtrended after discontinuation of levetiracetam.

Discussion
• Etiologies of eosinophilia include malignancy, hematologic disorders, parasites, and hypoadrenalism.
• Certain medications can cause eosinophilia, including levetiracetam and cephalosporins.
• The main concern in eosinophilia is end-organ damage, including pulmonary or myocardial involvement.

• Work-up includes chest x-ray, urinalysis, troponin, and tests of liver and kidney function.
• Treatment focuses on addressing the underlying issue (e.g., medication discontinuation, treatment of parasite infection or malignancy).
• In severe eosinophilia, steroids may be helpful.
• Even with appropriate treatment, full resolution can take months.

Conclusions
• Eosinophilia can be caused by malignancy, hematologic disorders, parasites, hypoadrenalism, and medications such as levetiracetam.
• Patients with eosinophilia should be assessed for end-organ damage.
Background:
Hemophilia A is characterized by deficiency in factor VIII protein which results in spontaneous hemorrhage, easy bruising, and poor clotting activity after trauma or injury (1). Inflammatory bowel disease (IBD) specifically Crohn’s disease (CD) has a variety of clinical features with hematochezia as an occasional presenting sign (2). The purpose of this case is to describe the unusual occurrence of Crohn’s disease in a patient with hemophilia A.

Case Presentation:
A 19-year-old Caucasian male with a history of hemophilia A presented to our institution with a week history of painless hematochezia. Past medical history includes duodenal bulb ulcer requiring endoscopic therapy thought to be due to nonsteroidal anti-inflammatory drugs (NSAID) usage six years ago and anorectal abscess requiring incision and drainage with seton placement three months ago. The patient had no family history of IBD and denied usage of NSAIDs. Physical exam demonstrated a benign abdomen with rectal exam significant for a seton and bright red blood.

Discussion:
In the United States three million adults are diagnosed with IBD, while Hemophilia A affects only twenty thousand adults (3,4). Etiologies of hematochezia in young patients includes Meckel diverticulum, infectious, and idiopathic colitis but rarely CD. Bleeding in hemophilia can occur from gastritis, duodenitis, Mallory-Weiss tears, or AVMs (5-7). Isolated perianal fistulas and GI bleeding are rare initial manifestation of CD (8-10). Furthermore, massive GI hemorrhage is rare and individuals with perianal fistulas develop intestinal disease within a year (11-12). Classic symptoms such as diarrhea, abdominal pain, and weight loss were absent in this patient. Isolated duodenal disease has been described, however there are no cases of an isolated ulcer as an early clinical manifestation of CD (13). This case illustrates an unusual presentation of Crohn’s disease which is rarely seen in association with hemophilia patients.

Case Continued:
The patient was hemodynamically stable, mildly tachycardic, with a hemoglobin of 10.7 g/dL. Factor VIII activity was low at 44% and erythrocyte sedimentation rate (ESR) and C-Reactive Protein (CRP) were elevated to 38 mm/h and 41.2 mg/L. Hospital course included Factor VIII to control bleeding and transfusion of blood. Flexible sigmoidoscopy to rule out seton related bleeding and esophagogastroduodenoscopy (EGD) given his PUD history were negative except for dark blood material in the colon at 60 centimeters (figure 1). Colonoscopy was performed showing an inflamed and erythematous ileocecal valve with ulceration and scar formation (figure 2). Biopsy demonstrated active ulceration with granulation tissue and crypt dropout concerning for CD. A computed tomography scan found diffuse wall thickening extending from the distal ileum to the ileocecal valve consistent with CD (figure 3). The patient was started on a prednisone taper and was discharged on hospital day four. At outpatient follow up the patient was asymptomatic and was started on infliximab and Azathioprine. Repeat ESR and CRP normalized to 11 and 3.6.

Take Home Points:
- Hemophilia affects twenty thousand adults yearly and is rarely associated Crohn’s disease.
- Crohn’s disease presenting with hematochezia warranting transfusions is rare and can suggest a secondary cause.
- 14% of patient with small bowel CD develop perianal disease
- Fistulas can be a presenting symptom for Crohn’s disease and presence should increase suspicion for IBD
- Acute GI bleeds in patients with hemophilia should warrant close monitoring as there is a high risk for deterioration

References:
1. Acute GI bleeds in patients with hemophilia should warrant close monitoring as there is a high risk for deterioration
13. 14% of patient with small bowel CD develop perianal disease
14. Crohn’s disease presenting with hematochezia warranting transfusions is rare and can suggest a secondary cause.
15. Fistulas can be a presenting symptom for Crohn’s disease and presence should increase suspicion for IBD
16. Acute GI bleeds in patients with hemophilia should warrant close monitoring as there is a high risk for deterioration

Image 1: Blood material in colon at 60 cm during flexible sigmoidoscopy
Image 2: Inflamed and erythematous ileal cecal valve with ulceration and scar formation during colonoscopy
Image 3: CT Scan of the abdomen demonstrating distal ileal wall thickening (red arrow)
Pubic Symphysis Septic Arthritis Caused by *Pasteurella multocida*: Report of the First Known Case and Review of the Literature

Brianna L. French MD (Associate), Todd A. Zacour DO, Munshi Moyenuddin MD FACP, Joseph P. Myers MD FACP

From the Internal Medicine Residency Program, Summa Health System/Akron City Hospital, Akron, OH

and the Department of Internal Medicine, Northeast Ohio Medical University, Rootstown, OH

A 79 year old woman presented to the ED with a 3-day history of progressively severe left groin pain with swelling. Pain was exacerbated by lying on her left side and improved with oral naproxen. Patient described to the pubic symphysis ("cuddling with cats!").

Physical examination of the left lower extremity revealed a 1.3 cm x 1.6 cm painful mass centered around the pubic symphysis. Ultrasound-guided operative drainage of subcutaneous/sub-fascial fluid loculations revealed no cat bites, licks, or scratches in recent memory.

**Radiographic and Microscopic Findings**

Microscopic Features: Gram-stained smear of aspirate showed PMNs and Gram-negative bacilli. Cultures of needle aspirate and surgical specimens showed a pure growth of *Pasteurella multocida*. Pre-antibiotic blood cultures remained sterile.

Management: On second day of hospitalization, the patient underwent operative drainage of subcutaneous/sub-fascial fluid loculations. Further history revealed that the patient had one pet cat. The cat had only one tooth remaining and the patient has not been bitten or scratched by the cat. On hospital day 5 the patient required repeat surgical drainage for persistent 1.3 cm x 1.6 cm painful mass centered around the pubic symphysis. Antimicrobial therapy consisted of IV piperacillin/tazobactam (3 days), IV ampicillin/sulbactam (10 days) and oral amoxicillin/clavulanate (5 days). The patient returned to normal with no recurrence at 3 month follow-up visit.

**References**
Cryptococcal Meningitis in a Patient with Chronic Lymphocytic Leukemia on Ibrutinib: An Emerging Risk Factor for Invasive Fungal Infections

Noman Ahmed Jang Khan, MD • Sheetal Higbee, MD • Hassan Mehmood, MD • Rai Shahjehan Dilawar, MD
Internal Medicine Department • Temple University/Conemaugh Memorial Medical Center • Johnstown, PA • conemaugh.org

Introduction

Cryptococcus is a unique environmental fungus that often affects immunocompromised individuals with abnormal cell mediated immunity like Human Immunodeficiency Virus (HIV). Other known risk factors include solid organ or bone marrow transplant patients, patients receiving immunosuppressive agents, and patients with very advanced malignancies. Very few cases of cryptococcal disease have been reported in patients with chronic lymphocytic leukemia (CLL) taking ibrutinib, a newer biological agent primarily affecting humoral immunity by inhibiting the Bruton’s tyrosine kinase pathway; it has shown improvement in progression free survival in recent studies. We here report a case of cryptococcal meningitis in a patient with CLL on ibrutinib therapy.

Case History

A 79-year-old female presented to the emergency department with complaints of headache, fever and malaise. Her past medical history was significant for diabetes mellitus type 2, CLL and hypertension. Medications included metformin, amlodipine and ibrutinib, started recently. Emergent lumbar puncture was planned, and patient was started empirically on vancomycin, ceftriaxone and ampicillin. Cerebrospinal fluid analysis (CSF) was remarkable for WBC count of 296 with 31% lymphocytes, glucose low at 35, protein elevated at 120, negative HSV PCR and positive cryptococcal antigen with a titer of > 1:40.

She was started on liposomal amphotericin B with IV flucytosine. CSF culture eventually grew Cryptococcus neoformans susceptible to amphotericin B [Figure 1]. Patient showed significant improvement in her symptoms and the two week follow-up CSF analysis was unremarkable with negative cryptococcal titers and culture. Patient was placed on a maintenance dose of fluconazole.

Discussion

Cryptococcal meningitis usually presents indolently over a period of a week or two with fever, malaise, headache and occasionally cranial neuropathies. The presence of cough, skin rash and dyspnea suggest a disseminated disease. The definitive diagnosis of cryptococcal meningoencephalitis is made by culture of the organism from CSF. The presence of cryptococcal polysaccharide antigen titers are strongly suggestive of infection, very well before the cultures become positive, particularly in high risk patients. Induction therapy with liposomal amphotericin B and flucytosine followed by maintenance therapy with fluconazole is the standard of care.

Conclusion

Cryptococcal meningoencephalitis should be part of the initial differential diagnosis in patients with CLL taking ibrutinib coincident with suggestive clinical features. Prompt diagnosis and early treatment may prevent fatal consequences.

References

INTRODUCTION:

Blastomycosis is an infection caused by fungus Blastomyces. It is endemic in Ohio-Mississippi river valley and upstate New York. We present the case of severe pulmonary Blastomycosis in a middle aged immunocompetent grain inspector.

CASE PRESENTATION:

55 year old male with no significant past medical history who works as imported organic grain inspector for government presented to us with two day history of sudden onset shortness of breath, dry cough and high grade fever. Patient recently had inspected the wheat imported from Africa, since then he started having symptoms. CXR was concerning for multifocal consolidation. White count was 22000, lactic acid was normal. Patient was initially thought to have community acquired pneumonia and was started on IV antibiotics. However he declined over next few days and developed severe acute hypoxic respiratory failure requiring intubation and mechanical ventilation.

Work up including CT angiography was negative for pulmonary embolism. Blood cultures were negative. Urine strep and pneumococcus were negative. Due to concern for possible autoimmune pneumonitis he was started on IV steroid, however he declined more.

CT scan chest with contrast: Showing extensive diffuse nodular infiltrates and consolidation in both lungs is likely infectious/inflammatory in etiology. There is associated minimal bilateral pleural effusion. A few enlarged mediastinal lymph nodes are likely reactive.

Chest X-ray: There is diffuse interstitial/airspace opacities

Autoimmune work up including DsDNA, C3, C4, anti-SSA, SSB, anti-u1rNP, anti-cCP, ANCA, scl-70, anti-smooth muscle ab, Polymyositis antibodies, Hypersensitivity pneumonitis panel, aldolase, TSH, HIV screen, Lyme panel, serum fungitel, respiratory viral cultures, blood cultures were negative. Bronchoscopy with BAL was done and specimen were sent for the cytology, antigen testing and culture.

BAL aspergillus, fungitel, Flow cytometry and Cytology were negative, however BAL culture grew Blastomycosis colonies. Patient was started on Amphotericin B. Due to severe Hypoxic respiratory failure requiring ECMO, patient was transferred to University of Rochester where he died over next 2 days.

DISCUSSION:

Pulmonary Blastomycosis can present with wide range of symptoms and usually require high clinical suspicion for the diagnosis. Previously reports have shown that diagnosis of Pulmonary Blastomycosis have been delayed due to initial presentation with variety of symptoms which resemble other diseases. We suggest that patient from Blastomycosis endemic area should be evaluated for the possible pulmonary Blastomycosis as early intervention may be helpful.

REFERENCES:

Introduction

- Pasteurella multocida is known for causing skin and soft tissue infections following animal bites.
- Invasive Pasteurella infections have been reported following non-bite animal contacts, especially in patients with impaired host defenses.
- We describe a case of Pasteurella multocida meningitis with a complicated hospital course.

Case Presentation

- **History of present illness:**
  A 65-year-old Caucasian female patient presented to the hospital with a four-day history of altered mental status associated with fever, nausea, and generalized weakness. Before admission, she was found wandering inside her house confused, naked, and covered with cat feces.

- **Past medical history:**
  Chronic obstructive lung disease and alcoholic liver disease.

- **Social history:**
  Smokes tobacco and consumes alcohol daily. She lived in a trailer with her boyfriend and twenty-five domestic and stray cats.

- **Vital signs:**
  - Temperature: 36.5°C
  - Blood pressure: 99/60 mmHg
  - Heart rate: 114 beats per minute
  - Respiratory rate: 20 breaths per minute
  - O2 saturation: 97% on room air

- **Physical exam:**
  - General: Lethargic and disoriented
  - Neurological: No focal neurological deficit
  - Skin: Unremarkable with no scratches or bites
  - The rest of her physical exam was unremarkable

- **Pasteurella multocida** is known for causing skin and soft tissue infections following animal bites.
- **Invasive Pasteurella infections** have been reported following non-bite animal contacts, especially in patients with impaired host defenses.

- **We describe a case of Pasteurella multocida meningitis with a complicated hospital course.**

Labs and Imaging

- **Initial labs**
  - WBC: 30.6 x 10^9/L
  - Lactate: 2.7 mmol/L
  - Procalcitonin: 1.51 ng/mL
  - Urine toxicity screen: Negative
  - Blood culture: Pasteurella multocida

- **Cerebrospinal fluid (CSF) analysis**
  - WBC: 5817/mm³
  - Protein: 1188 mg/mL
  - Glucose: 40 mg/dL
  - Urine toxicology screen: Negative
  - CSF culture: Pasteurella multocida

- **CT of the head without contrast:** No acute abnormalities.

- **MRI of the brain:**
  Proteinaceous fluid suggestive of pus inside the lateral ventricles

Hospital Course

- The patient was admitted to the intensive care unit as her mental status deteriorated and she was intubated for airway protection.
- She was started on IV ceftriaxone and initially improved.
- Her hospital course was later complicated with ventilator-associated pneumonia secondary to Pseudomonas aeruginosa, acute heart failure with low ejection fraction, and left ventricular thrombus.
- Ceftriaxone was modified to ceftirixime, and anticoagulation was started with IV heparin infusion.
- After 10 days of antimicrobial therapy, the patient’s mental status did not improve.
- Therapy was escalated and intraventricular access was obtained. Intraventricular gentamicin was given for a total of 7 days.
- Her mental status slowly improved and she was later extubated. Unfortunately, her mental status did not return to baseline at the time of hospital discharge.

- **Initial labs**
  - WBC: 30.6 x 10^9/L
  - Lactate: 2.7 mmol/L
  - Procalcitonin: 1.51 ng/mL
  - Urine toxicity screen: Negative
  - Blood culture: Pasteurella multocida

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  - WBC: 5817/mm³
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  - Glucose: 40 mg/dL
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- **CT of the head without contrast:** No acute abnormalities.

- **MRI of the brain:**
  Proteinaceous fluid suggestive of pus inside the lateral ventricles

Discussion

- This case illustrates how Pasteurella multocida can be transmitted from animals to humans even in the absence of bites or scratches. The organism is a rare cause of meningitis but should be considered in patients with impaired host defenses (e.g., liver disease) and history of non-bite animal exposure.

References

**Skin complaints are common in general medicine**

- Adverse cutaneous reactions to drugs affect 2-3% of hospitalized patients.
- Accurate and prompt diagnosis is important because some rashes can be life-threatening and treatment varies depending on the etiology.

**62 year old man on antibiotics developed a groin rash in the hospital**

**HPI:** He had a prosthetic aortic valve with recent infective endocarditis, on IV ceftriaxone. He presented with 2 weeks of fever, malaise, and myalgia.

**Allergy:** Past penicillin allergy. Negative patch test 2 years ago.

**Exam on admission:** 3/6 systolic murmur at right upper sternal border.

**Lab on admission:** Leukopenia.

**Hospital course:** His antibiotic was changed to IV penicillin G in the setting of possible drug fever secondary to ceftriaxone and leukopenia. He developed a pruritic rash at his groin within 15 minutes of infusion.

**Image 1. Groin Rash**

(A) Picture taken the morning after rash development showing well demarcated erythema at the upper inner thighs
(B) Day 2 of the rash, showing improvement

**Table 1. Comparing Baboon Syndrome and SDRIFE (Systemic drug related intertriginous and flexural exanthema)**

<table>
<thead>
<tr>
<th></th>
<th>Baboon Syndrome</th>
<th>SDRIFE</th>
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<tbody>
<tr>
<td>Etiology</td>
<td>Metals, medications, plants</td>
<td>Antibiotics, predominantly beta-lactams</td>
</tr>
<tr>
<td>Previous cutaneous sensitization</td>
<td>Yes</td>
<td>Not found</td>
</tr>
<tr>
<td>Patch test</td>
<td>Positive</td>
<td>Negative in 50% of cases</td>
</tr>
</tbody>
</table>

**Baboon syndrome/SDRIFE is a self-limiting rash**

- It is a sharply demarcated V-shaped erythema of the buttocks, upper inner thighs and axilla without systemic symptoms.
- The most common causes are beta-lactam antibiotics.
- Treatment includes discontinuing the suspected medication and topical/oral corticosteroids.

**Key Point**

**Baboon syndrome** is a delayed type hypersensitivity reaction (type IV) by non-cutaneous exposure to an allergen in a patient who is previously cutaneously sensitized. When there is no known previous cutaneous exposure, it is diagnosed as SDRIFE.

**References**

- Häusermann, P., Th Harr, and A. J. Bircher. "Baboon syndrome resulting from systemic drugs: is there strife between SDRIFE and allergic contact dermatitis syndrome?." *Contact dermatitis* 51.5-6 (2004): 297-310.
Background

- Acid base disturbances have a complex interplay in Diabetic Ketoacidosis (DKA).
- Substance abuse in DKA is associated with more severe metabolic acidosis with higher acidosis-ketosis gap (AKG).
- Severe hypernatremia and alkalosis are rare in DKA but were exhibited in our case.

Case Report

A 31-year-old female with Type 1 diabetes and schizophrenia was hospitalized after she was found to be minimally responsive at home. Severe dehydrated, obtunded and only responsive to painful stimuli on admission. Initial biochemical findings:

- Serum Glucose: 966 mg/dl (n 70-140 mg/dl)
- Serum Bicarbonate: 6.5 mmol/L (3.5-5 mmol/L)
- Serum Potassium: 4.0 mEq/L (2.2-28 mEq/L)
- Anion Gap: 32 mEq/L (n 22-28 mEq/L)
- Serum Chloride: 38.4 (n 23-27)
- Delta Gap: 389 mOsm/Kg (n 275-295 mOsm/Kg)
- pCO2: 37.17 mg/dl (n <=4.17 mg/dl)
- pH: 7.40 (n 7.31-7.41)
- Corrected Sodium: 4.5 (n 136-148 mEq/L)

She was adequately managed for DKA in the ICU and was discharged on subcutaneous insulin.

Discussion

- Our patient exhibited mixed:
  I. Metabolic acidosis (elevated anion gap, ketonemia)
  II. Metabolic alkalosis (elevated bicarbonate, elevated delta gap)
  III. Compensatory respiratory acidosis.

- Osmotic diuresis due to glycosuria and amphetamine abuse (via hyperosmotic, excessive sweating and inadequate fluid intake) led to severe volume depletion and bicarbonate reabsorption leading to severe contraction alkalosis.

- Studies have shown that methamphetamine use leads to elevated plasma cortisol and corticosterone levels via hyperactivation of the hypothalamic-pituitary-adrenal axis.

- 3,4-Methylenedioxymethamphetamine (MDMA)/Ecstasy use has been shown to cause an acute increase in cortisol levels of around 150% in sedentary humans and 800% in dance clubbers.

Conclusions

- There is frequent association between decompensated diabetes and illicit drug use.
- Substance abuse should be suspected in young Type 1 diabetics presenting with recurrent hyperglycemic emergencies especially with atypical biochemical features.

Learning Objectives

- Normal or alkaline pH on presentation can mask underlying diabetic ketoacidosis leading to delay in diagnosis and treatment.
- Attention should be paid in such cases to elevated anion gap, ketonemia and delta-delta gap ratio.
- Young Type 1 diabetics presenting with recurrent DKA/HHS especially with atypical acid-base disturbances should be screened for illicit drug use, notably amphetamine analogues and cannabis.

References


Figure 1: The major cellular and luminal events in bicarbonate reabsorption in proximal tubules (left panel) and bicarbonate reabsorption and generation in the collecting tubules (right panel). CA: Carbonic anhydrase; HCO3: Bicarbonate; CL: Chloride; H2CO3: Carbonic acid; GR: Glucocorticoid receptor; MA: Methamphetamine; MR: Mineralocorticoid receptor; PIP2: Phosphatidylinositol 4,5-bisphosphate; ACTH: Adrenocorticotropic hormone; CRF: Corticotropin-releasing factor; AVP: Arginine vasopressin; HPA: hypothalamic-pituitary-adrenal axis. Final Neuroscience. 2015(3):178.
Reducing Inappropriate Telemetry Utilization on an Internal Medicine Teaching Service

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Introduction

- Inappropriate cardiac telemetry use creates excess expense, alarms, work for nursing, as well as being a burden for patients
- Hospitals are also limited on the availability of cardiac telemetry which as a result can restrict patient flow
- Previous studies have shown that monitored beds are often occupied by patients who might only require frequent nursing care and monitoring rather than cardiac monitoring (1), and very few patients had clinically meaningful telemetry events (2)
- Mercy Hospital has 64 Telemetry Beds for Med/Surg Patients on 7th and 11th Floors
- Cost of Telemetry Bed is approximately $1,200 Compared to $900 for GMF Bed Daily.
- Telemetry bed is usually available within 2 hours to as long as 3 days while general medical bed takes an hour to a day for them to be available. Lack of telemetry bed availability delays patient transfer
- AHA released a scientific statement (2017) which provides recommendations, indications, duration and implementation of continuous electrocardiographic monitoring of hospitalized patients.

Objective

- Based on the updated 2017 AHA Guidelines, we conducted a Quality Improvement project: (1) to assess adherence to these AHA guidelines and (2) to implement an educational intervention within our hospital to reduce inappropriate telemetry use among General Medicine teaching services (3) improve patient flow within the hospital

Methods

- Pilot: General Medicine teaching service at Mercy hospital (average census of 40-50/day)
- Baseline data collection of telemetry use: daily manual chart review over 30 days in December 2017.
- A secondary outcome of patient flow, transfers out of ICU were evaluated for potential delays by manual chart review
- Intervention: Two educational case-based conference given to all available IM residents and one informational session given to IM core faculty members

Results

- A total of 960 patient days, 383 pre-intervention and 577 post-intervention were evaluated for telemetry appropriateness
- The proportions of patients inappropriately on Tele significantly decreased (67% to 57% p=0.002), corresponding to 3.3 patients/day (See figure 1).
- Overall number of patients on Tele per day significantly decreased from 25.5 to 21.4 (p=0.006)
- Estimated cost savings $1230/day or $448,950 annually
- For secondary outcome of patient flow, proportions of hours of delay due to Tele bed availability compared to GMF significantly decreased (64% vs 41%, p <0.001)
- Average transfer time delay due to Telemetry bed availability per day trended down (7.2 vs 4.7, p=0.36)
- Overall transfer time delay out of ICU did not change from before to after intervention (11.2 vs 11.5, p=0.95)

Conclusion

- A brief educational intervention significantly decreased inappropriate Telemetry use for patients cared for by IM residents
- Time delays in transfers from ICU to Tele beds improved following resident education but did not change overall time in transfer delays
- Further study is needed to evaluate the sustainability of intervention and hospital-wide effects of implemented practice changes on patient flow

References

Continuous supplemental oxygen usage in this population may paradoxically prolong life expectancy in some patients who are not hypoxic.

**Case Presentation**

- A 63 year old woman with stage 4 ovarian and colon cancer with severe biliary obstruction was admitted to inpatient hospice after not responding to multiple treatment protocols with an expected life expectancy of no more than a few days.
- Her vital signs were stable, although she continued to have uncontrolled generalized pain, vomiting, and persistent weight loss. She denied respiratory symptoms and had no difficulties with breathing, eating, or sleeping.
- Comfort care medications were initiated including a morphine PCA pump, scopolamine, bisacodyl and oxygen at 2L/min. Vital signs were measured during each nursing shift change.
- Her vital signs remained stable despite a progressive functional decline and increased generalized pain. She was able to continue to verbally communicate her wishes before becoming increasingly worsening encephalopathy while continuing to tolerate her comfort care medications well.
- Meanwhile, her family sustained continuous psychological and emotional stress during this time including increased fatigue and caregiver burnout.
- Oxygen supplementation was discontinued by the family, resulting in a rapid decline in her previously stable vitals, especially oxygen saturation. The patient expired 1 day later after 27 days while in inpatient hospice care.

**Introduction**

The goals of care for inpatient hospice patients is symptomatic management and comfort care. Conventional use of additional measures including fluid hydration and supplemental oxygen is patient specific, but typically used in many cases due to "intuition of benefit."

**Results**

- Prior to supplemental oxygen usage, the patient’s oxygen saturation and MAP remained fairly stable at >95’s and >60’s respectively.
- An increase in her supplemental oxygen was utilized during later phases while her vital signs remained stable.
- A rapid decline in oxygen saturation and MAP was noted following discontinuation of supplemental oxygen usage, corresponding to eventual patient demise.
- A positive Pearson’s correlation (r = +0.59) was noted between supplemental oxygen usage and oxygen saturation.
- A positive Pearson’s correlation (r = +0.59) was noted between supplemental oxygen usage and oxygen saturation.
- Likewise, a neutral Pearson’s Correlation (r = -0.03) was noted between supplemental oxygen usage and MAP.

**Limitations**

- Although there appears to be evidence of correlation between dependency of supplemental oxygen usage and rapidly declining health, study limitations and confounders in this situation include:
  - Patient’s advanced metastatic cancer status
  - Familial factors including caregiver stress that may contribute to interventions that affect prognosis.
  - Limited diagnostic testing due to comfort care status
- More studies would be required to further test this hypothesis; however, further test would be limited due to:
  - Variability in disease prognosis.
  - Potential ethical consideration and accountability of testing against the patient’s best interests.

**Conclusion**

- Supplemental oxygen usage in palliative care and hospice environment has been a controversial topic on the setting of anticipated end-of-life scenarios.
- Previous studies have been ambiguous regarding its usage in patients with terminal illness barring "intuition of benefit."
- Supplemental oxygen usage may paradoxically prolong the life expectancy of terminal ill patients as in this situation. Results indicate that there may be a level of correlation between oxygen usage and O2 saturation. Likewise, oxygen usage appears to be inversely correlated with heart rate and independent of MAP.
- Mechanisms of prolongation may due to dependent respiratory drive with supplemental oxygen flow, but more studies are needed.
- Further studies may be warranted, but we recommend conservative oxygen usage in hospice patients only when associated with discomfort due to dyspnea.

**References**

A 70 year old female presented due to abdominal discomfort and unintentional weight loss and night sweats. Her past medical history and family history were unremarkable.

Computed Tomography (CT) revealed a heterogeneous lesion suspicious for malignancy.

Biopsy was consistent with intrahepatic cholangiocarcinoma.

Paracentesis was performed due to her abdominal discomfort and large ascites.

Microscopic examination of the peritoneal fluid showed that the malignant cells did not resemble an origin of adenocarcinoma (Figure C) which prompted to call for a multidisciplinary meeting to address this observation.

It was concluded to proceed with flow cytometry which was consistent with diffuse large B cell diffuse lymphoma (DLBCL)

A thorough review of the literature of treatment strategies was presented in a multidisciplinary team meeting.

The patient was started on Gemfibrozil, Cisplatin and Rituximab.

On 1 year follow up the patient showed remission of both malignancies.

Genetic testing was offered but patient declined.

CONCLUSION

• Effective multidisciplinary team work improves accurate diagnosis, management and survival (1)
• Synchronous malignancies are not uncommon and not always associated with family history
• Physicians should advocate for multidisciplinary planning especially in the field of oncology (2)
• Histopathological and clinical correlation are very important for diagnosis of malignancies
• Multidisciplinary approach and through literature search are warranted in synchronous cancers as the limited number of observations does not allow for randomized controlled trials (3, 4)

Stop Calling Me Crazy!
The Unusual Course of NMDA-Receptor Encephalitis

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Introduction
Autoimmune encephalitis occurs when antibodies are produced against healthy brain receptors. This can manifest as acute neurologic and/or psychiatric symptoms. Antibodies to the N-methyl-D-aspartate (NDMA)-receptors are the most common cause.

Case Report
A 54-year-old female presented with status epilepticus. Two weeks earlier she had been committed to a psychiatric unit with confusion, non-orientation, inability to follow commands and non-sensical repetitive statements that had developed over one month. Her mentation deteriorated until she became catatonic and developed seizures. She was intubated and admitted to the ICU.

Brain MRI and whole-body CT did not demonstrate evidence of tumor. EEG was without epileptogenic foci. Lab findings are shown in table 1. She received five-days of high-dose solumedrol and five-days of intravenous immunoglobulin (IVIG). She began weekly treatment with Rituximab, which improved mentation. She remained encephalopathic with oral-lingual-facial dyskinesia and dysautonomia. She began weekly neuroendocrine investigations and admitted to the ICU.

After several weeks of rehabilitation, symptoms persisted. Antibodies to the NDMA-receptors are the most common cause. They can result in anesthesia and neuropsychiatric dissociation.

Take Home Messages
1) This condition initially manifests as acute psychosis – do not commit patients to psychiatric wards!
2) Clinical suspicion and anticipation of disease stage is imperative for prompt initiation of therapy with IV steroids and immunoglobulin.

References

Table 1. Laboratory Results

<table>
<thead>
<tr>
<th>Routine Chemistry</th>
<th>CSF Analysis (on admission)</th>
<th>(post treatment)</th>
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<tbody>
<tr>
<td>Complete Blood Count</td>
<td>10.4</td>
<td>5.8</td>
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<tr>
<td>Metabolic Panel</td>
<td></td>
<td>145</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.0</td>
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<td>Other Results within normal limits</td>
<td>TSH</td>
<td>HIV screen</td>
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<td>Bloody</td>
<td>Enterovirus</td>
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<td>RBCs</td>
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<td>Oligoclonal Bands</td>
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<td>VGKC Ab</td>
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<tr>
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<td>Protein</td>
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<tr>
<td>Protein</td>
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<td>Cryptococcal Ab</td>
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</tr>
<tr>
<td>West Nile Ab</td>
<td>Not detected</td>
<td>NMDA-receptor Ab</td>
</tr>
</tbody>
</table>

Figure 1. Pathophysiology & symptomatology of NMDA-receptor antagonism

Figure 2. Four stages of NMDA-receptor encephalitis

Discussion
The NMDA receptor is an ionotropic protein found on nerve cells and can be bound by glutamate, glycine and NMDA. Overexcitation is associated with neurodegenerative disorders, while antagonism can result in anesthesia and neuropsychiatric dissociation. When autoantibodies antagonize the NMDA receptors:

1) GABAergic neurons are disinhibited (Figure 1)
2) Nuclei of Kölliker-Fuse are directly altered
3) Homeostasis of other systems is disrupted

Diagnosis requires CSF and high clinical suspicion:

- Highly specific autoantibodies (Table 1)
- Lymphocytic pleocytosis and oligoclonal bands

Many patients undergo extensive infectious disease workup, which ultimately delays treatment. NMDA-receptor antibodies disappear from CSF after treatment initiation; however, symptoms often persist. Acute and prolonged deterioration in mental status is common. Even after recovery, there are significant cognitive and behavioral abnormalities requiring rehabilitation (Figure 2).
Introduction

- Mucormycosis is a rare but serious fungal infection caused by environmentally ubiquitous mold classically associated with infections of the head, sinuses, orbits, and cerebrum.
- It primarily affects immunocompromised individuals.
- Mucormycosis frequently presents as non-specific symptoms leading to delayed diagnosis and increased mortality.
- Management guidelines largely limited to retrospective review, pre-clinical animal studies, and expert opinion.

Case Presentation

- 62 year old female with myelodysplastic syndrome with conversion to acute myeloid leukemia who underwent pre-stem cell transplant conditioning.
- Post-conditioning she developed neutropenic fever and enteritis for which she underwent full infection work-up including sigmoidoscopy.
- Sigmoidoscopy demonstrated diverticulosis and biopsy was negative for fungal elements.
- She initially recovered otherwise uneventfully and was discharged with plans for stem cell transplant.

Clinical Course

- Haploidentical stem cell transplant (HSCT) one month later with hospital course complicated by fever, abdominal pain, and decreased stool output.
- Initial abdominal computed tomography (CT) demonstrated 4.9 cm perirectal abscess (Image 1) with cytology of abscess aspirate revealing fungal hyphae despite taking prophylactic posaconazole.
- CT imaging of sinus, head, and chest negative for other foci of infection.
- Negative serum (1,3)-beta-D-glucan and galactomannan. Culture of aspirate grew Rhizopus arrhizus (Image 2A).
- Liposomal amphotericin B and micafungin initiated with surgical debridement via proctosigmoidectomy with colostomy.
- Histopathology on the surgical specimen revealed branching fungal elements with vascular thrombosis and necrosis (Image 2B,C).
- Despite surgery and antifungals, she developed rapid recurrence of disease confirmed on CT abdomen and pelvis.
- After discussion regarding further surgery and poor prognosis, she was discharged on palliative isavuconazole with post 4 month surveillance demonstrating interval improvement of disease (Image 3).

Discussion

- Gastrointestinal mucormycosis represents 7%-8% of all mucormycosis cases with the stomach being the most commonly affected followed by colon and ileum.
- Gastrointestinal mucormycosis clinical manifestations are diverse and non-specific (i.e. nausea, vomiting, diarrhea, obstruction, perforation).
- Antemortem diagnosis occurs in 25% of cases with mortality as high as 85% secondary to delayed diagnosis.
- Risk Factors: immunocompromise, malnourishment, prematurity in neonates, steroid and biologic use
- Route of entry: ingestion or exposure to contaminated material within or outside of hospital
- No commercial blood antigen or polymerase test to rapidly detect mucormycosis
- Definitive diagnosis requires recovery of fungal elements
- 2013 European Society for Clinical Microbiology and Infectious Disease (ESCMID) Guidelines recommend combined surgical debridement and liposomal amphotericin B.
- Per ESCMID guidelines, salvage therapy with posaconazole is recommended in refractory disease or amphotericin intolerance.
- Pre-clinical data and small retrospective studies supportive of combination amphotericin and echinocandin therapy, though more recent, larger studies cast doubt on efficacy of combination therapy.
- This case reveals the potential for isavuconazole as salvage therapy.

Conclusion

- Improvement in mortality relies on high index of suspicion and early intervention
- Diagnostic and therapeutic innovations are needed to improve outcomes
- More clinical data is needed to validate the potential use of isavuconazole as salvage therapy

References

Sliding back: retrospective histopathologic diagnosis of cervicothoracic pain

Case

Initial Presentation: A 54-year-old male presented with 2 months of isolated upper back pain. He was initially diagnosed with musculoskeletal back pain, until he developed progressive pain and lower extremity neurologic findings that improved with corticosteroids. Lab work-up was non-revealing and notable only for slight ESR elevation, p-ANCA/MPO without vasculitis evidence, and B12 deficiency.

Labs/Studies:

- ESR 30 (minimally 1)
- p-ANCA/MPO (without vasculitis evidence)
- LVID

Course: MRI revealed normal brain and C7-T5 epidural mass, consistent with hematomas. He initially deferred surgery because symptoms improved with steroids but eventually underwent laminectomy and biopsy, which showed fibrotic tissue. His neurologic deficits worsened, and repeat MRI confirmed mass progression. He re-presented with worsening back pain and new headaches. Retrospective immunohistochemical staining revealed dense IgG4-positive plasma cell infiltrate.

Diagnosis: IgG4-related hypertrophic pachymeningitis (IgG4-RHP)

Therapy: Following 11 corticosteroid courses, he started steroid-sparing B-cell depletion and weaned off steroids without further radiographic disease progression.

Care Team: Multidisciplinary diagnosis and treatment ultimately included primary care, neurosurgery, radiology, rheumatology, physical medicine and rehabilitation, pathology, anesthetics, and neurology.

IgG4-Related Disease

IgG4-related disease (IgG4-RD) is a systemic fibroinflammatory disorder characterized by particular histopathology: (1) Dense lymphoplasmacytic infiltrate, (2) fibrosis with at least focal storiform (regularly warded, basketweave) pattern, (3) obliterative phlebitis. Similar to sarcoidosis, it is a multi-system disease linked by common histologic features, but the most commonly affected organs are the pancreas, bile duct, and salivary and lacrimal glands. Fibrotic masses are commonly present.

Pathophysiology is poorly understood but may involve a presently unidentified antigen activating IgG4-4 plasma cells that further activate CD4+ T cells to produce interleukins and recruit eosinophils and macrophages while activating fibroblasts. It is unclear whether IgG itself plays a pathogenic role. IgG4 serum levels may be elevated, but diagnosis relies on histopathology in an appropriate clinical context. Treatment role varies by symptoms but is indicated for neurologic deficits.

IgG4-Related Hypertrophic Pachymeningitis

To our knowledge, this represents the 12th reported case of IgG4-RHP, a rare cause of back pain. Hypertrophic pachymeningitis refers to dura mater inflammation and thickening that can also be caused by conditions including infection, tumor, and sarcoidosis. It can progress to involve back pain and spinal cord compression.

Early treatment may prevent permanent neurologic impairment. Treatment data are limited and generally involve initial corticosteroids, but B-cell depletion has therapeutic promise. The major goal of therapy is prevention of new fibrosis because existing “burnt out” scar tissue is not responsive to anti-inflammatories.

Figures: (1) T2-weighted MRI: cervical spine showing thoracic mass initially suspicious for hematomas—later recognized as fibrosis—consistent with normal proximal cervical spine. (2) Continued thoracic signal abnormality with new severe spinal canal stenosis and cord compression C3-C6 with possible hydrameninx. (3) Follow-up 2 months after initial B-cell depletion showing stable pachymeningeal thickening and cord compression but without myelomalacia, consistent with stable, non-progressive fibrosis. (4) Dural mass histopathology with extensive fibrosis with lymphoplasmacytic infiltrate on hematoxylin and eosin. (5) Immunohistochemistry showing clustering of IgG4-positive plasma cells at 40x magnification, up to 25hpf.

Corticosteroid Bursts... ...and tapers:

<table>
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<tr>
<th>Year</th>
<th>Events</th>
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<tr>
<td>Fall 2016</td>
<td>Initial Presentation</td>
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<tr>
<td>2017</td>
<td>MRI 1</td>
</tr>
<tr>
<td>2018</td>
<td>Rheumatology Consultation</td>
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<tr>
<td>2019</td>
<td>Off Steroids</td>
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Back Pain Onset: Initial Presentation | MRI 1 | Laminectomy/ Biopsy | Neurologic Deficits/MRI |

IgG4 Stains/Diagnosis | B-cell Depletion #1 |

MRI 3
Heparin-induced thrombocytopenia (HIT) is a well-known complication of treatment with heparin. Thrombocytopenia is the most common manifestation of HIT, but it can cause catastrophic arterial and venous thrombosis with a mortality as high as 20 percent.

Bleeding is rarely seen in HIT but has been reported. We present a case of HIT with portal and splenic vein thrombosis, found to have bilateral adrenal hemorrhage. That patient was started on IV dexamethasone, and all heparin products were discontinued.

Case Presentation:
A 63-year-old female presented with abdominal pain, nausea, vomiting, and constipation. CT scan showed evidence of sigmoid volvulus. She underwent subtotal colectomy and was later discharged against medical advice.

She spiked a fever on day six. Cefepime was started for possible intra-abdominal infection. On day nine, CT scan of the abdomen (Figure 1,2) revealed portal and distal splenic vein thromboses, and bilateral adrenal hemorrhage. That evening, she spiked a fever again and became hypotensive.

Lab work revealed a drop in platelet count to 122,000 from 328,000 at time of admission. Her 4T score was calculated to be 7 indicating a high probability of HIT and her morning cortisol level was 1.8µg/dL consistent with adrenal insufficiency. She was started on intravenous bivalirudin and was later anticoagulated with warfarin.

HIT ELISA assay was positive for anti-platelet factor 4 (PF4)-heparin antibody with optical density of 2.2, and a diagnosis of HIT was made.

She was started on intravenous bivalirudin and was later anticoagulated with warfarin. She was eventually discharged home with warfarin, fludrocortisone, and hydrocortisone.

Discussion
HIT causes anti-PF4-heparin antibody mediated thrombocytopenia resulting in acquired hypercoagulability syndrome which leads to arterial and venous thrombosis. Hemorrhage is uncommon in HIT but has been reported.

In a series of 6332 patients hospitalized with HIT, bleeding was seen in 6 percent of patients. This study did not report whether bleeding was due to thrombocytopenia from HIT or to anticoagulation for HIT treatment. [1]

Interestingly, our patient was found to have both venous thrombosis and bilateral adrenal hemorrhage.

Bilateral adrenal hemorrhage in HIT could be due to thrombocytopenia itself or as a result of acquired hypercoagulability syndrome. The distinctive vascular architecture makes adrenals vulnerable to adrenal vein thrombosis complicated by hemorrhagic transformation. Ironically, the hemorrhage is treated as a thrombotic disorder, and patients require anticoagulation and adrenal replacement therapy. [2]

Conclusion
Bilateral adrenal hemorrhage is a rare complication of HIT. Unrecognized adrenal hemorrhage secondary to HIT can lead to significant mortality due to adrenal and hemodynamic collapse. Based on 14 articles describing 17 cases, the overall mortality rate is 27.8%, and 100% mortality in three cases where adrenal insufficiency went unrecognized. [3] Clinicians should maintain a high index of suspicion to achieve prompt diagnosis to provide life-saving treatment.

References
Introduction:
Infective endocarditis (IE), a life-threatening condition carrying a mortality rate of 30%, seldom presents as right-sided infective endocarditis (RSIE). Such cases are overwhelmingly associated with intravenous drug use (IVDU).

IE can occur on any surface of the heart's lining and vegetation is monitored via echocardiography. Below, we discuss an interesting case of RSIE with a high-risk follow-up echocardiogram in a non-IVDU.

Case Description:
A 62-year-old female with a past medical history of diverticulitis presented with 5 days of fever, chills, and lumbago. On arrival, the patient was noted to be tachycardic (142), tachypneic (35), and febrile (103.2°F) with a blood pressure of 95/47 mmHg. Physical examination was unremarkable. She denied IVDU.

Labs showed pancytopenia with White Blood Cells 2.4 Thou/µL, Red Blood Cells 4.10 Mill/µL, Platelets of 29 Thou/µL. She also had an elevated lactate (3.9mmol/L). Urine drug screen was negative.

The patient was admitted to the Intensive Care Unit for septic shock where she was treated with broad-spectrum antibiotics and fluid resuscitation. Blood cultures grew Cefazolin-sensitive Beta Hemolytic Streptococcus B.

A transthoracic echocardiogram (TTE) did not reveal valvular vegetation and she refused a transesophageal echocardiogram (TEE). An MR Lumbar Spine, obtained for lumbago, demonstrated early septic arthritic changes in the posterior left facets of L3 and L4. She was discharged on a 6-week course of Ceftriaxone. While in-house repeat blood cultures remained negative, the patient was readmitted the following week with similar symptomatology. CT Chest revealed lower lobe pulmonary emboli with right heart strain, which prompted a TEE. A 1.7 x 1.2 cm vegetation on the mid-basal posterior leaflet of the tricuspid valve was identified and its presence was confirmed on Cardiac MRI. Antibiotics were optimized to ampicillin and gentamicin, as per infectious disease recommendations. Following 6 weeks of antimicrobial therapy, a repeat TEE performed demonstrated an unchanged vegetation.

Discussion:
RSIE, accounting for 5-10% of all IE, is strongly associated with IVDU in addition to defibrillator/pacemaker leads and dialysis catheters, none of which existed in our patient. Moreover, our patient's cultures grew Streptococcus, which is a rare cause of RSIE (50-80% of cases are Staphylococcus aureus). Follow-up of vegetation are usually performed by TTE or TEE. Although frequency and timing of these studies are based on the type of microorganism, initial findings, and response to therapy, they are commonly performed after 7 days and upon completion of the antibiotic course. It is important to remind ourselves that close monitoring of vegetation size is vital in IE patients, as an increase in size or failure to regress, despite antibiotic therapy, is a strong predictor of mortality and embolic events, as evidenced by this case.
Diffuse Large B Cell Lymphoma mimicking ST Elevation Myocardial Infarction

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1. Department of Internal medicine; 2. Department of Cardiovascular Medicine; 3. Department of Med-Peds Medicine; 4. Department of Pathology

Introduction
Primary cardiac lymphoma is a rare and difficult to diagnose disease due to nonspecific symptoms. Secondary infiltration is more commonly seen in 25% of patients with disseminated disease, most notably in the immunocompromised population. Typically, these patients present with dyspnea on exertion, angina, atrioventricular (AV) block, and constitutional symptoms. We present a case of a 59-year-old immunocompetent man who presented with rapidly progressive cough found to have ischemic changes on his electrocardiogram (ECG).

Case
- 59-year-old Caucasian Male
- Past medical history:
  - Hypertension
  - Insulin-dependent diabetes
  - Tobacco abuse
  - Microcytic anemia
- Chief Complaint:
  - Progressively worsening non-productive cough for two months.
- ROS:
  - Dyspnea on exertion
  - Fatigability
  - 10-pound weight loss
  - No chest pain or pressure, palpitations, neck or arm pain, diaphoresis.
- Physical Exam:
  - Hemodynamically stable, diminished bibasilar lung sounds, and central obesity.
- Laboratory Results:
  - Hemoglobin of 13.0 g/dL, MCV of 77.4 fL
  - Calcium of 14.0 mg/dL
  - Pro-BNP of 4577 pg/mL
  - Calcium of 14.0 mg/dL
  - Pro-BNP of 4577 pg/mL

Hospital Course and Beyond
- Medication and Therapy:
  - Aspirin and intravenous unfractionated heparin
  - No Cardiac Catheterization
- Imaging:
  - Non-contrast Chest CT scan: Remarkable for cardiomegaly, large pericardial effusion, diffuse soft tissue nodules and thickening in the pericardium, and a confluent mediastinal, right hilar, perihilar and left hilar lymphadenopathy.
  - Transthoracic Echocardiogram: Right ventricular and bi-atrial enlargement with thickening in the AV groove between the right atrium and ventricle.
- Cardiac Magnetic Resonance:
  - Multiple mass-like lesions within the pericardium, the largest measuring 63 mm x 40 mm encasing the right coronary artery and evidence of myocardial infiltration with increased T2 values with heterogeneous enhancement on late Gadolinium imaging.
- Pathology:
  - Cardiac biopsy: Mediastinal diffuse large B cell lymphoma (DLBCL).
- PET scan:
  - Markedly hypermetabolic lymphoma involvement in the mediastinum and pericardium.
- Chemotherapy:
  - Dose-adjusted R-EPOCH with plans for six cycles of therapy.
- Follow up:
  - After three cycles of chemotherapy, a significant interval improvement in the metabolic activity.

Conclusion
This case demonstrates an atypical presentation of a rare disease masquerading as a commonly seen myocardial infarction. Despite multiple coronary artery disease risk factors, physicians must remain aware of alternative diagnoses in patients with atypical symptoms and presentation despite ischemic ECG changes and abnormal laboratories. It further emphasizes the importance of patient centered care and direct patient interactions and integration of past medical history, review of systems and exam to determine the best course of therapy. In addition, it illustrates the importance of multimodal cardiac imaging in early detection, rapid diagnosis, and safe treatment of myocardial infiltrates secondary to DLBCL. Furthermore, it confirms that standard therapy for DLBCL can be effective and safe with primary cardiac involvement and minimal adverse events.

References
4. Figure 1. Initial ECG on admission.
5. Figure 2. Cardiac MRI - Findings of multiple mass-like lesions that are hypertense on T2 black blood imaging (red arrow) suggesting edema with heterogeneous enhancement on late Gadolinium imaging (LGE).
6. Figure 3. F18 FDG PET Scan, before (above) showing extensive hypermetabolic nodular mediastinal lesions extending into the pericardium, and after (below) images approximately 6 months and 6 cycles of disease directed therapy showing significant interval improvement in the metabolic activity.
7. Figure 4. H&E: Photomicrograph shows sheets of large neoplastic lymphocytes.
8. Figure 5. CD20 immunostain for B-cell marker in malignant lymphomas.
9. Figure 6. CD30 immunostain for T-cell marker in malignant lymphomas.
13. Geisinger Medical Center, Danville, PA
**Learning Objectives**

- Identify the epidemiology of IgM multiple myeloma (MM) and Waldenstrom’s macroglobulinemia (WM).
- Recognize the clinical overlap in signs, symptoms, and bone marrow morphology of IgM MM and WM.
- Understand the importance of cytogenetics to distinguish IgM MM and WM in order to treat each disease process appropriately.

**Case Presentation**

84 female with remote history of stage IIc ovarian carcinoma and recent diagnosis of retinal hemorrhage

**Physical exam**

- Demonstrated tachycardia to 112 as well as pallor and mild gingival bleeding

**Initial Work Up**

- Kappa Lambda ratio: 537.1 (ref 0.26-1.65)
- Total protein: 77.1 g/L (ref 6.1-8.1)
- IgM: 3,200 mg/dL (ref 40-236)
- IgG: <140 mg/dL
- IgA: <51 mg/dL
- Serum viscosity: 4.7 relative to water (ref 1.5-1.9)

**Initial Treatment**

- Plasmapheresis + bendamustine 60mg/m2 for two days to treat presumed WM

**Bone Marrow Biopsy**

- Hypercellular, diffusely infiltrated by 38% plasma cells

**Cytogenetics**

- MAF-IgH t(14;16)+, MYD88- confirming the diagnosis of IgM MM

**Definitive Treatment**

- Bortezomib, Cyclophosphamide, and Dexamethasone

**Treatment**

- WM: Rituximab to target CD20 and chemotherapy (bendamustine alone vs bortezomib and dexamethasone)
- IgM MM: induction chemotherapy (bortezomib, lenalidomide or cyclophosphamide, and dexamethasone vs bortezomib and dexamethasone)

**Discussion**

- **Epidemiology**
  - WM accounts for <0.5% of all MM
  - IgM MM accounts for 5% of all MM

- **Clinical Features**
  - WM: Somatic mutation of MYD88 and 6q deletion
  - IgM MM: Ig translocations t(11;14), t(14;16), t(4;14)

- **Diagnosis**
  - WM: Rituximab to target CD20 and chemotherapy (bendamustine alone vs bortezomib and dexamethasone)
  - IgM MM: induction chemotherapy (bortezomib, lenalidomide or cyclophosphamide, and dexamethasone vs bortezomib and dexamethasone)

**Prognosis**

- WM: from five to ten year median survival
- IgM MM: from two to four year median survival

**Take Home Points**

- **IgM MM and WM are rare diseases which present with overlapping clinical symptoms and bone marrow biopsy findings**
- **Cytogenetics have become integral in the diagnosis of monogenic IgM gammopathies**
- Distinction between WM and IgM MM is critical as treatment and prognosis differ drastically

**References**

A rare case of severe thyrotoxicosis presenting as refractory torsades de pointes

Fayez Shamoon.MD Ahmad Damati.MD  Saint Michael’s Medical Center

Introduction

Acquired Torsades de Pointes is seen commonly in association with electrolyte disturbances and medication. Torsades is known to be associated with hypothyroidism, however it is very rarely seen with thyrotoxicosis. We are describing the first case in literature of Torsades de Pointes associated with thyrotoxicosis which was subsequently treated by achieving a euthyroid status.

Case Report

A 53 years old female with unknown past medical history was admitted through the Emergency Department with 1-week history of increased shortness of breath associated with palpitations, orthopnea, paroxysmal nocturnal dyspnea, and bilateral lower limb edema. On review of systems, the patient claimed to have a prolonged history of nausea, occasional vomiting, diarrhea, and non-intentional weight loss. Physical examination was remarkable for an irregular-irregular pulse of 170, a palpable thyroid, bibasilar crackles, and bilateral lower limb pitting edema. Her physical examination was otherwise not significant. Upon further work-up, the patient was found to have an elevated FT4 and T3, very low TSH, elevated BNP and mild hypokalemia. EKG showed Atrial fibrillation with rapid ventricular rate. CXR showed pulmonary vascular congestion. Neck ultrasound showed multiple thyroid nodules. Echocardiogram showed an EF of 25% with global hypokinesis. The patient was started on antihypertensive medications.

Upon a wean off trial of the backup pacing, the patient had recurrent episodes of torsades, and thus the patient was kept on back up pacing. After achieving euthyroid status with a TSH of 0.25, no further episodes were noted, and the patient was asymptomatic upon outpatient follow up.

Discussion

Torsades de pointes is a form of polymorphic ventricular tachycardia that is characterized by rotation of QRS complex above and below the baseline due to initiation of premature ventricular contraction in a patient with prolonged ventricular repolarization. Out of 300,000 sudden cardiac death in the US, around 5% were attributed to torsades. Pathophysiology of torsades is related to prolongation of QT interval. In acquired forms, it is typically caused by long-short RR intervals. Etiologies of Torsades can be classified mainly into congenital and acquired. Acquired causes are mainly related to drugs including antiarrhythmics, antipsychotics and antibiotics. Other causes are electrolyte abnormalities, mainly hypomagnesemia, hypokalemia. Rarely, torsades may occur in the setting of hypocalcemia as was noted in a case report secondary to thyroidectomy after thyrotoxicosis. Hypothyroidism also is a known precipitant to torsades and may even present as bradycardia.

Thyroid disorders have been linked to cardiovascular diseases. The main conduction abnormalities linked to hyperthyroidism include sinus tachycardia and atrial fibrillation. Suggested mechanisms include excess of beta receptor stimulation mimicking excess catecholamines state . Additional explanation might include direct inflammation of the conducting system. Upon literature review, several case reports of monomorphic ventricular tachycardia was associated with thyrotoxicosis due to underlying electrolyte disturbances. Other few cases seen in literature in which thyrotoxicosis progressed into polymorphic ventricular tachycardia include one associated with stress cardiomyopathy.

Summary

Torsades de pointes defined as polymorphic ventricular tachycardia with underlying QT prolongation is a very rare manifestation of thyrotoxicosis. Upon review of literature thyrotoxicosis was associated with polymorphic ventricular tachycardia with normal underlying QT interval. Euthyroid status is considered the treatment modality of choice of this condition, once achieved no further intervention is required.

References

What are the ODS? A Case of Osmotic Demyelination Syndrome Associated with Hemodialysis in End-Stage Renal Disease

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¹Rowan University School of Osteopathic Medicine, Department of Medicine, Stratford, New Jersey; ²Jefferson Health of New Jersey, Department of Medicine, Washington Township, New Jersey

Introduction

- Osmotic demyelination syndrome (ODS) is the irreversible demyelination of the central pons, among other areas of the brain, that is most often associated with rapid correction of hyponatremia.
- Divergently, reversible ODS is a rare state that can be seen in patients with end-stage renal disease (ESRD) on hemodialysis (HD).
- This clinical case offers an alternative problem representation for acute altered mental status in a patient with ESRD on HD.

Case Presentation

- A 76-year-old African American female presented to the ED with new-onset aphasia and confusion.
- Past medical history: ESRD on HD, diabetes mellitus, hypertension, hyperlipidemia.
- Home medications: glipizide, insulin, amlodipine, metoprolol, and simvastatin.
- Vitals: 195/86; all other vital signs stable.
- At admission, the patient exhibited global aphasia and apraxia.
- GCS=9 and NIHSS=14.
- Aspirin 325mg was administered and treatment was started for suspected cerebral vascular accident (CVA).
- Further workup revealed no signs of infectious or autoimmune etiology.
- Supportive treatment was given without antibiotics/steroids.
- Blood pressure was kept normotensive.
- Electrolytes were kept within normal limits.
- Fluid shifts were minimized during HD.
- The patient recovered to her neurologic and cognitive baseline by discharge six days later.
- Aspirin was discontinued.
- Follow up MRI brain was scheduled in three months.

Results

| Sodium remained 135-141 throughout her hospital stay |
| CT head, CT angiogram, and CT perfusion did not show acute intracranial ischemia or hemorrhage |
| Recent outpatient labs were within normal limits |
| EEG was negative for seizure |
| Urine drug screen was not performed due to anuria |
| Repeat MRI and MRA brain/head/neck was negative for CVA or reversible posterior leukoencephalopathy syndrome, but continued to show osmotic demyelination in the pons |

Neurological Imaging

Figure 1. Left (A): MRI brain axial view showed diffuse increased T2 signal intensity within the pons, suggestive of demyelination; Right (B): MRI brain axial view shows multiple areas of T2 prolongation scattered throughout the periventricular and subcortical white matter of both cerebral hemispheres.

Discussion

- ODS, more recently called central pontine myelinolysis, is most often caused by rapid correction of hyponatremia >10-12 mEq in 24 hours, but case reports have also shown ODS in patients undergoing dialysis1,2; these case reports correlate with our patient with global aphasia and apraxia.
- The mechanism of action of ODS associated with HD is not well understood.
- Treatment of this type of ODS consists of minimizing fluid shifts during HD and maintaining normotension.
- The patient had three HD sessions in her hospital stay, two of which were filtration without fluid exchange.
- Extensive workup was negative for other etiologies, and symptoms resolved without other intervention.

Conclusion

- Although rare, HD-associated ODS should be considered in the problem representation of altered mental status in patients with ESRD in the right clinical context.

References

“Nowadays, we have more sophisticated DDX generators that include epidemiological data, clinical and laboratory findings to generate a DDX list. In a study, the pooled accurate diagnosis retrieval rate for DDX tools was as high as 0.84”
Dame Idossa, M.D. 1, Melissa Lyle, M.D. 2, Joseph Grande, M.D., Ph.D. 3
1 Department of Internal Medicine, 2 Department of Cardiology, 3 Department of Laboratory Medicine and Pathology
Mayo Clinic Rochester, MN

**Background**

- Pericardial effusion is seen in more than 50% of patients with systemic lupus erythematosus (SLE).
- Myopericarditis, pericardial effusion, and heart failure, as the initial presentation of SLE is rare.
- Cardiovascular disease in SLE has a high morbidity and mortality, thus early detection and treatment are paramount.

**Case Presentation**

- 75-year-old woman presented with progressive dyspnea, orthopnea, lower extremity edema, pleuritic chest pain, and generalized fatigue.
- Laboratory workup was notable for Na 120, lactate 6, BNP 4138, and elevated liver enzymes.
- Electrocardiogram was notable for low voltage and mild diffuse ST elevations.
- Troponins were elevated, without a significant delta.
- Chest X-ray - large bilateral effusions.
- To work up hyponatremia, UA obtained. microscopic hematuria, WBCs, and an elevated albumin/cr ratio, concerning for a glomerular disease process.
- Rheumatologic work up - ESR 57, CRP 78.9, decreased C3 and C4, positive ANA, markedly elevated dsDNA >1000, and antibodies toward SSA/Ro, SSB/La, Smith, and RNP.

**Discussion**

- SLE in the elderly is uncommon, rarely reported with disease onset > age 65.
- Large pericardial effusions and myopericarditis as initial presentation of SLE is uncommon.
- When present, it is often associated with nephritis.
- It is important to recognize and treat early with immunosuppressive agents, given high mortality.

**Conclusion**

- She underwent pericardiocentesis and was initiated on prednisone and Cellcept.
- She had significant improvement in her symptoms inflammatory markers, auto antibodies, and microscopic hematuria.

**References**

A Case of a Falsely Positive Fourth Generation HIV Test: What Else Should We Consider?

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Tracey L. Henry MD, MPH, FACP2 Stacie Schmidt MD2
1 Emory Internal Medicine Residency, 2Emory University School of Medicine

Introduction

• The 4th generation HIV screen is the standard of care in the diagnosis of HIV
• 99% sensitivity and specificity
• Case reports have demonstrated common causes of false positive tests

Case Presentation

History of Presenting Illness:
• 17 y/o female with no PMH presented with headache, fever and myalgias. On day of admission, she developed a rash on her face and cheeks.
• Her 4th generation HIV screen was positive
• She denied history of sexual activity, IV drug use and any other risk factors for HIV transmission

Pertinent Lab Results
• 4th generation HIV Screen: Positive
• Confirmatory HIV-1/HIV-2 Antibody Differentiation Immunoassay and NAT 36hrs later: Negative
• Rheumatologic panel: + ANA, +dsDNA, + Smith, +RNP, Low C3, Low C4, +Anti-Histone antibody

Clinical Course
• She was diagnosed with systemic lupus erythematosus (SLE) and symptoms improved with prednisone and hydroxychloroquine

Table 1. Causes of a False Positive 4th Generation HIV Screen

<table>
<thead>
<tr>
<th>Infectious</th>
<th>Non-Infectious</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-cell lymphotrophic virus (HTLV-1/2)</td>
<td>Current or multiple past pregnancies</td>
</tr>
<tr>
<td>Epstein-Barr virus</td>
<td>Collagen Vascular Diseases</td>
</tr>
<tr>
<td>Viral hepatitis</td>
<td>Lymphoma</td>
</tr>
<tr>
<td>Mycobacterium tuberculosis</td>
<td>Autoimmune hemolytic anemia</td>
</tr>
<tr>
<td>Rickettsia spp.</td>
<td>Schistosomiasis</td>
</tr>
<tr>
<td>Toxoplasmosis</td>
<td></td>
</tr>
<tr>
<td>Schistosomiasis</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions

• Many conditions mimic acute HIV and cause a false positive 4th generation HIV screen
• Alternative diagnoses should be considered simultaneously while awaiting confirmatory HIV testing

References

5. Taylor, Susan C, MD; Gathers, Raechele Cochran, MD; Callender, Valerie D, MD; Rodrigues, David A, MD; Badreshia-Bansal, Sunita, MD. (2011) Treatments for Skin of Color. Elsevier
A rare but emergent cause of candidemia with a high resistance antifungal profile

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1Division of Infectious Diseases, University of Puerto Rico School of Medicine, 2Department of Medicine, University of Puerto Rico School of Medicine

INTRODUCTION

Candida duobushaemulonii is a rare but emerging fungal pathogen. It is part of the Candida hameulonii complex and related to the highly pathogenic Candida auris. Their multiresistant antifungal profile is a concern, limiting the selection of effective therapy. In this case we report a case of a candidemia with this specie in a critically ill patient, its resistance profile and the patient's outcome.

CASE DESCRIPTION

A 71-year-old male was admitted to the intensive care unit with a large bowel perforation and sepsis after an elective colonoscopy for which he was started on ciprofloxacin and metronidazole. The patient was taken into surgery for diverting colostomy and a bogota bag was placed. After the surgery he remained in mechanical ventilation. On day #8 of hospitalization, the patient develops fever, tachycardia, and low blood pressure.

PHYSICAL EXAMINATION

Vital sign: BP: 90/48, HR: 128 bpm, Temp: 38.8ºC
Lines: Right femoral venous central line, indwelling Foley Catheter
Chest: Clear to auscultation at apex and base bilaterally, Regular Rhythm, no murmur heard.
Abdomen: Non-distended, Bogota bag in place and no erythema on surgical site, BS+, soft and depressible.
Skin: No rash

LABORATORIES/IMAGING

CBC: showed leukocytosis with bandemia
U/A: absence of pyuria or bacteria
Chest film had no infiltrate
Blood cultures were drawn, and he was switched to vancomycin and meropenem
Three days later, yeasts were reported in blood cultures and he was started on caspofungin (50 mg daily)

Three days later, yeasts were reported in blood cultures and he was started on caspofungin (50 mg daily).

After six days of cultured blood a Candida duobushaemulonii was identified via VITEK2(8.01), showing resistance to all azoles, to most echinocandins and to amphotericin B as identified by Sensititre-YeastOne.

The specie was only susceptible to flucytosine (an oral therapy that cannot be given as monotherapy) and to micafungin (which was not available). Therefore, he was started on high doses of caspofungin (150 mg daily) and flucytosine, while the central line was removed.

Because Candida auris can be misidentified as Candida duobushaemulonii by commercial methods a sample of the specimen was sent to CDC in Atlanta for identification. The specimen was also identified as Candida duobushaemulonii via MALDI-TOF method (Bruker Biotyper with MicrobeNet and Bruker Daltonics databases). This information was not available for the management of the patient.

Further blood cultures were negative after three days of therapy. Once micafungin was obtained the therapy was modified and he completed a total of eleven days of initial combination therapy and five additional days of micafungin. He tolerated the therapy well and was successfully extubated. He survived 30-day post-fungemia.

We need to be aware of the resistance profile of Candida duobushaemulonii: an emerging pathogen in the healthcare system. In addition, candidemia as the cause of sudden deterioration in a critically ill patient and in patients requiring the use of central line catheters need to be always considered.

REFERENCES

When The Bottom Falls Out: Acquired Hemophagocytic Lymphohistiocytosis in the setting of Congenital Panhypopituitarism

Ryan P. Collier, MD; Joshua Tunnage, MD; Ian Ward, MD; Matthew Wright, MD

Keesler Medical Center Internal Medicine, WRNMMC Internal Medicine, Landstuhl Regional Medical Center Rheumatology, Landstuhl Regional Medical Center Hematology Oncology

Introduction

- Acquired Hemophagocytic Lymphohistiocytosis (aHLH) is a rare autoimmune condition associated with significant mortality despite aggressive clinical intervention.
- aHLH is characterized by a cytokine storm consisting of IFN gamma, IL-1, IL-6, and other inflammatory mediators leading to dysregulated activation and proliferation of T-cells and macrophages, and ultimately hemophagocytosis.
- aHLH can present similarly to sepsis, meningitis, or hepatitis and can quickly progress to multiorgan failure.
- In a patient who presented with suspected sepsis secondary to community acquired pneumonia who becomes critically ill, when would you change your treatment plan and begin treatment with aggressive immunosuppressive therapy?

Case Description

A 57F with history of panhypopituitarism and cutaneous vasculitis was admitted for suspected sepsis secondary to community acquired pneumonia.

Previously treated with dapsone and colchicine for cutaneous vasculitis, and had been on treatment leading up to hospitalization.

Initial patient improvement with subsequent clinical decline to acute renal failure with anuria and the development of two distinct lineages.

Due to clinical concern for aHLH, a H-Score was calculated at 210, indicating a 93% probability of having the disease. High dose intravenous methylprednisolone was initiated.

Bone marrow biopsy was deferred due to patient's clinical instability. Her acidemia worsened leading to cardiac arrest and patient demise. Post mortem, the patient's soluble IL-2 receptor resulted significantly elevated at 32,768 U/mL, which can be used as a surrogate marker essentially confirming aHLH.

Conclusions

- Acquired HLH is a clinical syndrome, with high mortality, that can masquerade as more common diseases such as lupus, sepsis, and lymphoma.
- Acquired HLH is associated with infections, malignancies, or autoimmune diseases in the setting of underlying immunosuppression.
- Previous classification systems were unable to be utilized in an efficient manner due to utilization of specific tests of cellular activity and provided little immediate utility to make a clinical decision.
- The H-Score provides a predictive score that can be generated with common labs thus avoiding specialty labs with increased turn around times.
- Our patient presented clinically stable, but due to previously known vasculitis and adrenal insufficiency, her disease course was complicated and potentially lead to delays in identification of a catastrophic disease process.
- Despite aHLH being a rare disease, it should remain on the differential when facing a critically ill patient presenting with, or developing, cytopenias and multisystem disease. If the initial treatment does not lead to clinical improvement in a patient presenting this way, a broad differential and clinical re-evaluation is needed to identify this disease.

References

Introduction

- Foreign body ingestion is a mainstay of medicine, but many times imagining may be deceiving and can lead to unnecessary interventions.
- This case demonstrates the importance of performing a thorough physical exam prior to subjecting patients to any subsequent tests or interventions in suspected foreign body ingestions.

Case Presentation

- A 36-year-old male with past medical history of multiple foreign body ingestions and Impulse and Conduct Disorder presents with abdominal pain concerning for repeat ingestion of sharp foreign objects.
- Two days prior to admission, he admitted to swallowing a screw. Initial chest X-ray at an outside facility, showed a single screw in his esophagus.
- Patient was transferred to our facility and began to experience hematemesis with bright red blood, chest pain, odynophagia, and generalized non-radiating abdominal pain.
- Repeat imagining on admission revealed 2 retained screws, one located in the esophagus and another in lower gastrointestinal tract.
- GI Consulted with planned EGD for object removal with 2 view X-ray request prior to procedure.
- Lateral view imaging demonstrated that the swallowed screw was indeed on the surface of the patient’s chest, and was found taped to the patient’s chest on the x-ray table.
- Prior to imagining, physical exam was noted to be unremarkable.
- Continued imaging showed that there were still previously ingested screws in the small bowel.
- Patient was started on pantoprazole 40 mg IV BID, and serial imaging was ordered to assess eventual progression of the objects through the GI system.

Radiology

- Image 1. Initial PA view chest x-ray showing screw in the esophagus.
- Image 2. Repeat abdominal x-ray showing screw in the esophagus and additional lower GI tract screw.
- Image 3. PA view of repeat chest x-ray prior to planned EGD.
- Image 4. Lateral view of repeat chest x-ray prior to planned EGD.

Conclusion

- Inadequate and incomplete physical exams are often overlooked causes of medical errors and are not reported frequently in literature.
- These errors can lead to unnecessary testing and interventions, a potentially harmful hospital course, and delays in diagnosis or treatment.
- This result is preventable with further emphasis on thorough physical exams.
- A cross-sectional study looking at medical errors reported that 63% of errors were due to a failure to perform a physical exam, 14% of reported errors were due to a misinterpretation of the correct physical exam maneuver, and 11% showed a complete miss or failure to look for correct signs [1].
- These errors all led to diagnostic and treatment delays/misses, unnecessary healthcare costs, and many times preventable exposure to radiation or contrast [1].
- In respect to our patient, a thorough exam prior to the chest X-ray would have revealed that one of the foreign body was simply taped to the abdomen rather than inside the patient’s distal esophagus, sparing the patient additional X-rays.
- This case portrays a unique example of preventable error in medicine, that may have led to an unnecessary EGD on a patient.
- We would also like to remind all physicians of the importance of complete and correct physical exam maneuvers when assessing a patient prior to imaging and planned interventions.

References

Antisynthetase syndrome is a rare autoimmune disease characterized by arthritis, myositis, and interstitial lung disease (ILD), though this classic triad only occurs in 20% of patients. The serologic hallmark is the presence of myositis specific antibodies (MSA), of which anti-Jo 1 is the most common. These are considered mutually exclusive and appear to predict distinct clinical phenotypes.

Anti-Ro52, the most common myositis associated antibody (MAA), has been associated with increased rate of ILD in connective tissue disease. Recent literature indicates that co-positivity of anti-Jo1 with anti-Ro52 confers an increased incidence of myositis, arthritis, symptomatic ILD, and malignancy.

There is a paucity of literature describing the phenotypic expression, disease course, and response to treatment with co-positivity of anti-PL12 and anti-Ro52.

**Symptom Prevalence by Antibody**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Jo-1</th>
<th>PL-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolated Rash</td>
<td>2%</td>
<td>11%</td>
</tr>
<tr>
<td>Isolated Myositis</td>
<td>14%</td>
<td>0%</td>
</tr>
<tr>
<td>Isolated ILD</td>
<td>29%</td>
<td>56%</td>
</tr>
<tr>
<td>Rash &amp; Myositis</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td>Rash &amp; ILD</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>Rash, Myositis, &amp; ILD</td>
<td>7%</td>
<td>0%</td>
</tr>
</tbody>
</table>

**Discussion**

- **MSAs** are specific for dermatomyositis (DM) and polymyositis (PM) and include Jo1, PL7, PL12, EJ, OJ, Mi2, and SRP.
- **MAAs** are found in myositis and other systemic autoimmune diseases and include PM-Sc, Ku, U1-RNP, and Ro52.
- Anti-Ro52 is the most prevalent MAA in antisynthetase syndrome and portends an increased risk of myositis, arthritis, severe ILD, and malignancy when co-occurring with anti-Jo1.
- Anti-PL12 is a rare antisynthetase antibody generally associated with lower rates of myositis; creatine kinase levels are often within normal limits. Approximately ¾ of cases achieve remission on monotherapy with glucocorticoids.
- The phenotypic expression and disease course of anti-PL12 is not well described, though our case suggests it may present with more aggressive myositis and interstitial lung disease and poor response to glucocorticoid monotherapy.

**Conclusion**

- Antibody testing can be utilized to predict clinical phenotype and potential response to treatment.
- While the phenotype of anti-PL12 and anti-Ro52 co-positivity has not been established, this case suggests that it may be associated with more aggressive myositis, increased severity of ILD, and a poorer response to glucocorticoid monotherapy than those with anti-PL12 alone.

**References**

Levofloxacin is a widely used antibiotic with a relatively safe side effect profile in clinical practice. There are previous reports of skin hypersensitivity reactions described before. These reactions are largely characterized by pruritus, rash, or photosensitivity.

We described a case of an elderly gentleman who developed small vessel vasculitis with cutaneous involvement after a seven day course of levofloxacin.

A 80yo gentleman with no previous history of other dermatologic conditions, allergies or adverse drug reactions who presented with new onset acute palpable rash with arthralgias that started less than 24 hours ago while on treatment with oral levofloxacin for a recent upper respiratory tract infection.

The rash began on the medial part of his feet and quickly ascended up until his buttocks, lower back and lower abdomen. He described this rash as red papules with a patchy distribution. He also presented with associated bilateral wrist arthralgias and bilateral shoulder pain which improved since admission.

We denied pruritus, crusting, prodromal fevers, recent travel history, insect bites or having similar rashes in the past or new medication use, except for levofloxacin. He denied any other new medications and denies any previous herbal preparations use. Home medications included: Allopurinol, Aspirin, Atorvastatin, Clopidogrel, Furosemide, Gabapentin, Isosorbide, Losartan, Spironolactone, Tamsulosin and Tramadol.

His skin examination showed multiple small palpable, non-blanching, non-tender purpuric lesions of various sizes, mostly seen from his feet up to his lower abdominal and back area.

Complementary testing revealed a CRP of 72.800mg/ml, his ANA screen was positive with a titer of 1:160 and homogeneous pattern. His C3 was of 84L. His other immunologic markers including complement C4, Cryoglobulins, Rheumatoid factor screen, C-ANCA and P-ANC were negative. His white blood count, Hgb, renal function panel and liver chemistries were unremarkable.

Organ involvement was ruled out based on acute symptoms. Viral infections including hepatitis B, C and HIV were ruled out. Chest CT did not show any abnormalities. His urine analysis was negative for protein, blood and white cells in the urine. Endoscopic evaluation was not performed in the absence of GI complaints. Histopathology of the skin showed perivascular mixed inflammatory cells. Workup raised a suspicion of the lower extremities at onset. Associated symptoms include fevers, arthralgias and generalized lymphadenopathy.

Most common lab markers include elevated inflammatory markers, specially ESR. The underlying etiology of LCV remains unknown. It is thought to be related to a type III hypersensitivity reaction with deposition of immune complexes and consequent damage to blood vessels by neutrophils. There are many case reports of multiple organ involvement, most commonly affecting the small vessels of the respiratory, GI tract and kidneys.

Diagnosis remain clinical based on the determination of the skin involvement and the time frame after starting an offending agent. Skin biopsy is recommended when there is a suspicion of other diseases or when symptoms are persistent or worsening.

The main treatment is to stop the offending agent which usually leads to resolution of the signs and symptoms within days to weeks without the need of additional treatment. Patients with joint symptoms may require NSAID therapy. Patients with a chronic or systemic disease may benefit from prednisone therapy. However, there are no head to head trials to determine the effectiveness of steroids as an initial treatment. There are reports of immunosuppressive agents being not helpful. Most patients with this condition have a benevolent course following drug withdrawal, which should usually allow physicians to avoid overtreating these patients.

CONCLUSION

1. It is very important to remark that the diagnosis is particularly diagnosed clinically based on high clinical suspicion, especially since there are previous reports of organ involvement that can present with worse outcomes.

2. It is also important for clinicians to be alerted to this diagnosis if suspected as a drug reaction and proceed with an immediate cessation of the offending agent.

REFERENCES


A Rare Colon Tumor

Mohamed Eisa, M.D., Birju Shah, D.O., Hope Hasting, M.D., Dan X. Cai, M.D., Dalbir S Sandhu, M.D.

Case Western Reserve University, MetroHealth Medical Center

Introduction:

Granular cell tumors (GCTs), also known as Abrikossoff tumors, are soft-tissue neoplasms with probable origin from Schwann cells that are very rarely found in colon. Here we report case of a colon GCT found on screening colonoscopy. In addition, the current available literature on this rare tumor is also reviewed.

Case:

A 51-year-old female was found to have a 4-mm polyp in the ascending colon on screening colonoscopy (Figure 1). There was no evidence of synchronous lesions. The polyp was removed en-bloc using cold snare resection without any complications. Histological evaluation revealed granular eosinophilic cytoplasm with nuclei that were small and uniform in appearance consistent with a GCT (Figure 2). On immunohistochemistry, Inhibin A and S100 were strongly and diffusely positive in the neoplastic cells confirming the Schwannian origin of the lesion. Due to the small size and essentially benign nature on histopathology, we plan to repeat colonoscopy in 3 years.

Discussion:

GCTs are rarely found in the intestinal tract with esophagus being the commonest site followed by the colon, stomach, small intestine, and anal canal. Most cases are found incidentally. They present commonly as small, sessile, round, submucosal nodules covered by normal mucosa. Commonly solitary lesions, up to 10 percent can present as two or more lesions at diagnosis. The diagnosis is usually made by histopathology. Neoplastic cells are plump, histiocyte-like, and bland-appearing with abundant granular eosinophilic cytoplasm containing acidophilic, periodic acid-Schiff (PAS) positive, diastase-resistant granules with small, uniform nuclei, in which mitotic figures are absent and uniform expression of neural markers, including S100 protein or neuron-specific enolase is noted. Advanced techniques have made endoscopic removal of these lesions a viable treatment option. Given the reported recurrence of GCTs, follow up is mandatory to identify recurrence and to assess the effectiveness and oncologic safety of endoscopic resection. Factors that predict higher malignant potential of GCTs are size (especially if it is more than 4 cm), presence of symptoms, depth of invasion, and site of primary tumor. For this reason inability to completely remove the lesion endoscopically or persistent positive margins mandate segmental resection. Continued reporting of such cases can help reach a management consensus and improve our understanding of this rare disease entity.
Leptospirosis is one of the most prevalent zoonotic diseases worldwide, caused by the spirochete, Leptospira. Despite its wide spread distribution, Leptospirosis is still underreported, especially in the USA. Most of the cases have rodents, rats or dogs as intermediate carrier.

**CASE DESCRIPTION**

- 47 - year - old male presented with complaints of high grade fever, abdominal pain, diarrhea and lower abdominal petechial rash for two days.
- He recently came back from a camping trip to a local Illinois park.
- He denied any recent tick, mosquito or flea bites.
- PMH: Hyperlipidemia
- Social history: Chronic smoker 2PPD x 20 years, chronic alcoholic (6 cans of beer/week).

**HOSPITAL COURSE**

- Physical examination
  - **VITAL SIGNS**
    - BP: 90/60
    - HR: 120
    - TEMP: 102F
  - **INITIAL LABS AND IMAGING**
    - Tbil: 4.5mg/dL, AST: 48U/L, ALT: 119U/L, ALKP: 278U/L
    - Initial CT abdomen & CXR: Unremarkable
    - Initial blood cultures: Negative
  - Broad spectrum antibiotics for severe sepsis
  - Septic shock
  - Acute respiratory distress syndrome
  - Hobby of hunting rodents
  - Skinned a ground hog 2 weeks ago

**DISCUSSION**

After an extensive literature review, we conclude that ours is the case of Leptospirosis contracted from a ground hog. Leptospirosis is a clinical diagnosis. It takes 7-10 days for the antibodies to become detectable. Drug of choice is Doxycycline.

**TAKE HOME MESSAGE**

Detailed history, a high index of suspicion and early initiation of appropriate antibiotics is highly imperative to prevent the progression of mild Leptospirosis to severe disease (Weil’s).
Urinoma with Unilateral Urinothorax: A Very Rare Cause of Abdominal Pain and Pleural Effusion

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Introduction
Urinoma is the result of retroperitoneal leakage of urine from a disruption of the urinary tract. Urinomas can be obstructive or traumatic. The most commonly accepted mechanism is the backflow of urine with increased intra-pelvic pressures and subsequent forniceal rupture. On the contrary, it is believed to have a renoprotective effect in the long-term. We present an extremely rare case of abdominal pain and pleural effusion occurring from urinoma with a resultant unilateral urinothorax.

Case Discussion
The patient is a 76-year-old male who presented with generalized weakness, anorexia, abdominal pain and anuria for 2-3 days.

Medical history : prostate cancer 20 years ago s/p radiotherapy.

On exam, he appeared frail and dehydrated.

Initial labs : revealed anemia and acute renal failure with a serum creatinine of 8.7 mg/dL and potassium of 8.6 mmol/L. He was started on hemodialysis.

Work up: complement levels, anti-neutrophil cytoplasmic antibody, anti-nuclear antibody, anti-myeloperoxidase antibody, and anti-proteinase 3 antibody, hepatitis panel was negative.

CT abdomen : right pleural effusion and a large 25 cm size retroperitoneal fluid collection posterior to the right kidney, suspicious for urinoma.

Thoracentesis: transudative effusion with a low pH. A pleural fluid creatinine to serum creatinine ratio was 1.07, which is consistent with the diagnosis of urinothorax.

Elevated retroperitoneal fluid creatinine of 36.6 mg/dL to serum creatinine of 5.1 mg/dL was suggestive of urinoma.

A renal nuclear scan with MAG-3 : a leak of the radiotracer through the right kidney and into the retroperitoneal fluid drainage bag, confirming this complicated diagnosis of urinoma.

Management:

The patient underwent retroperitoneal fluid drainage and nephroureterostomy tube placement.

His serum creatinine trended down to 1.0 mg/dL with relief of urinary obstruction.

Our patient is currently off of hemodialysis.

He underwent cystoscopy at a later date showing a high-grade transitional cell carcinoma of the bladder.

Conclusion
Urinomas can be asymptomatic or present with non-specific symptoms such as abdominal pain, malaise, and oliguria.

- A high index of clinical suspicion is important for early diagnosis and optimal management.
- Urinothorax should be suspected in the presence of unexplained pleural effusion and obstructive uropathy.
- CT abdomen with contrast is the best modality for diagnosis.
- Large and obstructive urinomas require drainage through a urological procedure.

References:

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It’s Just a Cold Sore: Acute Liver Failure Secondary to Disseminated Herpes Simplex Virus Due to Ixekizumab

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Introduction
Despite continued improvement in diagnosis and treatment of acute liver failure (ALF), mortality rates remain as high as 40%. Acute liver failure is typically caused by hypotension, toxins or viral hepatitis. Viral hepatitis is typically caused by hepatitis virus A through E and rarely caused by viruses such as CMV, EBV and HSV. HSV 1 typically presents with oral ulcers, while HSV 2 presents as genital ulcers. Ixekizumab is an IL-17a antagonist typically used for ankylosing spondylitis with recent approval for psoriasis. HSV Hepatitis is a rare cause of ALF that carries a staggering high mortality rate due to poor recognition.

Case
47-year-old male presented with altered mental status, septic shock and significantly elevated transaminases. The patient had a history of psoriasis and had recently been tapered off ixekizumab due to GI upset and started on systemic prednisone. The patient had negative toxicology screen, negative blood, urine and cultures and unremarkable CSF studies. He was started on drug spectrum antibiotic and antifungal coverage, but the patient significantly declined requiring intubation, continuous renal replacement therapy, and multiple vasopressors. Although no active lesions were discovered, the patient was found to have positive serum HSV 1. Despite initiation of acyclovir and aggressive liver transplant evaluation, the patient continued to decline and care was withdrawn.

Diagnosis
Due to rarity, there are no societal guidelines screening for and diagnosing HSV hepatitis. Besides history and physical exam, laboratory testing such as antigen detection, viral culture, liver biopsy and nucleic acid PCR are critical for diagnosis. Despite wide availability of testing, almost 50% of HSV hepatitis cases are diagnosed on autopsy, while less than 10% are diagnosed by serological confirmation.

Treatment
The mainstay of treatment for HSV hepatitis is parental acyclovir. Duration of therapy is controversial with recommendations varying from resolution of symptoms to improvement in liver function tests to serum PCR becoming negative. Addition of other antivirals including foscarnet has been explored, but no definitive guidelines exist. Liver transplantation with pre- and post-transplantation acyclovir can be utilized if patients fail antiviral therapy.

Conclusions
• HSV Hepatitis is a rare cause of ALF with a mortality rate of as high as 80%
• Manifestations include hemodynamic instability, altered mental status, ascites, genital or oral lesions, and fluid overload.
• Diagnosis can be made with HSV PCR and antigen detection, but liver biopsy remains gold standard.
• The mainstay of treatment is parental acyclovir, but duration and addition of other antivirals remains controversial.
• Liver transplant with perioperative acyclovir is a final measure for patients failing antiviral therapy.
• The addition of HSV screening in the initial workup for ALF of unknown etiology should be considered.

References
Are You My Doctor?
Assess and Improve Patient Identification of Physicians and Their Roles by Distributing Information Cards

Yuan Yao, MD, Savannah Desmarais, DO, Frank Weigel, DO, Payal Parikh, MD, Victor Collier, MD, Nino Balanchivadze, MD

Introduction

- Multiple medical team members and trainees are involved in direct patient care in a teaching institution which can lead to confusion with regards to whom is ultimately responsible for patient care.
- This can result in an unclear delivery of the plan of care to patients and their families and impair their ability to make informed decisions.
- Prior studies have shown that most patients (75-87%) were unable to identify an inpatient physician in charge of their care. Studies suggest placement of cards listing names, photos, and roles of team members in patients' rooms significantly improved patients' ability to identify their in-hospital physicians in a teaching hospital. However, patient satisfaction was not evaluated in these studies.
- The purpose of this QI project is to distribute information cards to improve patient understanding of physician roles and ultimately improve communication and patient satisfaction in our institution.

Methods

Study Design:
- This quality improvement project included a pre-information card phase (October, 2017-December, 2018) and an information card phase (December, 2017- May, 2018).
- A feedback sheet was administrated in both pre-information card phase and information card phase to all eligible patients. (Figure 1). An information card was developed based on a prior study, which included each physician’s name and their roles in a teaching team. (Figure 2).
- The intervention was to distribute information cards to all patients on the internal medicine teaching team. Patient satisfaction information was collected as very satisfied, somewhat satisfied, neutral, and not satisfied.

Data collection:
- All feedbacks were collected by research assistants. The information cards were initially distributed by dayshift interns at their first encounter with a new patient to them. Due to small amount patients claimed they received an information card, we changed to distribute information cards by the attending physician on each teaching team. However, no significant improvement was observed regarding to response rate. We discontinued our project in 5/2018.

Inclusion and exclusion criteria:
- All adults on internal medicine teaching teams were eligible for this study. Patients were included if they have been admitted more than 48 hours and obtained verbal consents.
- The exclusion criteria were patients with dementia, delirium, altered mental status, or encephalopathy and no family members available to complete the feedback. We also excluded patients who claimed that they did not receive information card in the information card phase.

Statistical analysis:
- Descriptive statistic was used to summarize subject characteristics including median for continuous variables, and number (n) and percentage (%) for categorical variables. We used Wilcoxon rank-sum test for continuous variables in univariate comparison and Chi-square tests or fisher's exact for categorical variables. A statistical significance was defined as p < 0.05. Analysis was performed by R 3.5.1 GUI 1.70 El Capitan build (7543).

Results

- A total of 106 patients completed the feedback, with 60 in pre-information card phase and 46 in information card phase.
- Fewer patients in the information card phase were able to recognize at least one physician’s name involving in their care (61.7% vs. 47.8%, p=0.01).
- 69.6% patients in the information card phase were very satisfied with daily events or plans, compared to 53.3% in pre-information card phase (p=0.04).
- Significantly more patients in the information card phase stated they received more consistent information (78.3% vs. 95.6%, p=0.01).
- More patients in information card phase were able to understand the roles of their physicians (38.3% vs. 43.5%, p=0.1), but it was not statistically significant.

Conclusions

- Distributing information cards does not improve patient identification of physicians and their roles. However, improved patient satisfaction and physician-patient communication were observed. Alternative economic intervention tools should be considered in the future.

References

**INTRODUCTION**

- *Lactobacillus* species (sp) constitute a significant component of the microbiota of digestive, urinary and genital systems [1].
- *Lactobacillus* sp. are rarely pathogenic but have been occasionally reported to cause serious infections in immunosuppressed patients [6,8] such as endocarditis, pyelonephritis, meningitis, chorioamnionitis, endometritis, liver and splenic abscesses and bacteremia [1,6,7].
- We describe here the first case of persistent *L. jensenii* bacteremia associated with a large prostatic abscess and septic pulmonary emboli.

**CASE REPORT**

- 57 year old male with history of hypertension presented with 4 weeks history of progressive malaise, subjective fever and night sweats associated with urinary frequency and nocturia.

- **Physical exam:**
  - T 102.5°F, HR 140 beats/minute, BP 136/90 mmHg, RR 14 on room air.
  - Rest of the physical exam: unremarkable.

- **Laboratory findings:**
  - WBC 12700/µL, glucose 652 mg/dL, anion gap 21, HbA1c > 14, CRP 15.
  - Urinalysis: WBC 184, RBC 24, 3+ leucocyte esterase and massive bacteriuria.

- **Microbiological findings:**
  - Blood cultures: On Day 1 grew *Lactobacillus* sp. in 1/4 bottles. On Day 4: 4/4 bottles were positive.
  - Urine culture showed normal urogenital flora which was later speciated as *Lactobacillus* sp.

- **Hospital Course:**
  - CT scan of chest, abdomen and pelvis showed multiple large abscesses within the seminal vesicles and prostate extending into the right obturator internus muscle with bilateral peripheral cavitary lung nodules consistent with septic emboli.

- **Hospital Course:**
  - CT guided drainage of the prostatic abscess was performed and cultures grew *Lactobacillus* sp identified as *L. jensenii* using a 16S-RNA PCR.
  - A transesophageal echocardiogram showed no valvular vegetation.
  - Patient was treated empirically with cefepime and vancomycin.
  - A repeat CT scan after 16 weeks of treatment showed interval resolution of previously described ring-enhancing collection within the prostate and seminal vesicles.

- **Hospital Course:**
  - Hospital Course: 4/4 bottles were positive.
  - Urine culture showed normal urogenital flora which was later speciated as *Lactobacillus* sp.

**CONCLUSION**

- We present a rare case of *L. jensenii*-related prostatic abscess with persistent bacteremia and secondary septic pulmonary emboli suggestive of right sided endocarditis.
- Although *Lactobacillus* sp. are considered an important commensal of the human microbiome, it can cause severe infections, mainly in immunosuppressed hosts [6,8].
- Antibiotic susceptibility varies widely for different species of *Lactobacillus* [4], thus further speciation of normal urogenital flora in urine culture can be helpful in early identification and appropriate therapy of serious infections.
- Invasive infection with *Lactobacillus* sp. should always be considered even in the presence of isolated bacteremia given its association with high mortality (26% to 44%) [3,5].
- Source identification and control is crucial to improve outcome.

**REFERENCES**

Factors Implicated in Thoughts of Suicide and Self-Harm Among Medical Students
Christine Thomas, DO; Blake Murphy, BA; William Adams, PhD; Brendan Martin, PhD; Tania Torres, MD; Laura Ozark, MD

Introduction
As the medical education community addresses depression and suicidal ideation among students, it is essential to understand factors that positively and negatively affect thoughts of self-harm.

The purpose of this study is to:
1) Describe the prevalence of depression and thoughts of self-harm
2) Identify risk factors for development of these thoughts
3) Identify lifestyle factors which may protect students

Methods
Following IRB approval, an anonymous survey was distributed to all medical students enrolled at Loyola University Stritch School of Medicine between July 2017 and June 2018. Basic demographic information included students’ history of depression or anxiety, responses to the Patient Health Questionnaire (PHQ-9), and questions on regular exercise habits, relationship status, spirituality, communication with family, and access to friends. Major depression was defined as a PHQ-9 score ≥ 10, and frequency of self-harm or suicidal ideation was rated on a five-point ordinal scale ranging from not at all (0) to nearly every day (4). Univariable ordinal logistic regression models were used to estimate the odds of more frequent suicidal ideation as a function of students’ demographics. For each model, the proportional odds assumption was assessed using a score statistic. Due to survey anonymity, it was not possible to measure paired survey responses; only the first survey response was used for these analyses.

Results
Seven-hundred responses were collected from four medical school class years and five survey administrations. Of these, 114 (16.3%) were consistent with major depression and anxiety, responses to the Patient Health Questionnaire (PHQ-9), and questions on thoughts. Among all 700 responses, 66 (9.4%) reported thoughts of self-harm. 46 of these 66 responses (69.7%) endorsed such thoughts several days of the week, 8 (12.1%) over half the days, and 12 (18.2%) nearly every day. Figure 2 details trends in thoughts of self-harm over the course of the study and Figure 3 demonstrates the frequency of these thoughts.

Results: Descriptive Analysis
Among all 700 responses, 66 (9.4%) reported thoughts of self-harm. 46 of these 66 responses (69.7%) endorsed such thoughts several days of the week, 8 (12.1%) over half the days, and 12 (18.2%) nearly every day. Figure 2 details trends in thoughts of self-harm over the course of the study and Figure 3 demonstrates the frequency of these thoughts.

Discussion
Our descriptive results align with both a prior reported prevalence of depression between 10-30% and suicidal ideation between 6-12% in medical students. Similar to prior studies, we found that a prior history of anxiety or depression was significantly associated with thoughts of self-harm among medical students. When assessing the impact of lifestyle factors, we identified that being partnered may be associated with decreased suicidality – a finding that deserves further examination in future research. A major limitation of this project is the assessment of suicidal ideation via the PHQ-9, to prior studies, we found that a prior history of anxiety or depression was significantly associated with thoughts of self-harm among medical students. Regardless, our project can serve as a springboard for further studies assessing the utility of lifestyle modifications on medical student depression and suicidality.

Table 1. Odds of higher suicidality score on the first survey administration

<table>
<thead>
<tr>
<th>Valid N</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Year (ref = M1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M2</td>
<td>2.842</td>
<td>0.649</td>
<td>12.443</td>
</tr>
<tr>
<td>M3</td>
<td>1.396</td>
<td>0.272</td>
<td>7.154</td>
</tr>
<tr>
<td>M4</td>
<td>2.223</td>
<td>0.505</td>
<td>9.788</td>
</tr>
<tr>
<td>Male vs Female</td>
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<td></td>
<td></td>
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<tr>
<td>Male</td>
<td>2.877</td>
<td>0.967</td>
<td>8.562</td>
</tr>
<tr>
<td>History of Depression or Anxiety</td>
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<td></td>
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<tr>
<td>No</td>
<td>4.457</td>
<td>1.578</td>
<td>12.586</td>
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<tr>
<td>Regular Exercise</td>
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<td></td>
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<tr>
<td>No</td>
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<td>0.161</td>
<td>1.250</td>
</tr>
<tr>
<td>Access to Family</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.325</td>
<td>0.087</td>
<td>1.219</td>
</tr>
<tr>
<td>Partnered</td>
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<td></td>
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<tr>
<td>No</td>
<td>0.330</td>
<td>0.111</td>
<td>0.983</td>
</tr>
<tr>
<td>Access to Friend(s)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.421</td>
<td>0.139</td>
<td>1.274</td>
</tr>
<tr>
<td>Spiritual</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.675</td>
<td>0.244</td>
<td>1.867</td>
</tr>
</tbody>
</table>

Extended Duration of Thromboprophylaxis for Medically Ill Patients: A Meta-analysis of Randomized Controlled Trials

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INTRODUCTION

Patients hospitalized for an acute medical illness are at increased risk of venous-thromboembolism (VTE). The benefit of extended duration thromboprophylaxis in these patients beyond hospital remains controversial. Therefore, we performed a meta-analysis of randomized controlled trial (RCTs) examining the efficacy and safety of extended-duration anticoagulation prophylaxis for VTE prevention in this high-risk population.

METHODS

An electronic database search was conducted to include all randomized controlled trials (RCTs) comparing between extended-duration versus short-duration thromboprophylaxis in medically ill patients with high risk of VTE. The primary efficacy outcome was the composite events of asymptomatic DVT, symptomatic VTE (including symptomatic proximal DVT and non-fatal pulmonary embolism), and death from VTE-related causes. The primary safety outcome was major bleeding defined as fatal bleeding, critical site bleeding, bleeding with a drop-in hemoglobin of ≥ 2 mg/dl or requiring transfusion of ≥ 2 units. Risk ratio (RRs) and 95% confidence intervals (CIs) were calculated using a random-effects model. Subgroup analysis and meta-regression analyses based on study level covariates were performed.

RESULTS

Five RCTs were included totaling 40,124 patients. Mean age 71 years and 50.5% were male. Extended-duration thromboprophylaxis ranged from 28 to 45 days post-discharge, and it was associated with a significant reduction in the primary efficacy outcome compared with standard-duration therapy (RR 0.75; 95% CI 0.67-0.85; P<0.01).

Additionally, there were significantly reduced rates of symptomatic VTE (RR 0.53; 95% CI 0.33-0.85; P<0.01) and asymptomatic DVT (RR 0.81; 95% CI 0.71-0.94; P<0.01). However, there were no significant differences between both groups in VTE-related death (RR 0.81; 95% CI 0.60-1.10; P=0.18) or all-cause death (RR 0.97; 95% CI 0.88-1.08; P=0.64). In contrast, extended-duration thromboprophylaxis was associated with increased risk of major bleeding (RR 2.04; 95% CI 1.42-2.91; P<0.01) as well as non-major clinically relevant bleeding (RR 1.81; 95% CI 1.29-2.53; P<0.01). In subgroup analysis, the primary efficacy outcome was significantly reduced in those aged > 75 year.

CONCLUSIONS

Among hospitalized medically ill patients, extended-duration thromboprophylaxis was associated with a decreased risk of composite events of the primary efficacy outcome and symptomatic VTE with no significant difference in all-cause death or VTE-related death. Furthermore, there was a significantly increased risk of major bleeding with extended-duration thromboprophylaxis. Benefits and risks should be weighed before initiating extended-duration thromboprophylaxis until further well-controlled RCTs identify patients with clear benefit and low risk of harm.
Kaposiform Hemangioendothelioma of the GI Tract: An exception to Occam’s principle

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Departments of Internal Medicine¹; Hematology/Oncology²; Pathology³, University of Miami Health System

Introduction

Kaposiform hemangioendothelioma (KHE) is a rare and locally aggressive vascular tumor with histological features resembling Kaposi sarcoma and capillary hemangiomata mainly occurring in children and adolescents.

Approximately 200 cases have been reported since its original description in 1993, with the vast majority presenting at an early age as raised ill-defined lesions with a red-blue hue mainly involving the skin and soft tissues in the extremities. Cases in adults remain extremely rare.

Case Description

A previously healthy 29 year-old obese man presented with progressive abdominal pain for 4 months, new-onset nausea/emesis and signs of obstipation found to be consistent with small bowel volvulus.

On admission he was tachycardic, febrile and had a distended abdomen that was diffusely tender to palpation with audible borborygmi. Imaging revealed adjacent fat stranding in the mesentery, multiple enlarged mesenteric lymph nodes, questionable pneumatosis intestinalis and free fluid in the pelvis.

The patient underwent exploratory laparotomy and resection of 55 cm of necrotic small bowel followed by enteroenterostomy and anastomosis. Copious volume of hemorrhagic fluid was present within the abdomen prior to evisceration of the small bowel. Microscopic examination revealed KHE involving small intestinal mesentery, muscularis propria and submucosa.

His recovery was uneventful and he was discharged after stabilization, opting to manage him expectantly with abdominopelvic imaging and to monitor for development of Kasabach-Merrit phenomenon.

Discussion

Kaposiform hemangioendothelioma (KHE) is a rarely observed vascular neoplasm with histological features resembling those of Kaposi sarcoma (spindle-shaped endothelial cells and slit-like vascular channels) and capillary hemangiomata mainly presenting in children and adolescents.

The entity was first described in 1993 when it was found to be associated with thrombocytopenia and consumption coagulopathy aka Kasabach-Merritt phenomenon [KMP]. Cases in adults remain extremely rare with 2 reports of lesions involving the testes and 2 cases involving the thoracic cavity or cage.

Immunohistochemically, the spindle cells are positive for vascular endothelial markers (CD31, CD34 and ERG) but not for GLUT1 (which is positive in the endothelial cells of infantile hemangioma). Smooth muscle actin (SMA) is focally positive within the tumor mass indicating the presence of pericytes. The slit-like lymphangiomatous areas exhibiting rich lymphatic vessel configuration show positive staining for D2-40 (podoplanin).

KHE is a locally aggressive neoplasm. Up to 70% of patients with KHE develop Kasabach-Merritt phenomenon, the risk of which seems to be highest with large lesions, congenital lesions and with tumors located in the mediastium and retroperitoneum. Approximately 10% of patients die as a consequence of disease, either due to local growth or KMP.

Conclusions

Awareness of unusual presentations of KHE such as in this case illustrates how timely surgical intervention and a proper histopathological diagnosis may prevent potentially catastrophic consequences, namely thrombocytopenia and severe bleeding diathesis.

References

2. Weiss S.W. Kaposiform Hemangioendothelioma. In Fletcher, Bridge, Hogendoorn, Mertens (Eds.): WHO Classification of Tumours of Soft Tissue and Bone. IARC: Lyon 2013; p 145-146.
Introduction

- Adult T-cell leukemia-lymphoma (ATL) is an extremely rare peripheral T-cell neoplasm that is associated with human T-lymphotropic virus type 1 (HTLV-1).
- ATL generally has a poor prognosis with shorter overall survival compared to other peripheral T-cell lymphomas.
- Severe hypercalcemia can be associated with ATL.

Case

A 66-year-old female presents with altered mental status. On presentation, she was tachycardic. Other vitals were stable.

Significant Labs:
- White blood cell count: 155 10^3/µ (94% lymphocytes)
- Hemoglobin: 8.3 g/dL
- Platelets: 111 10^3/µL
- Calcium: 17.4 mg/dL
- Parathyroid hormone level: 7.5 pg/mL

Hospital Course:
- Treated with IV fluids and pamidronate with improvement
- Parathyroid hormone level: 7.5 pg/mL
- Platelets: 111 10^3/µL
- Hemoglobin: 8.3 g/dL
- White blood cell count: 155 10^3/µL (94% lymphocytes)

Hospitalization complicated by acute hypoxemic pneumonia. She was diuresed and treated with IV Zosyn and Vancomycin with improvement in respiratory status.

Bone marrow biopsy showed t-cell lymphoproliferative disorder.
- CT C/A/P showed multiple enlarged lymph nodes in the pelvis, upper abdomen and retroperitoneum. Nuclear medicine bone scan and CT head revealed lytic lesions in the calvarium.
- Bone marrow slides sent for pathology revealed mature T-cell neoplasm occupying 30% of the marrow space with leukemic phase.

Started on dexamethasone, cyclophosphamide, vincristine and prednisone.

Table 1. Clinical variants of ATL

<table>
<thead>
<tr>
<th>Clinical Type</th>
<th>Acute (&lt;50% of cases)</th>
<th>Lymphomatous (&lt;20% of cases)</th>
<th>Chronic (&lt;15% of cases)</th>
<th>Smoldering (&lt;5% of cases)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Signs</td>
<td>Fever, cough, lymphadenopathy, skin lesions, hepato-splenomegaly</td>
<td>Lymphadenopathy, hepato-splenomegaly</td>
<td>Minimal lymphadenopathy, mild constitutional symptoms</td>
<td>Skin lesions, minimal lymphadenopathy and splenomegaly</td>
</tr>
<tr>
<td>Labs/ Imaging</td>
<td>Marked leukocytosis (lymphocytosis), atypical peripheral malignant T-cells, hypercalcemia, elevated LDH, lytic bone lesions</td>
<td>No (&lt;1%) peripheral malignant T-cells, can have hypercalcemia</td>
<td>Stable moderate lymphocytosis, normal calcium</td>
<td>No lymphocytosis, rare hypercalcemia</td>
</tr>
<tr>
<td>Median Survival</td>
<td>6 months</td>
<td>10 months</td>
<td>2-5 years</td>
<td>3 years</td>
</tr>
</tbody>
</table>

Discussion

ATL: an aggressive post-thymic lymphoproliferative neoplasm of T-cells associated with HTLV-1
- Generally has a poor prognosis.
- Occurs in ~5% of patients with HTLV-1.
- HTLV-1 infection is typically endemic to Japan, the Caribbean, western Africa and southeastern U.S.
- Median survival time: ~13 months.
- ATL incidence in the U.S.: ~0.05 cases/100,000 people.
- 4 clinical variants: acute, lymphomatous, chronic, smoldering.

Diagnosis:
- Identification of at least 5% abnormal T-lymphocytes in the peripheral blood and confirmation of HTLV-1 infection.

Common Clinical Features:
- Circulating leukemia cells, lymphadenopathy, hepatosplenomegaly, lytic bone lesions and opportunistic infection, skin infections
- Severe hypercalcemia (serum calcium >14 mg/dL) can be seen in >80% of ATL.

Mechanisms of Hypercalcemia:
- Many factors have been implicated, including interleukin-1 (IL-1), transforming growth factor-ß (TGF-ß) and parathyroid-related protein (PThRP).
- PThRP is considered to play a significant role by stimulating osteoclasts and thus increasing bone resorption as ATL cells typically express large amounts of PThRP.
- Important to aggressively treat severe hypercalcemia as it has been associated with early mortality.

Treatment:
- Chemotherapy
- Allogeneic stem cell transplantation

References

Introduction

Isolated left ventricular noncompaction (LVNC) can be sporadic or familial and is characterized by prominent trabeculae and deep intertrabecular recesses. It has been found in 0.014 -1.3 percent of patients undergoing echocardiography, and it is an uncommon cause of heart failure and sudden cardiac death.

Case

A 59-year-old male with a history of COPD presented with dyspnea and leg swelling over 3-4 weeks. His baseline COPD-related exertional dyspnea progressed to symptoms at rest along with new orthopnea. He denied chest pain, palpitations, syncope, fever, chills, wheezing or productive cough. His mother and brother died at ages 54 and 44, respectively, after developing heart failure. The patient smokes 4-5 cigarettes a day, with a 40 pack-year history. Examination on admission revealed stable vitals, elevated JVP, normal S1 and S2, regular heart rate, diminished air entry in bilateral bases with occasional wheezing and bibasilar rales. His lower extremities revealed bilateral 1+, non-tender, pitting edema with clubbing.

The EKG showed sinus tachycardia, right axis deviation with evidence of left ventricular hypertrophy and right atrial enlargement. There were no ischemic changes. CXR was normal. An echocardiogram showed global hypokinesia with a left ventricular ejection fraction of 35%-40%, grade I diastolic dysfunction and probable left ventricular noncompaction. Right ventricular function and RV systolic pressure were normal. With CAD risk factors significant only for smoking, a provisional diagnosis of left ventricular non-compaction (LVNC) was made.

He was started on diuretics, lisinopril and carvedilol. A right heart catheterization revealed non-ischemic cardiomyopathy secondary to LVNC with a mildly elevated pulmonary wedge pressure. Cardiac MRI confirmed increased trabeculation in both ventricular apices with impaired biventricular systolic function, confirming non-compaction cardiomyopathy.

Discussion

LVNC is thought to be due to intrauterine arrest of compaction of the loose interwoven meshwork present in fetal myocardial primordium. Alternatively, the pronounced hypertrabeculation may be due to altered regulation in cell proliferation, differentiation, and maturation during ventricular wall formation. Clinically, it may have variable manifestations of heart failure, chest pain, thromboembolic events, and atrial and ventricular arrhythmias, including risk of sudden cardiac arrest (SCA). Our patient presented with new onset heart failure with decreased systolic dysfunction, but clean coronaries on cardiac catheterization.

The significant family history pointed us towards a cardiomyopathy workup. A diagnosis of non-ischemic cardiomyopathy due to LVNC posed our patient to the risk of arrhythmias, thromboembolism, and SCA. He was advised to undergo Holter monitoring following discharge to screen for arrhythmias, discuss role of implantable cardioverter-defibrillator and anticoagulation given his reduced ejection fraction, and genetic counseling. Further follow-up showed slight improvement in ejection fraction with continued therapy.

References

1. Left Ventricular Noncompaction A Distinct Cardiomyopathy or a Trait Shared by Different Cardiac Diseases? Eloisa Arbustini, MD,* Frank Weidemann, MD,y Jennifer L. Hall, PHDz
2. Left ventricular noncompaction cardiomyopathy. Kamal Shemisa, Jun Li, Julio A Barcena
Masquerading Melanomas

Matthew Lipinski, DO¹, Diane Hershock, MD, PhD¹
1. Penn State Health at Milton S. Hershey Medical Center

Introduction
Skin lesions are encountered very frequently by internists. Although classically we think of melanomas as irregular pigmented spots with other “ABCDEs,” they can present in many other ways, as illustrated by this case.

Case Presentation
A 22 year-old woman presented with several months of multiple progressively enlarging subcutaneous nodules. Over the past week she had also developed diplopia and nausea. These nodules had quadrupled in size over the past several months. She does not go outside often, and uses sunscreen when she does. Two siblings have had biopsy-proven lipomas in the past. There is no history of skin cancer in her family.

Small flesh-colored, freely mobile nodules with irregular borders were present on her right axilla, left arm, back, and chest wall [fig. 1]. There was a large 5 cm flesh-colored nodule on her right scalp [fig. 2]. There were two 1 cm blue-pigmented nodules in her left axilla. Skin biopsy of a left arm nodule revealed metastatic melanoma. MRI of her brain [fig. 3] and nodule biopsy [fig. 4] revealed metastatic melanoma.

Discussion
We classically picture melanoma as dark, irregularly-bordered nodule in a patient with a positive family history. However, only about 10% are familial, and many have multiple different colors, or are non-pigmented and resemble subcutaneous nodules. Nodular melanoma (the type this patient has), especially when skin-colored, usually has the worst prognosis, partly due to delay in recognition.

Metastatic melanoma still portends a horrible prognosis, despite advances with CTLA-4 and PD-1 receptor inhibitors. Due to its many possible presentations and high morbidity and mortality, internists and hospitalists need to have a high clinical suspicion for melanoma when presented with abnormal skin findings. Any skin lesion with concerning features (“ABCDEs”) warrants discussion about possible biopsy.

References

A 64-year-old female with a past medical history of major depression, bipolar disorder, hypertension, hyperlipidemia and chronic obstructive pulmonary disease presented to the emergency department after a fall that was preceded by rotational vertigo. She also had left upper extremity numbness and weakness. She denied loss of consciousness, difficulties with speech, and other areas of weakness. She had multiple similar episodes in the preceding two weeks. She endorsed a strong family history of stroke.

On arrival to the emergency department, her vertigo, weakness, and numbness resolved. Her vital signs were stable. She had a disconjugate gaze but an otherwise normal neurological exam.

Magnetic resonance imaging of the brain showed scattered small bilateral acute infarcts involving multiple vascular territories without significant mass effect or hemorrhagic conversion. A computed tomography angiography of the head and neck showed left cervical internal carotid artery with a small ulcerative plaque. She was treated with simvastatin, aspirin, and clopidogrel.

Transesophageal echocardiogram with agitated saline contrast showed delayed opacification of the left atrium after contrast administration, suggestive of intrapulmonary shunting. A large pulmonary arteriovenous malformation was visualized on computed tomography of the chest, with feeding artery arising from the right middle lobe pulmonary artery and drainage vessel to the superior right pulmonary vein.

PAVM is an uncommon cause of embolic stroke, but it is amenable to treatment with percutaneous coil embolization. Contrast echocardiography was a crucial first step in establishing the diagnosis of PAVM.
Introduction of continuous EEG (cEEG) at a community teaching hospital enhances care and leads to a reduction of hospital to hospital transfers

Ammar Malik, MD; Asif Abdul Hameed, MD; Kakageldi Hommadov, MD; Sonul Gulati, DO; Phillip Choi, MD; Dominic J. Valentino, DO

INTRODUCTION
Continuous EEG offers crucial information which can drastically change a patient’s outcome. Until recently, the cost of implementation was prohibitive and limited to tertiary care centers with Neuro-ICUs.
Technological advances have reduced the cost and remote access has made the interpretation of results feasible by alleviating hospitals from having an on-call epileptologist.

Our community teaching hospital would previously transfer all patients suspected of status epileptics/seizure disorders to tertiary care centers for cEEG monitoring. This would lead to discontinuity of care, added handoffs and potential for destabilization during transit.

Additionally, there is a loss of operating revenue to the hospital as these patients often carry additional comorbidities and contribute significantly to the ICU’s case mix index (CMI), which affects reimbursements from CMS.

METHODS
A retrospective chart review was completed of all patients who were placed on cEEG during its first year of implementation. Patients were admitted from the emergency department or the medical floors. Patients were followed from admission to discharge. We tracked patient outcomes including ICU LOS, days on cEEG and discharge disposition.

RESULTS
26 patients were placed on cEEG and a total of 28 studies were performed.
17 patients were admitted with an initial diagnosis of seizures.
9 were admitted with a different diagnosis but seizures were suspected after admission to the ICU.
5 were diagnosed with status epilepticus. Only two of these patients were transferred to a tertiary care center with Neuro-ICU for uncontrolled seizures.
1 of these patients had a tumor which required special neurosurgical intervention.
10 patients were found to have findings consistent with moderate to severe encephalopathy.
12 patients were ruled out for seizures and were either discharged home or to a SNF.

The average time on cEEG per patient was 2.3 days.

CONCLUSION
CCEG in the ICU is an invaluable tool that can now be utilized cost effectively in the community hospital setting.
It allows rapid diagnosis and treatment of seizures which can improve patient outcomes. This results in reduction of hospital to hospital transfers.
It improves the ability of hospitals to maintain a higher CMI in their ICU, with potential to cover the costs of the cEEG program.

Retaining these patients also allowed our house-staff to learn about the management of seizures in a more in-depth fashion.
This is a cost-effective diagnostic intervention which can now be safely and effectively used at community teaching hospitals such as ours.
Fluid overload or could it be something else?

Saketh Parsi, M.D. Lakshmi Priyanka Mahali, M.D.

LEARNING OBJECTIVES

- Diagnosis of Right Atrial (RA) myxoma should be suspected in patients with symptoms mimicking congestive heart failure associated with weight loss.
- Right atrial myxoma can create pro-thrombogenic environment and lead to clot formation causing pulmonary embolism

CASE PRESENTATION

History of Present illness:
- 71 year-old woman with hypertension presented with progressive ascending bilateral leg swelling for one week

Significant history:
- She also reported chronic dry cough, wheeze and dyspnea on exertion since over one month and unintentional weight loss of 40 pounds since over a year

Physical exam:
- Diastolic murmur on the left sternal border

Imaging:
- Transthoracic Echocardiography (TTE):
  - Severe right atrial dilatation and a pedunculated, mobile mass with multiple stalks attached to interatrial septum, consistent with an atrial myxoma

Computer tomography (CT) chest with contrast:
- Bilateral extensive pulmonary embolisms (PE), with right heart strain

Management:
- Temporary management: lovenox was started to prevent further PE and discharged on it
- Permanent management: Cardio Thoracic surgery follow up for resection of myxoma

DISCUSSION

Definition
- Atrial myxomas are benign pedunculated tumor attached to inter-atrial septum.

Location
- 80% are located in Left atrium and remaining 20% in right atrium.

Pathophysiology
- RA myxomas grow into the lumen and obstruct inflow and outflow of blood.

Clinical manifestations
- Tricuspid stenosis due to right ventricular outflow obstruction
- Right heart failure (peripheral edema, hepatomegaly, and ascites) due to inflow and outflow obstruction of right atrium
- Pulmonary embolism due to release of tumor fragments into the pulmonary circulation

Other non-specific presentations
- Malaise, anorexia, fever, arthralgia, weight loss due to the release of cytokine interleukin-6 (IL-6) from myxomas.

Treatment
- Anti-coagulation (AC)
- Long term management

CONCLUSIONS

- In patient with heart failure symptoms, PE and associated significant weight loss consider right heart myxoma, other differential diagnosis include malignant pericardial effusion, Severe tricuspid stenosis from infectious endocarditis, Chronic Atrial Septal Defect.
- Patients with right atrial myxomas should be managed with AC, if no medical contraindications. However, ultimate management is tumor resection
Cerebral Beads embolism after Transarterial Chemoembolization - A Serious Side Effect of a Relatively Safe Procedure

Jinan Al-naqeeb MD, MPH; Jason Mouabbi MD; Tarik Hadid, MD, MPH, MS, FACP
Ascension St. John Hospital, Detroit, Michigan

Introduction

- Transarterial chemoembolization (TACE) is a procedure commonly used for treatment of unresectable hepatocellular carcinoma (HCC).
- TACE involves the injection of lipiodol with or without a chemotherapeutic agent into the tumor feeding artery to disturb its blood supply and ultimately regress the tumor.
- Although TACE is generally considered a relatively safe procedure, serious side effects can occur. We present a case of cerebral beads embolism (CBE); an extremely rare side effect following TACE.

Case Report

A 64-year old man with biopsy-proven, poorly differentiated, locally advanced HCC, presented to the hospital for an elective TACE procedure (Figure 1). Medical history was significant for liver cirrhosis and previously treated hepatitis C and HIV with undetectable viral loads and CD4 cell count of 449. Following the procedure, his mental status became altered and he exhibited left-sided hemiparesis. A CT scan of the head without contrast was inconclusive. A follow-up MRI of the brain showed multiple punctate restricted diffusion lesions throughout both cerebral hemispheres, the brainstem, and both cerebellar hemispheres; surrounded by vasogenic edema (Figure 2). These findings were consistent with acute embolic infarcts.

Continuous cardiac telemetry did not record any evidence of atrial fibrillation. A trans-thoracic echocardiography and trans-esophageal echocardiography did not show any evidence of thrombosis in the left ventricle or left atrial appendage. He was diagnosed with CBE. Notably, TACE was conducted by mixing 150 mg of doxorubicin with LC Beads® (100-300 micro-millimeter in size made by BTG Interventional Medicine, UK). LC Bead® is a deformable microsphere that consists of a biocompatible, sulfonate-modified, N-Fil hydrogel.

Over his hospitalization, the patient gradually regained strength in the left side of his body and was transferred to sub-acute rehab. Unfortunately, he passed away two months later, due to end stage liver cirrhosis complicated by gastric variceal bleeding.

Discussion

- This case highlights a rare, yet catastrophic complication of TACE.
- Previous case reports described cerebral beads embolisms with the use of lipiodol beads. Unlike lipiodol beads, the LC beads that were used in our patient dissolve quickly and usually doesn’t cause permanent damage. Our patient recovered after few days.
- To our knowledge, this is the first reported case of dissolvable LC beads-induced embolic stroke.
- The occurrence of CBE was found to be related to shunting between the tumor feeding artery and the pulmonary vein. Previous case reports mostly described pulmonary shunts, and less commonly cardiac shunts.
- In our patient, no cardiac shunt was found, but a pulmonary shunt was not investigated as a source, although suspected.

Take home message

- We recommend that patients undergoing TACE should be screened for the presence of both cardiac and pulmonary shunts beforehand, to decrease the incidence of such an unfortunate complication.

References

## Objectives & background

- Readmissions to hospitals cost the United States over $17 billion annually, with $12 billion of this amount being spent on potentially avoidable readmissions.
- Information is not always transmitted to the primary care provider, which in turn results in sub-optimal care.
- Transitions of care is an ACGME Milestone, however, it is not necessarily a part of the residency curriculum.
- Numerous interventions have been proposed to address this issue. One such intervention is developing transition of care team which serve as a bridge between hospitals and primary care.
- Piedmont Athens Regional (PAR) is a non-profit hospital which serves 17-counties in northeast Georgia. Over 40% of patients discharged from the hospitalist service at PAR do not have access to a primary care physician (PCP).
- To address these needs, we designed and implemented a resident-led transition of care team. Through our initiative, we provided easy access to primary care and ensured proper transitioning from the inpatient to the outpatient setting.
- The TCI is led by residents and housed in the Internal Medicine Residency. Care providers included teaching faculty, residents, pharmacist, and a social worker.
- Objectives: Implement TOC curriculum, reduce readmission rate and improve show rate in our residency community care clinic.

## Methods

- Residents designed and implemented a TOC process that has 3 components intervention including:
  1. Discharge nurse calls the TOC hotline
  2. Post discharge phone call within 24-48 hours
  3. Transition of care visit within 7-14 days with a resident, pharmacist, and a social worker.
- A retrospective chart review of PAR patients discharged to the TCC was conducted.
- The inclusion criteria was:
  - Patients discharged from PAR from Dec 2017 to March 2018
  - Do not have PCP at time of discharge

## Results

<table>
<thead>
<tr>
<th>Months</th>
<th>TOC Show Rate</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>1</td>
<td>30%</td>
</tr>
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<td>2</td>
<td>40%</td>
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<td>50%</td>
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<td>4</td>
<td>60%</td>
</tr>
<tr>
<td>5</td>
<td>70%</td>
</tr>
</tbody>
</table>

## Discussion

- The study results demonstrated a decrease of 30 day readmission rate but it was not statistically significant.
- Interestingly the TOC visit show rates increased dramatically after the post d/c phone calls.
- TOC is a built in experience in our curriculum. Each week we have a TOC lead intern and resident.
- Our TOC team assessed not only the medical aspects but also the impact of socioeconomic determinants of health such as homelessness, poverty and other non-medical causes of readmissions and ED use.

**Cost Savings**

- The initiative saved 780,000$ in the three months period.

## Conclusion

- It is concluded that performing the post discharge phone calls motivates patients to show up for the clinic appointment.
- Access to primary care after hospital discharge reduces hospitalizations.
- Furthermore, the high value care provided at a residency TCC reduces the cost of health care with substantial savings to the larger health care institution.
- Future plans include looking assessing geographical effects on readmissions, addressing the three diagnoses with the highest readmission rate.

## References

N\textsubscript{2}O laughing matter: a case of subacute combined degeneration induced by recreational nitrous oxide inhalation

Steven Wu, MD; Talar Kavafyan, MD; John Carmody, MD • Department of Internal Medicine, Huntington Hospital, Pasadena, CA

**Introduction**

Nitrous oxide has long been used for anesthetic purposes, but it is also recognized as a recreational inhalant for its euphoric effects. This case illustrates a patient who presented with inability to walk and was diagnosed with subacute combined degeneration (SCD), as a result of using nitrous oxide. An interesting constellation of signs, symptoms, laboratory abnormalities, and radiographic findings are associated with SCD, and it is important to exclude other differential possibilities.

**Case description**

The patient is a 32-year-old lady with no medical problems, who presented with difficulty ambulating for the past 1 month. She began to notice intermittent numbness and tingling in her toes and fingertips 7 months ago, which have spread to her calves and hips within the past month. She reported difficulty discerning where her legs were relative to the floor, and her legs became weak to the point that she required a wheelchair. She was 12 weeks pregnant and planned to terminate the pregnancy because of high risk. Her obstetrician referred her to a neurologist, who referred her to the emergency department. She denied any bowel or bladder incontinence, or loss of sensation in the pelvic area. She was not vegan or vegetarian.

Upon further questioning, it was revealed that for the past several months, she had been increasing her use of so-called “whippets,” referring to the nitrous oxide canisters used in refillable whipped cream containers. On examination, she had significant symmetric lower extremity weakness, accompanied by decreased proprioception, vibration sense, and deep tendon reflexes. She was found to have macrocytosis without anemia, hypersegmented polymorphonuclear leukocytes, and vitamin B12 deficiency with elevated homocysteine and methylmalonic acid levels; folate level was normal and intrinsic factor antibody was negative. MRI of the cervical and thoracic spine showed diffuse hyperintensity of the dorsal and central spinal cord.

Neurology was consulted; she was diagnosed with SCD from vitamin B12 deficiency, secondary to nitrous oxide use. She received vitamin B12 supplementation. She required maximum assistance on initial physical therapy evaluation, but she only required minimal assistance to ambulate with a walker when she was discharged home on hospital day 15.

**Results**

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>Reference</th>
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<tbody>
<tr>
<td>White Cell Count</td>
<td>8.1 K/L</td>
<td>4.4-10.8 K/L</td>
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<tr>
<td>Absolute Neutrophil Count</td>
<td>7.5 K/L</td>
<td>2-7.7 K/L</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>12.5 gm/dL</td>
<td>13-15.5 gm/dL</td>
</tr>
<tr>
<td>MCV</td>
<td>103.4 fl</td>
<td>81-99 fl</td>
</tr>
<tr>
<td>Platelet</td>
<td>304 mc/L</td>
<td>150-400 mc/L</td>
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<tr>
<td>Vitamin B12</td>
<td>164 mc/L</td>
<td>211-461 mc/L</td>
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<tr>
<td>Folate</td>
<td>11.92 ng/mL</td>
<td>2.6-25 ng/mL</td>
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<tr>
<td>Homocysteine</td>
<td>33 mc/mL</td>
<td>&lt;10 mc/mL</td>
</tr>
<tr>
<td>Vitamin B6</td>
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<td>10-32 mc/mL</td>
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<tr>
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<td>Intrinsic factor antibody</td>
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<td>Negative</td>
</tr>
<tr>
<td>Urine Toxicology</td>
<td>Positive for cannabis</td>
<td>Negative</td>
</tr>
<tr>
<td>Urine pregnancy</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>Peripheral Blood Smear</td>
<td>Hypersegmented PMN Lymphocytes</td>
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</tr>
</tbody>
</table>

**MRI cervical, thoracic, and lumbar spine without contrast**

Expanded cervical spinal cord with abnormal parenchymal signal spanning the cervicomedullary junction to the upper thoracic region. The cord hyperintensity is predominantly within the dorsal and central parenchyma. Further clinical history indicates B12 deficiency. The pattern is therefore highly likely to reflect subacute combined degeneration. Differential considerations would include transverse myelitis, viral myelitis, acute disseminated encephalomyelitis (ADEM), a demyelinating process such as neuro myelitis optica.

**MRI brain without contrast**

1. Unremarkable noncontrast MRI of the brain.
2. No parenchymal white matter lesions noted.
3. Signal abnormality in the superior spinal cord, better visualized on dedicated MRI of the cervical spine.

**Discussion**

This case demonstrates the devastating and potentially irreversible neurologic sequelae due to nitrous oxide use. In particular, it is important to note that nitrous oxide can cause demyelination of the dorsal and lateral spinal cord by irreversibly inactivating vitamin B12, an important metabolite in methylation reactions and DNA synthesis. In fact, it has been documented in similar cases that prophylactic vitamin B12 supplementation in the setting of nitrous oxide use does not always prevent the development of SCD; treatment of SCD with vitamin B12 supplementation unfortunately does not always improve functional recovery, either.

**References**

Coxsackie B Infection Presented as Severe Acute Pancreatitis and Pneumonia with Bilateral Pleural Effusion in a Navy Recruit

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Internal Medicine, Chicago Medical School at Rosalind Franklin University of Medicine and Science, North Chicago, IL

Introduction
Coxsackie viruses are enteroviruses that belong to the Picornaviridae family. Coxsackie group B viruses have been associated with many clinical syndromes including pleurodynia, pleural effusion, pneumonitis, pericarditis, myocarditis, and pancreatitis. There are very few reports and studies concerning Coxsackie virus infection with pulmonary involvement or pancreatitis.

Case Description
A 18-year-old male previously healthy Navy recruit from Arizona, fell ill with a sore throat, cough, pleuritic chest pain, and subjective fever. Four days later, he developed severe epigastric radiating to his back associated with nausea and vomiting that prompted medical attention. The patient had no personal or family history of gallstone or liver disease. He denied using any medications, alcohol or recreational drug use. He reported sick contacts. On physical examination, his temperature was 100.5°F and heart rate 112 bpm. He had coarse breath sounds and severe tenderness to palpation in the epigastric region. There was no rash on the body. Laboratory investigation showed leukocytosis (17,000 K/uL), elevated lipase to 4268 U/L. Renal and liver functions were normal. CT chest showed scattered ground glass opacities in both lung fields. CT abdomen showed mild pancreatic edema with peri pancreatic fluid collection involving the tail of the pancreas and small area of pancreatic edema of the head, neck, and body of the pancreas, sparing the tail of the pancreas. The patient was treated symptomatically with IV hydration and analgesics. Two days after admission, his abdominal pain worsened and he developed hypoxic respiratory failure requiring supplemental oxygen. Repeat CT scan showed worsening of severe acute pancreatitis with bilateral pleural effusions. Supportive treatment was continued. The patient had gradual clinical recovery over nine days with resolution of abdominal pain, cough, chest pain, and return of appetite. Leukocytosis resolved and lipase trended down to normal. Recruit was discharged in stable condition.

Images:

Figure 1a: CT Chest findings on admission showing no intrapleural fluid accumulation.

Figure 1b: Slight hyperenhancement and moderate pancreatic edema of the head, neck, and body of the pancreas, sparing the tail of the pancreas.

Repeat CT imaging of chest and abdomen were performed on day four of hospitalization.

Figure 2a: Bilateral pleural effusions, greater on the left side than the right.

Figure 2b: Worsening of pancreatic edema of the pancreas with involving the tail of the pancreas and small area of necrosis around the body is seen.

Discussion
Acute Pancreatitis has diverse etiologies with viral etiology involving only a small subset. Imrie et al carried out a prospective study on 116 patients with acute pancreatitis with incidence of idiopathic pancreatitis in this study was 5.2% (six patients). Among them, five patients exhibited significant rising antibody titers to Coxsackie B or Mumps. There are relatively few case reports concerning Coxsackie virus infection with pulmonary involvement and incidence remains unknown. Our case illustrates the importance of considering Coxsackie B infection as a rare cause of acute pancreatitis especially with concomitant respiratory symptoms.

References
A 19-year-old man presented to the emergency department with left axillary abscesses and suddenly developed anxiety with palpitations.

**PMH:**
- Crohn’s disease on infliximab
- Recurrent draining superficial abscesses

**Initial vitals:**
- Afebrile, HR 230s, Normotensive

**Physical exam:**
- Overall well appearing
- Regular rhythm tachycardia without murmurs
- No respiratory distress
- Lungs clear bilaterally
- Multiple healed superficial abscess scars
- Draining abscesses in left axilla and thigh
- No other areas of skin erythema or tenderness

**Labs:**

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<tbody>
<tr>
<td>13.9</td>
<td>10.1</td>
<td>132</td>
<td>95</td>
<td>5</td>
</tr>
</tbody>
</table>

- ECG: supraventricular tachycardia, HR 234
- CXR: right upper lobe infiltrate
- Echo: unexpected avascular mediastinal mass

**Imaging**

**Cardiac MRI:**
- Mass effect was noted on right and left atria, aortic arch, and inferior vena cava.
- The superior vena cava and right pulmonary artery and veins were circumferentially encased and significantly narrowed.
- The trachea, mainstem bronchi, and distal right lung bronchi were encased without mass effect.

**Differential Diagnosis**

- Lymphoma
- Tuberculosis
- Endemic fungal infection
- Sarcoma
- Carcinoma

**Further Diagnostic Course**

- EBUS with biopsy of mass was nondiagnostic but negative for malignancy.
- Flow cytometry of serum was negative for malignancy.
- **Histoplasma** urine antigen, and **Histoplasma, Blastomyces, and Aspergillus** serum antibodies were negative.
- Tissue and sputum cultures were negative for bacteria, fungi and mycobacteria.
- Open biopsy results showed dense connective tissue without signs of malignancy, consistent with the diagnosis of fibrosing mediastinitis.

**Discussion**

Fibrosing mediastinitis is a rare disease often associated with prior or concurrent Histoplasma infection. Idiopathic fibrosing mediastinitis is an even more rare subset of pathology with no clear etiology. There are only dozens of reported cases in the United States. Fibrosis mediastinitis has no established effective medical treatment. Surgical interventions for compression of structures have only been shown to be temporizing. Immunosuppression has shown some effectiveness in case reports.

This case further illustrates the often insidious onset of this disease that typically presents due to compression of mediastinal structures.
CAN EMOTIONS REALLY BREAK YOUR HEART?

- A healthy, young female with no discernable atherosclerotic risk factors presented with sudden-onset, non-exertional chest pain
- Patient had significant stress in the week prior to presentation
- What if failure to recognize this overlooked disease results in a standard-approach-treatment measure that worsens the patient condition?
- What if recognizing it will help find related problems preventing patient mortality?
- What is our responsibility as internists in educating these patients about risk and life style (avoiding valsalva, intense exercise, hormonal therapy, future pregnancy)?

BASHAR ATTAR KADHIM MD
FAISAL FA’AK MD
Use of Whole-Genome Sequencing to Guide a *C. difficile* Diagnostic Stewardship Program

Kunal Jakharia\(^1\) MBBS, Ghassan Ilaivy\(^2\) MD, Siobhan Moose\(^3\), Masashi Waga\(^4\), Joel McAlduff\(^4\) MD, Lynne Karanfil\(^5\), Patrick McGann\(^6\) PhD, Glenn Wortmann\(^2\) MD

\(^1\)Department of Internal Medicine, MedStar Washington Hospital Center, Washington, DC; \(^2\)Infection Prevention, MedStar Institute for Quality and Safety, Columbia, MD; \(^3\)Infection Prevention, MedStar Washington Hospital Center, Washington, DC; \(^4\)Information Services, MedStar Health, Columbia, MD; \(^5\)Multi-Drug Resistant Organism Repository and Surveillance Network (MDRN), Walter Reed Army Institute of Research, Silver Spring, MD

**BACKGROUND**

- Hospital-onset *C. difficile* infection (HO-CDI) is defined as a case occurring after the third day of hospitalization
- Rates at Medstar Washington Hospital Center were 50% greater than predicted despite multiple interventions
- Published data suggest that 4-15% of patients can be colonized with *C. difficile* at hospital admission
- Using epidemiological and whole-genome sequencing data to define our transmission pattern, a diagnostic stewardship intervention was instituted

**METHODS**

- Baseline data from Jan 2017-May 2017 was used to determine the HO-CDI rate
- Isolates from CDI cases were sequenced for strain relatedness and epidemiologically analyzed using a single nucleotide polymorphism (SNP)-based approach
- In June 2017, a QI project reviewed all orders for CDI for appropriate indications:
  - >3 loose stools/24 hours
  - Absence of laxative administration
  - Presence of fever/leukocytosis or a history of inflammatory bowel disease
  - Tests not meeting appropriate indications were recommended for cancellation

**RESULTS**

- WGS assigned 36 isolates to 19 different multi-locus sequence types
- SNP-based analysis indicated closely related, but non-identical strains, inconsistent with recent nosocomial transmission

**CONCLUSION**

- WGS revealed that nosocomial transmission of *C. difficile* was an unlikely cause for our elevated CO-CDI rate
- A diagnostic stewardship intervention which focused on identifying community-acquired infection and avoiding over-testing was associated with a sustained decrease in the HO-CDI rate which has persisted for 9 months
- Since acceptance of this abstract, our HO-CDI rate has continued to fall, with rates of 4.4 (March), 5.3 (April), 1.3 (May), 4.6 (June), 2.6 (July), and 2.6 (August) for an overall rate of 5.7 since project initiation

**REFERENCES**


Eyre DW et al. Diverse Sources of *Clostridium difficile* Transmission. *Clinical Infectious Diseases*. 2018;56(12):1763-1768. doi:10.1093/cid/ciy629


**TABLE:**

<table>
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<td>34</td>
<td>1</td>
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<tr>
<td>156</td>
<td>1</td>
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</tbody>
</table>

**Figure:**

- MWHC HO-Clodstridium difficile Cases and Rate
- EMR Algorithm Begins
- PI Project Begins
- Review of orders – QI Project starting June 2017
- 646 orders for all C. diff tests reviewed
- 421 (65%) met criteria
- 225 (35%) did not meet criteria
- 64 (15%) were positive
- 9 (4%) not cancelled were positive
- HO-CDI rate decreased from 11.67/10k in the 5-month baseline period to 7.13/10k in the 9-month intervention period (p=0.0008)
A Rare Case of Gastric Cancer Metastasizing to the Colon
Bing Chen MD, Neelesh Rastogi MD, Shu Min Lao DO
Department of Medicine, Mount Sinai St Luke’s and West, New York City, New York

Introduction

- Gastric cancer is the sixth most common cancer and third leading cause of cancer death worldwide.
- Patients may present with distant metastatic disease. However, metastases rarely involve the colon.

Case Presentation

- A 39-year-old African American male with no significant past medical history was presented to the emergency department by his primary care provider for a decreased hemoglobin of 7.1 (Hgb 11.2 six months prior). He complained of mild postprandial right lower quadrant abdominal pain associated with intermittent constipation for a few days prior to his admission without bloody stool or melena. On examination, he was hemodynamically stable and noted to have mild tenderness and firmness in the right lower quadrant of the abdomen.
- Patient underwent CT abdomen and pelvis with contrast, upper endoscopy, and colonoscopy. Biopsies from the proximal stomach and ascending colon were obtained. Biopsies from the stomach and colon confirmed poorly differentiated gastric adenocarcinoma. He remained stable and was discharged on hospital day 7 for further management as an outpatient.
- One week following hospitalization, patient underwent diagnostic laparoscopy with peritoneal implant biopsy which was consistent with metastatic adenocarcinoma. Patient is currently enrolled in a clinical trial for stage IV gastric adenocarcinoma.

Discussion

- Colonic metastases from gastric cancer are rare, typically attributed to peritoneal carcinomatosis, linitis plastica, and poorly differentiated adenocarcinoma [1]. Several cases of multiple colonic metastases from poorly differentiated gastric adenocarcinoma, presenting as colonic polyposis or multiple flat elevated lesions, have been reported [2].
- We demonstrate a very rare case of primary gastric signet-ring cell carcinoma with a solitary colonic metastasis, presenting as severe stenosis. The most likely method of metastasis in this case could be via peritoneal seeding.

Reference

Improving Medication Reconciliation During Hospital Admission

Dr. Amirtha Dileepan and Dr. John Pamula

Introduction

Adverse drug events are a leading cause of morbidity and mortality in healthcare systems. Nearly 30% of medication lists have one or more errors, and 1/3 of these have potential for harm. Resulting costs are estimated to be billions of dollars. An accurate, up-to-date medication list is therefore essential to patient safety. Half of errors occur during admission or discharge. We address re-accommodation during transitions of care. A standardized process and shared accountability among patient, family, and support staff have shown the best improvements.

We measured errors in admission medication reconciliation and the effects of 2 interventions: resident education plus a brief "best practices" checklist, and a dedicated pharmacy tech to verify medications with outside pharmacies.

We focused on "high-risk" medications, defined as those involving dual antiplatelet therapy, anticoagulation, insulin, or hypoglycemics, or opioids.

Methods

We reviewed 6 weeks (42 days) of admissions to the internal medicine teaching service at Beth Israel Hospital. The off-duty resident, nurse, or pharmacy tech collated an updated home medication list (if one existed), with errors noted. The medications were reconciled with the medications recorded in ePharm by the admitting physicians. Errors were recorded as additional medication, omission, or route/dosage/amount. Results were calculated as the percentage of errors compared to medications and as error per patient admission. We recorded separate results for total errors and for high-risk.

The resident education intervention occurred on day 16. The pharmacy tech intervention was on an admissions during normal business hours.

Results

Overall there were 158 admissions, 1,215 medications, and 106 high-risk medications. The interventions had 38 admissions, 112 errors in 405 medications (28%), and 11 errors in 44 high-risk medications (24%). Post-intervention had 70 admissions, 136 errors in 610 medications (22%), and 32 errors in 61 high-risk medications (23%). Error rate reduced from 3.2 to 1.5, and high-risk errors/medication admission improved from 0.3 to 0.2. We plotted the daily errors/admission for the 42-day study period which showed a 5-day trend with zero errors occurring immediately after the intervention.

62 admissions had no pharmacy tech. These had 71 errors in 560 medications (12%). 3 errors in 41 high-risk medications (12%) average of 1.2 errors/admission and 0.1 high-risk errors/admission. 26 admissions were with the pharmacy tech. They had 157 errors in 428 medications (36%). 26 errors in 44 high-risk medications (31%), average of 4.2 errors/admission and 0.4 high-risk errors/admission.

Conclusion

Our study showed resident education led to significant improvement in total errors and non-significant improvement in high-risk errors on admission medication reconciliation. The dynamic data showed the greatest impact was immediately following intervention.

The pharmacy tech was associated with increases in total and high-risk errors. This may reflect improved accuracy of the medication list rather than a true negative impact.

This project will be continued with other residents and staff, which we hope will sustain positive impact and reveal further areas for improvement.

References


Importance of Adequate Screening Before Immunosuppression: Leprosy Exacerbation After Treatment with Adalimumab
Pedro D. Gil de Rubio-Cruz MD¹, Carla N. Cruz-Díaz MD², Meilyn Reyes-Pérez MD¹, Aida L. Quintero-Noriega MD²
University of Puerto Rico: ¹Department of Internal Medicine, ²Department of Dermatology

INTRODUCTION
- Increased use of both Biologics and DMARDs has significantly improved outcomes in the treatment of inflammatory conditions.
- Their use still carries the potential for serious adverse reactions, some of which may be extremely rare, making their diagnosis challenging.

CASE PRESENTATION
- 57-year-old man without known systemic illnesses, who worked as a dishwasher, traveled twice to the Dominican Republic, lives with his wife who is Dominican, and reports chronic use of marijuana.
- 15 years ago – bilateral hand numbness
- 10 years ago – finger contractures, hand burns, and recurrent skin bullae; diagnosed with contact dermatitis vs bullous disease
- As finger contractures worsened, 7 years ago he was diagnosed with rheumatoid arthritis and started on methotrexate and adalimumab.
- Hand numbness progressed to complete loss of sensation, which he recognized after burning while cooking without feeling any pain.
- MTX and adalimumab were discontinued and a skin biopsy showed acid fast positive bacilli.
- Diagnosed with Hansen’s Disease, mid-borderline variant.
- Started on Dapsone, Rifampin, Clofazimine, Prednisone, and Methotrexate, resulting in significant improvement of skin lesions and lagophthalmos.

DISCUSSION
- Both rheumatologic and dermatologic manifestations associated with Hansen’s disease could lead to misdiagnosis.
- Immunosuppression is a risk factor for the development of leprosy. TNFα inhibitors impair immunologic response by directly affecting the formation of granulomas. Nowadays they are used more frequently to treat inflammatory conditions, therefore, adequate screening before immunosuppression is imperative to prevent exposing patients to serious adverse reactions.
- Non-infectious adverse reactions such as heart failure, interstitial lung disease, malignancy, and demyelinating diseases can be prevented to some extent by careful assessment of risk factors, physical examination, chest imaging, baseline echocardiography, and age-appropriate cancer screening. Infectious adverse reactions can be diminished by inquiring about risk factors and by more directed tests, such as tuberculin skin test and serology for specific organisms.

REFERENCES

PHYSICAL FINDINGS

CLINICAL COURSE

- Bilateral madarosis (loss of eyebrows)
- Right lagophthalmos (unable to close eye)
- Enlarged great auricular nerve
- Improvement of erythematous scaly plaques after 3 months of treatment
- Darkening of the skin secondary to clofazimine
- Nonreducible finger contractures with erosive ulcers and muscle atrophy before and after 3 months of treatment.

Fite stain skin biopsy showing acid fast positive bacilli
Cardiovascular Risk Assessment in United States Subjects for Deployment to Antarctica

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Department of Medicine, Division of Cardiology UTMB, Galveston TX

Background
Cardiovascular (CV) evaluation has an important role in the medical screening of candidates for deployment in Antarctica under the United States Antarctic Program (USAP). Due to limited medical care and hazards of transportation during harsh winter weather, an adverse cardiac event would endanger subject safety and jeopardize the mission objectives.

Methods
All subjects for deployment are required to pass a physical qualification protocol under the United States Arctic Program (USAP). We reviewed CV history, physical examination, EKG’s, laboratory data, Framingham risk score (FRS), echocardiograms, and stress tests (ST) of all subjects.

Results
From October 2013 to November 2017, 136 subjects were screened for deployment, mean age 48±4.7 years, 24 (17.7%) women & 112 (82.3%) men. Nine subjects (6.6%) had known coronary artery disease. A 10-year risk for CV disease by FRS was calculated. Risk score of < 10% was considered low, 10% to 20% as intermediate, and > 20% as high.

Seventy (51.4%) subjects had further CV testing. Twenty-five (35.7%) had exercise stress test with ischemia in 5(7.1%), 2(2.8%) had normal coronary angiograms, and the remaining tests were unremarkable. Out of a total of 136 subjects, 129 (94.9%) subjects were deployed. None of the deployed subjects had cardiac events during their assignment to USAP stations, follow up period ranging from 8 to 242 days.

Clinical Characteristics of Study Subjects

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<thead>
<tr>
<th>Characteristic</th>
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<td>112</td>
<td>82.4</td>
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<tr>
<td>Smokers</td>
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</tr>
<tr>
<td>Former</td>
<td>31</td>
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<td>Current</td>
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<td>PAD</td>
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<tr>
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<td>Car. Anglo. (CAD)</td>
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Additional Tests Performed

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<td>23.9</td>
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<tr>
<td>Echocardiogram and Nuclear stress test</td>
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</tr>
<tr>
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<tr>
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<td>3.0</td>
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<tr>
<td>EKG</td>
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<td>1.5</td>
</tr>
<tr>
<td>Other*</td>
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</tr>
<tr>
<td>Total</td>
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</table>

* Saline contrast study
Endocrine and EP evaluation
Echocardiogram not done
Evaluation by cardiologist to assess significance of PFO

Stress Test Results

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<td>Not done</td>
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<td>Exercise stress echo</td>
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<tr>
<td>Nuclear stress test</td>
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<tr>
<td>Total</td>
<td>24</td>
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</tbody>
</table>

Framingham Risk scores

*See diagram for detailed risk score analysis*

Conclusion
Our study, for the first time, describes the application of screening protocols for cardiovascular risk assessment in subjects for deployment to Antarctica.

The current screening process for deployment to USAP stations appears adequate in identifying subjects with low risk of cardiac events during the follow up period.
Rapid Progressive Dementia with Sporadic Creutzfeldt-Jakob Disease
Sinan Khayyat, MD, Daly Al-Hadeethi, MD, Mohinder Vindyhal, MD, M.Ed.

Introduction
- Creutzfeldt-Jakob disease (CJD) is a rare human prion disease with progressive, fatal encephalopathy characterized by dementia, cerebellar ataxia, and visual disturbances.
- CJD is caused by an abnormal protease-resistant isoform of prion protein (PrPsc), a misfolded version of the normal cellular isoform (PrPC).1,2
- The incidence rate is approximately 1 case per million population per year with a worldwide distribution.

Case Description
- An 85-year-old man presented with confusion, aphasia, and episodic seizure-like activity in his right upper extremity with right eye twitching for two weeks duration.
- Prior occupation history, as a pathologist. He quit 20 years ago.
- Neurological exam: stupor, aphasia, verbally non-responsive, generalized weakness, and lower extremity myoclonic movements. Cogwheel rigidity was noticed with only equivocal left Babinski.
- MRI showed generalized cerebral atrophy, scattered focal and confluent areas of nonspecific T2 bright signal (arrow) in the periventricular and subcortical white matter. See figure 1 and 2.
- EEG showed diffuse slowing with transient generalized epileptiform discharges.
- LP with CSF studies ruled out common meningitis/encephalitis as well as parasitic etiologies.
- The CSF 14-3-3 Ag was elevated, Tau protein level was >4000, and RT-QuIC assay was positive.
- Diagnosis of probable CJD was given and the patient was discharged to hospice and passed away soon after.
- Brain autopsy was done and results were evident for sporadic CJD with MM1 gene sequence.

Discussion
- Definitive diagnosis of CJD is made with a brain tissue biopsy and western blot confirmation of protease-resistant PrP and presence of scrapie-associated fibrils.
- Criteria for the diagnosis of probable sporadic CJD in patients presenting with rapid progressive dementia are 2 of the following: myoclonus, visual or cerebellar signs, pyramidal/extrapyramidal signs, akinetic mutism, and a positive result of either a typical EEG with periodic sharp wave complexes and/or a positive 14-3-3 cerebrospinal fluid (CSF) assay.
- Relating patient’s prior occupation as a pathologist to a probable health care associated CJD still weak though not yet confidently to be dismissed. So far very few cases have been reported in literature and taking in consideration patient remote history, connection is difficult to be confirmed.
- New diagnostic test, Real Time-Quaking-Induced Conversion (RT-QuIC) with high sensitivity and specificity using PrPsc ability to misfold PrPc and hence can confirm presence of PrPsc in patients CSF with suspected CJD. Ongoing studies to develop faster technique as current technique might take up to 90 hours.3
- No treatment has been proposed so far CJD. Few medications like Flupirtine have been reported to slow down cognitive impairment though lack evidence and shows no effects on survival.
- Prognosis with CJD has a rapid, deteriorating course invariably, with death generally within two years of symptom onset.
- Early diagnosis allows patients and their families to prepare for the expected disease course.

References
1 WHO manual for surveillance of human transmissible spongiform encephalopathies including variant CJD WHO.2003
3 Pract Neurol. 2019 Feb;19(1). RT-QuIC: a new test for sporadic CJD. Green AJE1. PMID 30282760
Hemophagocytic Lymphohistiocytosis: A Case of Fulminant Hepatic Failure in a 50-year-old
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1 Department of Medicine, Memorial University of Newfoundland, St John’s, Canada
2Department of Anesthesia, Memorial University of Newfoundland, St John’s, Canada
3Department of Critical Care, University of Ottawa, Ottawa, Canada
* Equal Contribution

Clinical History

- We describe a case of hemophagocytic lymphohistiocytosis (HLH) in a 50-year-old man evaluated for sudden onset hypotension, hypoglycemia, and decreased level of consciousness. The patient was en route to another tertiary centre via Medivac for further workup of fulminant liver failure when he clinically deteriorated on transport.
- He presented one week prior with a fever of unknown origin and jaundice. Prior to this, he was a well man with a one week prodrome of viral upper respiratory tract infection symptoms. Past medical history was significant for spherocytosis with splenectomy and mild asthma. He was a non-smoker, non drug user and monogamous.
- He was treated as presumed septic shock, where his ICU course was complicated by pancytopenia, acute kidney injury with profound acidosis, recurrent GI bleeds and disseminated intravascular coagulation (DIC). Stabilization required intubation and ventilation, broad spectrum antibiotics, multiple vasopressors, blood product transfusions and continuous renal replacement therapy.
- Besides a bone marrow aspirate, all the other diagnostic criteria for HLH were met. We present the case here and describe the workup and stabilization.

Diagnostic Criteria

- Hypertriglyceridemia and/or liver function test abnormalities.
- Fever > 38.5°C.
- Spleenomegaly.
- 2+ Cytopenia.
- Hemoglobin nadir < 77 g/L.
- Serology for SLE.
- Hypertriglyceridemia and/or hypofibrinogenemia.
- Hemophagocytosis.
- NK cell activity (low/absent).
- Ferritin > 500 ng/mL.
- Elevated soluble CD25.

Diagnostic Criteria

Initial investigations to determine the etiology of fulminant liver failure with persistent fever and hemodynamic instability were unhelpful. Trends of AST, bilirubin and lactate are shown in Figure 1.

Figure 1. Trend of select biochemical markers during the hospital admission. High dose steroids was initiated on Day 2 of admission. AST (not shown) reflected the ALT trend (shown).

Intravascular hemophagocytosis was noted. Blood smear showed Burr cells, Jolly bodies and spherocytes.

A bone marrow aspirate and biopsy confirmed the diagnosis of hemophagocytic syndrome.

CD25 level was elevated at 38,844 (ref 223-710 U/mL).

Since the diagnosis, the patient improved clinically and was discharged from the ICU.

Differential Diagnosis – Hyperferritinemia

Ferritin is the cellular storage protein for iron, where its physiologic roles include iron storage/binding and immune response. It is commonly described as an acute phase reactant. The differential for a ferritin > 10 000 ng/mL is limited and includes iron overload (35%), liver disease (27%), hematological malignancy (16%) and the rest (22%). Less common causes of hyperferritinemia are solid malignancy, infections, hemoglobinopathies and lastly HLH (6%).

Extreme hyperferritinemia may be sensitive for a diagnosis of HLH, but has a very poor positive predictive value. Hence, extreme hyperferritinemia should prompt clinicians to consider the diagnosis of HLH, but rule out other causes for elevated ferritin levels.

Hemophagocytic Lymphohistiocytosis

HLH is a potentially life threatening syndrome of excessive inflammation and tissue destruction due to excessive immune activation. Immune activation by cytokine production causes activation of macrophages and T-cells leading to subsequent hemophagocytosis. Primarily, HLH is a pediatric condition, however the disease is also observed in all ages. HLH, both primary and secondary, often have an underlying genetic defect exacerbated by a trigger (most commonly – infection).

However, in the clinical care setting, over 75% of HLH diagnoses are missed with a subsequent mortality of over 40%.

Thus, clinicians should consider the diagnosis of HLH in patients with any of protracted fever, splenomegaly, unexplained cytopenias, fulminant liver failure and/or extreme hyperferritinemia.

References

Lachmann, et al. Hemophagocytic Lymphohistiocytosis: potentially underdiagnosed in Intensive Care Units. Intensiv, 2018;194.158

Acknowledgements

We thank the family of the patient described for allowing us to share his details. We also thank the medical staff at the St. John’s Health Sciences Centre for their help and expert care of this critically ill patient. We would like to thank Dr. Nód Höfling for the bone marrow biopsy/aspirate slides.

Conflict of interest: none identified.

Differential Diagnosis - Fulminant Liver Failure

This 50 year old previously well male presented with acute fever and jaundice and now has fulminant liver failure. He has elevated LFTs (>100 U/LN), DIC and hepatic encephalopathy. The differential with salient history and investigations are noted.

This was accompanied by hyperferritinemia, hypoglycemia and hypertriglyceridemia.

Common Causes of Fulminant Liver Failure:

- Drug induced – minimal Tylelson use, denied overdose.
- Viral hepatitis – negative viral hepatitis screen.
- Drug reactions – no premedication medications.

Rarer Causes of Fulminant Liver Failure:

- Autoimmune Hepatitis – negative serology.
- Ischemic Hepatitis – no evidence of prolonged hypotension.
- Budd-Chiari/Venoocclusive disease – negative CT scan.
- HELLP Syndrome
- Malignancy – no evidence on CT.
- Toxic exposure (mushrooms) – denied any toxic exposure.
- Hemophagocytic Lymphohistiocytosis – elevated ferritin.
- Heat stroke – no evidence of heat stroke on history.

Figure 2. Bone marrow biopsy (2A) and aspirate (2B) showing hemophagocytosis including red blood cell fragments and nucleated red blood cells. Stains: Bone marrow (BM) aspirate (Wright-Giemsa stain); biopsy (hematoxylin and eosin stain).
Re-challenging Non-Small Cell Lung Cancer Patients with Immune Checkpoint Inhibitors – A Systematic Review of Safety and Efficacy

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Background

- Immune checkpoint inhibitors (ICPI) have revolutionized the management of Non-Small Cell Lung Carcinoma (NSCLC), with improvement in overall survival.
- The aim of this study was to analyze the safety and efficacy of resuming ICPI therapy, particularly inhibitors of programmed cell death receptor and receptor ligand (PD-1/PD-L1) in NSCLC patients who were previously treated with an ICPI agent.

Methods

- A systematic search of Medline, Embase, Scopus, and Cochrane Library for studies from January 2010 to August 2018 was performed using controlled vocabulary as well as natural language terms for ICPIs.
- Studies enrolling NSCLC patients who previously received ICPIs and were re-challenged with PD-1/PD-L1 ICPIs were included.
- Data were compiled from the included studies regarding the response to therapy as well as the reported immune related adverse events (irAEs) attributed to ICPI re-challenge.
- Infectious adverse events and general patient reported adverse events such as fatigue were excluded as these did not constitute an irAE.
- Descriptive statistics were employed to report the findings of our systematic review.

Results

- Overall, 3426 initially screened studies yielded 3 studies (2 case series and one case report) enrolling 24 patients, of whom 6 (25%) were female.

- All patients had previously received a PD-1/PD-L1 ICPI. In 23 (96%) patients, the initial ICPI was terminated due to disease progression, whereas treatment was terminated in 1 (4%) patient due to a grade 2 irAE (drug induced alveolitis).
- Subsequently, 13 (54%) and 11 (46%) patients received pembrolizumab and nivolumab respectively. Of the 24 patients, 5 (21%) patients achieved partial response, 6 (25%) patients had stable disease and 12 (50%) patients experienced disease progression. In 1 (4%) patient, best response could not be evaluated due to early death.
- A total of 33 irAEs were reported, of which 2 (6%) (interstitial pneumonitis) were grade ≥3 in severity. The most frequently reported irAE of any grade was dermatitis (n=11; 33%), followed by interstitial pneumonitis (n=8; 24%), and diarrhea (n= 7; 21%). No irAE related mortality or treatment discontinuation was reported.

Conclusion

Re-challenging patients with PD-1/PD-L1 ICPI appears to be a safe and viable option in patients with NSCLC. Larger studies in the form of randomized clinical trials are needed to establish efficacy and safety further.

References

Catheter Ablation versus Medical Therapy for the Treatment of Atrial Fibrillation in Patients with HFrEF: An Updated Meta-analysis

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University of Nevada Reno School of Medicine, Reno, Nevada
For Questions: rdoshi@med.unr.edu

**BACKGROUND**

- Current practice guidelines recommend the use of pharmacological rate and/or rhythm control for the treatment of atrial fibrillation (AF) in patients with heart failure with reduced ejection fraction (HFrEF).
- A recent randomized control trial (RCT) has challenged the norm by demonstrating an improvement in survival in these patients when treated with catheter ablation (CA).

**METHODS**

- A comprehensive literature search using the SCOPUS database was performed.
- After examining 410 relevant studies, six RCTs comparing CA with medical therapy (MT) for AF in patients with HFrEF were included.
- 4 RCTs with Catheter ablation with pharmacological rate control and 2 RCTs with rate/rhythm control.
- Quality of studies assessed using Jadad score. Heterogeneity were studied using I² statistic.
- Statistical reliability determined by Trial sequential analysis using Lan-DeMets trial sequential boundaries to assess benefit for the primary outcome
- Primary end point: All-cause Mortality.
- Secondary end point: Change in left ventricular ejection fraction (compared using standardized mean difference (SMD) with 95% confidence intervals (CI)).
- Random effects modeling was used to report risk ratio (RR) and standardized mean difference (SMD) with 95% confidence intervals (CI).
- Analysis was performed using RevMan 5.0 and R 3.4.1.

**RESULTS**

- The CA arm had significantly lower all-cause mortality as compared with MT.
- We observed a significant change in LVEF in patients undergoing CA versus medical rate control and a modest change in patients undergoing CA versus medical rate and/or rhythm control.
- Cumulative Z-curve crossed both the statistical and prespecified Lan-demets boundaries for detecting true benefit lending additional statistical reliability to our analysis.

CA led to reduction in all-cause mortality and improvement in LVEF in patients with AF and HFrEF.
Recent evidence from the CASTLE-AF trial and the results from our updated meta-analysis suggest a paradigm shift is needed for the management of AF with HFrEF.
The current practice guidelines may need to be updated to reflect the “strength” of the new evidence and future studies are needed to replicate these findings and to elucidate the pathophysiologic basis of the benefits of CA observed in this analysis.
Immune reconstitution inflammatory syndrome associated hospitalization in the United States

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Montefiore New Rochelle Hospital, Albert Einstein College of Medicine, New Rochelle, New York

INTRODUCTION

- Immune reconstitution inflammatory syndrome (IRIS) represents a spectrum of inflammatory disorders, associated with paradoxical worsening of preexisting infectious processes, after initiation of antiretroviral therapy (ART) in HIV-infected individuals.
- Epidemiological data for IRIS in the United States is lacking. With the addition of specific diagnostic code for IRIS it was made possible to better understand epidemiological specifics of the syndrome.
- The objective of the study is to describe the epidemiology of IRIS related hospital admissions in the United States.

METHODS

- We conducted a descriptive, retrospective study on the National Inpatient Sample (NIS) databases for the year 2016.
- Admissions with HIV and IRIS were selected based on International Classification of Diseases-Tenth Revision, Clinical Modification diagnosis codes (B20 and D893 respectively). Complex survey design, weights, and clustering were accounted for during analysis.
- Multivariate regression analysis was performed to determine the relationship of mortality and length of hospitalization with IRIS in HIV patients.

RESULTS

The incidence of IRIS related hospitalization is 13.2 per million admissions and the mean age of patients is 43.92 ± 14.67 years. IRIS related admissions were significantly more common in males [OR 4.56, CI (2.83-7.35), p<0.001]. IRIS accounts for 0.25% of HIV related admissions. In HIV patients, mycobacterium avium-intracellulare (16.39%), cytomegalovirus (16.39%), pneumocystis pneumonia (PCP) (13.11%), progressive multifocal leukoencephalopathy (11.48%), cryptococcal infection (9.84%) and Hepatitis B (9.84%) are the most common infectious conditions associated with IRIS. Among HIV admissions with concomitant IRIS, the adjusted odds of mortality is significantly higher [OR 3.14, CI (1.21-8.14), p<0.019] when compared to HIV patients without IRIS. The difference in mortality is mainly due to significantly higher odds of mortality in HIV patients with concurrent PCP infection and IRIS [OR 32.74, (CI 4.47-239.76), p<0.001]. The length of hospitalization is 8.49 days longer for HIV patients with IRIS when compared to HIV patients without IRIS [CI (3.8-13.18), p<0.001].

<table>
<thead>
<tr>
<th>Patient characteristics</th>
<th>Odds ratio</th>
<th>CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>0.29</td>
<td>0.14-0.64</td>
<td>0.002</td>
</tr>
<tr>
<td>History of smoking</td>
<td>0.60</td>
<td>0.36-1.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Underlying infection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAC-TB</td>
<td>16.09</td>
<td>7.13-36.29</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>JC virus (PML)</td>
<td>28.35</td>
<td>9.07-88.57</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Cryptococcus spp.</td>
<td>5.14</td>
<td>1.88-14.07</td>
<td>0.001</td>
</tr>
<tr>
<td>Hepatitis C virus</td>
<td>0.13</td>
<td>0.02-1.03</td>
<td>0.053</td>
</tr>
<tr>
<td>Herpes zoster virus</td>
<td>6.84</td>
<td>2.29-20.33</td>
<td>0.001</td>
</tr>
<tr>
<td>CMV</td>
<td>5.43</td>
<td>2.33-12.66</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Human herpes virus - 8</td>
<td>3.95</td>
<td>1.04-14.98</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Table 1: Risk and protective factors of developing IRIS in HIV patients

CONCLUSION

- IRIS related hospitalization although rare, is a syndrome that increases the odds of mortality and length of hospitalization in the HIV patients.
- PCP associated IRIS is the most fatal among HIV patients. The data from IRIS hospital admissions will increase in the upcoming years and will give us the opportunity to assess trends and specifics of the disease.
INTRODUCTION
Among primary care offices in the United States, no-show rates vary widely from 5% to 55%.1 Patients cite many reasons for not attending appointments.1-4 However, few studies have looked at the barriers of attendance among patients of a residency clinic.

OBJECTIVE
Identify barriers to attending primary care appointments among adult patients who no-showed at an urban internal medicine residency clinic.

METHODS
- 9-item closed-ended telephone survey
  - Focused on barriers related to money, transportation, and scheduling
  - Completed by trained research assistants over a 3-month period
- Sequential patients who “no-showed” for primary care appointments from May 29, 2018 to June 29, 2018
- Frequencies and means were used to describe patient characteristics and demographics.
- Chi-square test was used to compare characteristics of responders vs. non-responders

RESULTS
- 391 patients accounted for 422 no-show appointments
- 260 were contacted and 72 (27.7%) completed the survey
- Responders were more likely to be female, black, have Medicare, and be a patient of an attending
- Most common (54.1%) reason for no-show was forgetting
- Almost 60% of respondents did not cite any barriers to attendance
- 60% wanted a cell phone call
- 55.6% wanted a text message

CONCLUSION
- Most patients did not report experiencing barriers to attending primary care appointments
- The most common barrier was reliable and affordable transportation and receiving reminders in the desired form
- Non-responders were very different
- The next step of this project is to develop and implement interventions to improve the reminder system and work with barriers to transportation through innovative health care delivery

REFERENCES
Motivations behind Influenza Vaccination in Hispanic Patients with Influenza Infection during the 2017-2018 season.

Héctor J. Meléndez-González, MD (1), Gabriel Galíndez-De Jesus, MD (2), Noelia Baez, MD, (2), Humberto M. Guiot, MD, FAP (1), Karen G. Martinez, MD, MSc (3)
(1) Division of Infectious Diseases, University of Puerto Rico School of Medicine, (2) Department of Medicine, University of Puerto Rico School of Medicine, (3) Department of Psychiatry, University of Puerto Rico School of Medicine.

Introduction
Despite the availability of anti-viral therapy, vaccination remains a cornerstone in the prevention of influenza infection. However, vaccination rates in the United States remain low. A report by the CDC placed the influenza vaccine coverage for the last season around 37% for adults, a fall of 6.2% from last season.[1] Recently, Boey et al. published data where they describe the positive and negative factors that affect vaccination uptake among HCW in Belgium.[2] However, data on influencing factors for influenza vaccination among the Hispanic population is limited. In this study, we interviewed a group of Puerto Rican patients infected with the influenza virus during the season of 2017-2018. The participants were interviewed via telephone and motivations to undergo or to forgo vaccination were explored. We aimed to uncover the forces that drive the decision for vaccination among this population.

Methods
This study was designed as a cross-sectional study. The data was retrieved from a community hospital in the northern region of Puerto Rico. Non-pregnant adults with a positive rapid influenza test during the 2017-2018 influenza season were included in the study. A questionnaire composed of a section to assure their knowledge of the influenza infection and another on intentions and motivations for vaccination was constructed. Participants were called via telephone and after consent, they were interviewed. Clinical and demographic data was retrieved from the electronic health record.

Results
A total of 50 participants were interviewed, representing a response rate of 33.1% (50/151), and most of them were females 37/50 (74%). Most of the participants were not admitted to a ward leading to an admission rate of 18% (90%). A small proportion of the sample was vaccinated 11/50 (22%). In this group, the main motivation for vaccination was “being recommended by a physician” 51/11 (45.5%) followed by “being provided at work” 211/1 (18.2%). Those who were not covered prior to the event represent a 39/50 (78%) of the sample. The main reason for avoiding vaccination was trust issues 11/50 (22.5%), followed by unspecified reasons 10/50 (25%), and lack of time 7/50 (17.9%). In the knowledge section 45/50 (86%) answered that the virus can be spread from person-to-person, 42/50 (84%) responded that influenza can be a cause of death and 45/50 (90%) acknowledge that it can cause severe complications.

Table 1. Participant characteristics

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency (% - range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y, median (range)</td>
<td>48.1 (21-82)</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>37 (74%)</td>
</tr>
<tr>
<td>Male</td>
<td>13 (26%)</td>
</tr>
<tr>
<td>Cumulative comorbidities</td>
<td></td>
</tr>
<tr>
<td>Arterial Hypertension</td>
<td>19 (38%)</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>12 (24%)</td>
</tr>
<tr>
<td>Asthma/Chronic Obstructive Pulmonary Disease</td>
<td>11 (22%)</td>
</tr>
<tr>
<td>Smoking status</td>
<td></td>
</tr>
<tr>
<td>Active Smoker</td>
<td>10 (20%)</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>37 (74%)</td>
</tr>
<tr>
<td>BMI</td>
<td></td>
</tr>
<tr>
<td>&gt; 24.9</td>
<td>13 (26%)</td>
</tr>
<tr>
<td>25 – 29.9</td>
<td>20 (40%)</td>
</tr>
<tr>
<td>&gt; 35</td>
<td>13 (26%)</td>
</tr>
<tr>
<td>Admission status</td>
<td></td>
</tr>
<tr>
<td>Admitted</td>
<td>9 (18)</td>
</tr>
<tr>
<td>Non-admitted</td>
<td>41 (82)</td>
</tr>
</tbody>
</table>

Table 2. Motivations and hesitancy

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage (frequency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total of Intention of vaccination</td>
<td>79.5% (31/39)</td>
</tr>
<tr>
<td>Planned to receive the vaccine after infection</td>
<td>64.5% (20/31)</td>
</tr>
<tr>
<td>Planned to receive the vaccine after the event</td>
<td>58.1% (18/31)</td>
</tr>
<tr>
<td>Motivations:</td>
<td></td>
</tr>
<tr>
<td>Prevention</td>
<td>12.9% (4/31)</td>
</tr>
<tr>
<td>Recommendation by healthcare provider</td>
<td>46.2% (18/39)</td>
</tr>
<tr>
<td>Hesitation:</td>
<td></td>
</tr>
<tr>
<td>Already receive the vaccine prior to the event (not eligible for vaccination)</td>
<td>16.7% (2/18)</td>
</tr>
<tr>
<td>Do not want to be vaccinated</td>
<td>83.3% (15/18)</td>
</tr>
<tr>
<td>Prior vaccination</td>
<td>6.7% (1/15)</td>
</tr>
<tr>
<td>No prior vaccination</td>
<td>93.3% (14/15)</td>
</tr>
<tr>
<td>Trust and safety issues</td>
<td>73.3% (11/15)</td>
</tr>
</tbody>
</table>

Table 3. Vaccination and intention post-infection

<table>
<thead>
<tr>
<th>Category</th>
<th>Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-vaccinated participants prior to the event</td>
<td>“I don’t trust vaccines.”</td>
</tr>
<tr>
<td>Vaccinated participants prior to the event</td>
<td>“A friend got the symptoms after vaccination.”</td>
</tr>
<tr>
<td>Non-vaccinated and unwilling to undergo vaccination after the event</td>
<td>“It is recommended by my physician every year”</td>
</tr>
<tr>
<td>Non-vaccinated and willing to receive the vaccine after the event</td>
<td>“People get sick after vaccination. I have no time in case of side effects.”</td>
</tr>
<tr>
<td>Non-vaccinated and willing to receive the vaccine after the event</td>
<td>“To avoid another infection, and to avoid a strong infection”</td>
</tr>
</tbody>
</table>

Conclusion

• Trust issues regarding the influenza vaccine seem to be an important factor to forgo vaccination.
• Accessibility of the vaccine in the work setting and a recommendation by a physician seems to be a positive factor that motivates vaccination.
• Despite being well aware that this infection can be a cause of death and of severe complications the vaccination rate was low.
• Vaccination rate was lower than the average in the United States.
• This information can help the shape of further vaccination campaigns.

For more information contact: Héctor J. Meléndez-González, MD, hjmelendez@gmail.com, hector.melendez1@upr.edu

References
The Impact of Benralizumab on Asthma Control, Quality of Life, and Lung Function in Patients with Poorly Controlled, Eosinophilic Asthma: A Systematic Review and Meta-analysis

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Background
Benralizumab is a monoclonal antibody to the alpha subunit of the IL-5 receptor used in the management of severe, eosinophilic asthma. The purpose of this meta-analysis is to analyze the combined effect of Benralizumab on Asthma Control Questionnaire (ACQ) scores, Asthma Quality of Life Questionnaire (AQLQ) scores, and pre-bronchodilator (pre-BD) FEV1 values in severe asthmatics with eosinophilia.

Methods
Randomized, phase 3 placebo-controlled RCTs which compared the impact of Benralizumab on ACQ scores, AQLQ scores, and pre-BD FEV1 values in severe asthmatics with eosinophilia were included. Random-effect models were produced to compare the combined effect of Benralizumab treatment in comparison to placebo.

Limitations
There was some variability in patient populations. The duration of treatment also varied slightly between the studies, ranging from 12 to 56 weeks. We were also unable to compare outcomes between patients taking at least 1000µg of fluticasone propionate (or the equivalent) to those on a lower dose of ICS.

Results

Figure 3. Impact of Benralizumab on ACQ6 Scores

Figure 4. Impact of Benralizumab on AQLQ Scores

Figure 5. Impact of Benralizumab on pre-BD FEV1

Conclusions
Our meta-analysis demonstrates that treatment with Benralizumab as add on therapy in patients with poorly controlled, eosinophilic asthma significantly improves asthma control, asthma-related quality of life, and lung function. We have also published a second systematic review and meta-analysis which showed that Benralizumab had few adverse side effects and led to a significant reduction in annual exacerbation rates. The combination of findings from these two meta-analyses can further support recommendations for the use of Benralizumab in poorly controlled asthmatic patients with eosinophilia and help direct current treatment guidelines.

Acknowledgments
We would like to acknowledge Jordan Pike, librarian through Eastern Health, who was involved in the database search. Sarah Mallay, as part of her BSc program, completed the article selection, data extraction and statistical analysis.

Figure 1. Action of Benralizumab

Figure 2. Study Selection
Survival After Liver Transplantation for Alcoholic Cirrhosis with or without Chronic Hepatitis C Infection

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2. Division of Gastroenterology and Hepatology, Mayo Clinic, Rochester, MN
3. Division of Gastroenterology and Hepatology, Mayo Clinic, Jacksonville, FL

Background

- Liver transplantation (LT) is a life-saving intervention for end-stage liver disease due to alcoholic cirrhosis (AC)
- Several published studies have demonstrated favorable survival outcomes following LT for AC
- Outcome data following LT for AC patients with coexistent chronic hepatitis C infection is limited and mixed

Objectives

- To evaluate survival in AC patients with chronic hepatitis C infection after liver transplantation

Results

Liver transplantation in patients with AC and chronic hepatitis C infection have comparable survival to those who underwent LT for AC alone.

Patients with AC benefit from liver transplantation regardless of hepatitis C status.

Conclusion

- Liver transplantation in patients with AC and chronic hepatitis C infection have comparable survival to those who underwent LT for AC alone.
- Patients with AC benefit from liver transplantation regardless of hepatitis C status.

References


Methods

- We retrospectively reviewed 2091 recipients of deceased-donor liver transplantation at an academic transplant center from January 2000 to December 2012
- We included recipients of primary whole liver alone transplants and those with coexistent chronic hepatitis C infection and alcoholic cirrhosis
- Recipients of prior transplants, multi-organ transplants and cholangiocarcinoma cases were excluded
- 455 liver transplant recipients met the inclusion criteria

Results (Survival)

<table>
<thead>
<tr>
<th>Survival</th>
<th>Alcohol Cirrhosis</th>
<th>HCV+Alcoholic Cirrhosis</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median overall survival in years (lower and upper 95%)</td>
<td>4.1 (31%-62%)</td>
<td>3.9 (19%-55%)</td>
<td>0.5</td>
</tr>
<tr>
<td>5 year survival</td>
<td>41%</td>
<td>36%</td>
<td></td>
</tr>
<tr>
<td>3 year survival</td>
<td>58%</td>
<td>54%</td>
<td></td>
</tr>
</tbody>
</table>

Results (continued)

<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Alcohol Cirrhosis (N=302)</th>
<th>HCV+Alcoholic Cirrhosis (N=455)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in years, (mean; SD)</td>
<td>51 (19)</td>
<td>43 (15)</td>
<td>0.3</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N (% men)</td>
<td>254 (84)</td>
<td>190 (42)</td>
<td>0.04</td>
</tr>
<tr>
<td>N (% women)</td>
<td>48 (79)</td>
<td>143 (22)</td>
<td>0.04</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White, N (%)</td>
<td>214 (71)</td>
<td>140 (27)</td>
<td>0.02</td>
</tr>
<tr>
<td>Black, N (%)</td>
<td>42 (14)</td>
<td>31 (7)</td>
<td>0.02</td>
</tr>
<tr>
<td>Hispanic, N (%)</td>
<td>38 (13)</td>
<td>19 (4)</td>
<td>0.02</td>
</tr>
<tr>
<td>Indian subcontinent, N (%)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0.02</td>
</tr>
<tr>
<td>Middle Eastern, N (%)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0.02</td>
</tr>
<tr>
<td>Oceania, N (%)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0.02</td>
</tr>
<tr>
<td>American Indian, N (%)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0.02</td>
</tr>
<tr>
<td>Others, N (%)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0.02</td>
</tr>
<tr>
<td>History of HCC, n (%)</td>
<td>51 (56)</td>
<td>40 (44)</td>
<td>0.01</td>
</tr>
<tr>
<td>MELD score, median (range)</td>
<td>18 (6-51)</td>
<td>17 (6-51)</td>
<td>0.06</td>
</tr>
<tr>
<td>Donor BMI, median (range)</td>
<td>27 (12-63)</td>
<td>26 (16-65)</td>
<td>0.8</td>
</tr>
<tr>
<td>Donor age in years (mean; SD)</td>
<td>50 (20)</td>
<td>45 (16)</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Footnotes

- Long-Rank, P-value=0.5

Kaplan-Meier survival analysis was performed comparing LT recipients in two groups: AC with and without chronic hepatitis C infection.

Fig 1: Kaplan-Meier patient survival between alcoholic cirrhosis patients with and without hepatitis C after LT.
Self-Reported Global and Domain-Specific Cognitive Dysfunction (CD) in Older Adults with Newly-Diagnosed Gastrointestinal (GI) Malignancies—results from the Cancer and Ageing Resilience Evaluation (CARE) Study

Mir, Nabil, A.1; Murdaugh, Donna2; Kenzik, Kelly M.2; McDonald, Andrew2; Sharafeldin, Noha1; Paluri, Ravi1; Navari, Rudolph1; Nandagopal, Lakshmin1; Young-Smith, Crystal1; Robertson Matthew1; Bhata, Smitha2; Williams, Grant, R.1,2

1 Department of Medicine, University of Alabama at Birmingham 2 Institute for Cancer Outcomes & Survivorship, University of Alabama at Birmingham

“The research reported on this poster was supported by the Frommeyer Fellowship in Investigative Medicine and start-up funds from the University of Alabama at Birmingham. The investigators retained full independence in the conduct of this research.”

Background & Hypothesis

• Cognitive dysfunction (CD) is poorly described in older adults with GI cancers.

• The purpose of this study was to quantify the prevalence and identify baseline determinants of patient-reported global and domain-specific CD in older adults with GI cancers.

Methods

• This analysis draws from the CARE Study and includes patients aged ≥60y with a diagnosis of GI malignancy.

• Patients underwent a patient-reported Geriatric Assessment (GA). CD was measured via the Patient-Reported Outcomes Measurement Information System (PROMIS®) Short Form 4a Cognitive Function survey.

• Descriptive statistics were used to examine the prevalence of global and domain-specific CD at baseline. Global and individual scores were dichotomized into normal and impaired (raw scores of 4-15; domain scores of 1-3).

• Bivariate associations between demographic, clinical, and GA domains and potential predictors of global and domain-specific CD were identified.

Results

Table 1. Patient Characteristics

<table>
<thead>
<tr>
<th>Total Patients</th>
<th>N= 185</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean ± SD</td>
<td>70±7.20</td>
</tr>
<tr>
<td>Sex, n (%)</td>
<td>Male 111 (60.0)</td>
</tr>
<tr>
<td>Race, n (%)</td>
<td>White 143 (77.3)</td>
</tr>
<tr>
<td>Black or other</td>
<td>42 (22.7)</td>
</tr>
</tbody>
</table>

Table 2. Indicators of Global Cognitive Dysfunction

<table>
<thead>
<tr>
<th>Domains</th>
<th>Dichotomized CD (normal vs impaired)</th>
<th>Relative Risk</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>12.2% vs 55.1%</td>
<td>6.8 [3.9-12.1]</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Hearing Impairment</td>
<td>23.0% vs 60.5%</td>
<td>3.3 [1.9-5.5]</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>ADL Impairment</td>
<td>24.7% vs 60.4%</td>
<td>3.3 [1.8-5.9]</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Anxiety</td>
<td>14.1% vs 75.5%</td>
<td>2.7 [2.0-3.7]</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>ECOG PS≥2</td>
<td>20.0% vs 55.4%</td>
<td>2.7 [1.8-4.1]</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Visual Impairment</td>
<td>25.2% vs 55.2%</td>
<td>2.6 [1.5-4.5]</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Lack of social support</td>
<td>25.0% vs 55.2%</td>
<td>2.5 [1.5-4.1]</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>≥3 Fall/simo</td>
<td>27.3% vs 48.6%</td>
<td>2.0 [1.3-3.7]</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>ADL Impairment</td>
<td>16.1% vs 44.1%</td>
<td>1.7 [1.3-2.2]</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Cannot walk one block</td>
<td>19.0% vs 42.9%</td>
<td>1.6 [1.3-2.2]</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Nutritional issue</td>
<td>6.8% vs 38.6%</td>
<td>1.4 [1.2-1.7]</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>≥3 Comorbidities</td>
<td>22.1% vs 32.9%</td>
<td>1.4 [1.1-1.7]</td>
<td>0.02</td>
</tr>
<tr>
<td>≥4 Medications</td>
<td>18.2% vs 34.6%</td>
<td>1.2 [1.0-1.4]</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Table 3. Indicators of Domain-specific CD

<table>
<thead>
<tr>
<th>Domains</th>
<th>Processing speed</th>
<th>Working Memory</th>
<th>Executive Function</th>
<th>Overall Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>6.1 (3.5-10.8)</td>
<td>5.0 (3.0-8.3)</td>
<td>4.4 (2.8-7.1)</td>
<td>5.1 (3.1-4.5)</td>
</tr>
<tr>
<td>Hearing Impairment</td>
<td>1.8 (5.2)</td>
<td>1.5 (4.0)</td>
<td>2.0 (5.3)</td>
<td>1.6 (4.4)</td>
</tr>
<tr>
<td>ADL Impairment</td>
<td>3.1 (1.7-5.6)</td>
<td>3.0 (1.7-5.3)</td>
<td>3.8 (2.2-6.8)</td>
<td>3.0 (1.7-5.3)</td>
</tr>
<tr>
<td>≥3 Comorbidities</td>
<td>2.7 (1.9-3.7)</td>
<td>2.9 (1.9-3.5)</td>
<td>2.7 (1.8-4.1)</td>
<td>2.9 (1.7-4.4)</td>
</tr>
<tr>
<td>Visual Impairment</td>
<td>3.0 (1.7-5.1)</td>
<td>2.0 (1.1-3.3)</td>
<td>2.7 (1.2-3.4)</td>
<td>2.7 (1.6-4.6)</td>
</tr>
<tr>
<td>ADL Impairment</td>
<td>2.8 (1.7-4.7)</td>
<td>2.1 (1.0-3.0)</td>
<td>2.3 (1.3-2.2)</td>
<td>2.3 (1.4-2.8)</td>
</tr>
<tr>
<td>≥3 Fall/simo</td>
<td>1.8 (1.4-2.3)</td>
<td>1.6 (1.1-2.1)</td>
<td>1.7 (1.4-2.2)</td>
<td>1.7 (1.2-2.3)</td>
</tr>
<tr>
<td>≥3 Nutritional issue</td>
<td>1.4 (1.2-1.7)</td>
<td>1.3 (1.1-1.5)</td>
<td>1.4 (1.2-2.2)</td>
<td>1.4 (1.2-2.3)</td>
</tr>
<tr>
<td>≥3 Medications</td>
<td>1.3 (1.1-1.5)</td>
<td>1.3 (1.0-1.6)</td>
<td>1.3 (1.0-1.6)</td>
<td>1.3 (1.0-1.7)</td>
</tr>
<tr>
<td>No College Degree</td>
<td>1.2 (1.0-1.4)</td>
<td>1.3 (1.1-1.5)</td>
<td>1.4 (1.2-1.5)</td>
<td>1.4 (1.0-1.5)</td>
</tr>
</tbody>
</table>

Conclusions

• We found a high prevalence of self-endorsed CD in older adults with newly-diagnosed GI malignancies with highest impairments seen with processing, and CD was associated with several GA impairments.

• Future longitudinal assessments of cognition after patients have received chemotherapy are planned to identify reliable predictors of CD and to facilitate potential interventions.
Diagnostic Accuracy of a Smartphone-based Atrial Fibrillation Detection Algorithm

Isma Nusrat Javed MD, Nazir Ahmad MD, David Albert MD, Stavros Stavrakis MD, PhD
University of Oklahoma Health Sciences Center 1 & 4, Saint Anthony Hospital 2, Alive Cor Inc 3

BACKGROUND

- Smartphone-based single-lead ECG devices have enhanced the feasibility of diagnosis and monitoring of arrhythmias, including atrial fibrillation (AF).
- The Kardia mobile ECG device is an FDA-approved smartphone-based, single-lead device, with an automated algorithm to detect AF, based on RR irregularity and absence of P waves.

OBJECTIVE

- Diagnostic accuracy of the Kardia Mobile algorithm for the diagnosis of AF in patients with paroxysmal AF.

PATIENT'S CHARACTERISTICS

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>62.5±12.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>17</td>
</tr>
<tr>
<td>59%</td>
<td>Body mass index (kg/m²)</td>
</tr>
<tr>
<td>Systolic BP (mmHg)</td>
<td>120.9±12.9</td>
</tr>
<tr>
<td>Diastolic BP (mmHg)</td>
<td>72.9±8.3</td>
</tr>
<tr>
<td>Heart rate (bpm)</td>
<td>70.1±13.9</td>
</tr>
<tr>
<td>Heart failure</td>
<td>2</td>
</tr>
<tr>
<td>7%</td>
<td>Coronary disease</td>
</tr>
<tr>
<td>25%</td>
<td>Diabetes</td>
</tr>
<tr>
<td>34%</td>
<td>Sleep Apnea</td>
</tr>
<tr>
<td>14%</td>
<td>Hypertension</td>
</tr>
<tr>
<td>90%</td>
<td></td>
</tr>
</tbody>
</table>

CHA2DS2-VASc Score

| Mean (±SD) | 2.5±1.2 |
| 0-1        | 7        |
| 24%        |
| 2           | 9        |
| 31%        |
| ≥3          | 13       |
| 45%        |

HAS-BLED Score

| Mean (±SD) | 1.9±0.9 |
| 0-2        | 21       |
| 72%        |
| ≥3          | 8        |
| 28%        |

Creatinine (mg/dL) | 1.2±0.8 |
| Hemoglobin (g/dL) | 13.3±1.9 |

METHODS

- Twenty nine patients with paroxysmal AF and low CHADS2-VASc score were instructed to transmit a 30-second ECG every day and when experiencing symptoms for a median period of 20 months.
- The ECGs were transmitted to a secure server and the diagnosis was manually confirmed by 2 physicians.
- The sensitivity and specificity of the automated algorithm for the diagnosis of AF were compared against the physician interpretation as the gold standard.

RESULTS

- Over a median follow up of 20 months, 20 patients failed to submit a daily ECG at least once (median 3 failed submissions).
- A total of 14,998 ECGs were recorded. AF was diagnosed in 715 (5%) ECGs, while 1549 (10%) were deemed undetermined by the device.
- Overall, the kappa coefficient of agreement was 0.89 (95% confidence intervals 0.86 to 0.91; p<0.0001), indicating excellent agreement between the 2 methods.
- The device had a 99% sensitivity and 98% specificity for diagnosing AF (Table 1).
- When the undetermined ECGs were treated as possible AF in the analysis, the specificity dropped to 88%, while the sensitivity was maintained at 99%.

CONCLUSIONS

- The Kardia mobile ECG device provides excellent diagnostic accuracy in diagnosing AF, supporting the notion that such a device can be used for AF screening.
- In this setting, a high sensitivity in diagnosing AF will allow physicians to review only those recordings that are classified by the device as AF, in order to decrease the burden of having to review every transmitted ECG recording.
- The diagnostic accuracy of this single lead ECG device is critically dependent on high-quality signals. Thus, efforts should be directed towards patient education to acquire high-quality signals to optimize the performance of the device.

Table 1: Sensitivity and specificity of Kardia AF algorithm against physician interpretation as the gold standard

<table>
<thead>
<tr>
<th></th>
<th>AF KARDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>699</td>
</tr>
<tr>
<td>No</td>
<td>143</td>
</tr>
<tr>
<td>Total</td>
<td>842</td>
</tr>
</tbody>
</table>

Table 2: Sensitivity and specificity of Kardia AF algorithm against physician interpretation as the gold standard, when the undetermined ECGs were treated as AF in the analysis

<table>
<thead>
<tr>
<th></th>
<th>AF KARDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>709</td>
</tr>
<tr>
<td>No</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>715</td>
</tr>
</tbody>
</table>
The survival of cancer patients is increasing owing to early detection but also due to improvements in antineoplastic therapies. As such, it is estimated that by 2026 there will be more than 20 million cancer survivors. Unfortunately, these advances have led to a 25% risk of cardiovascular mortality among this population since both entities share similar risk factors in addition to the fact that antineoplastic agents are fraught with significant cardiotoxic potential. As cardiovascular disease is a major cause of death among cancer survivors, developing countries are not exempt from the high prevalence of both pathologies. Limited data exists on local practices aimed at monitoring of cardiotoxicity in this population nor are there systematically applied protocols designed at prevention during and after antineoplastic therapy. We sought to determine cardio-oncological practice patterns and cardiovascular profiles of patients on antineoplastic therapy in the Dominican Republic through the creation of a registry.

A single institution registry of cancer patients over 18 years of age referred by their oncologist to the highest-volume echo lab in the country pre-chemo or on chemo were included for analysis of demographical, clinical, biomarkers and echocardiographic profiles. Investigators were not involved in their initial care, treating oncologists received no instructions. Referral and follow-up patterns where also measured. A Microsoft Office Excel program data sheet was created for analysis and recording. Data collection included: Left ventricle ejection fraction (EF), Global Longitudinal Strain (GLS), Brain Natriuretic Peptide and Tropinin levels; presence of obesity (Body Mass Index > 30), hypertension, diabetes, dyslipidemia, tobacco use, previously known coronary artery disease, type of cancer and anti-neoplastic treatment.

RESULTS
From September 2016 to September 2018, 471 echocardiograms were performed in 309 patients: 72% were baseline studies and 28% (n=88) follow-up patients at mean 3-months. A total of 232 (75%) women, mean age 54 (18-85) years, 72% internally referred within our center. The most prevalent cancers were breast (59%), colon (7%) and lung (6%) treated with taxanes (22%) anthracyclines (19%) and trastuzumab (9%). Overall prevalence of cardiovascular risk factors was 71%, hypertension being the most common (68%) (Figure 1). The mean baseline EF was 64% and GLS -19%. Cardiotoxicity was diagnosed in 11% (n=35) of follow-up patients with Δ baseline vs follow-up EF 59% (p = 0.0001) and Δ GLS -16% (p = 0.0162) (Figure 2). Among patients with cardiotoxicity 72% (n=25) had at least one cardiovascular risk factor, being hypertension the most prevalent (51% n=18). Overall survival was 97%. Only 13% of the cohort (n=309) had cardiac biomarkers measured.

CONCLUSION
In this cohort, recently diagnosed cancer patients had a high prevalence of cardiovascular risk factors and a suboptimal pattern of monitoring. There is a need to create initiatives aimed at improving adherence to guidelines in developing nations.

REFERENCES
Introduction and Background

- Migraine is the world’s third most common disease and second most prevalent primary headache disorder (estimated global prevalence of ~18%).
- Chronic migraine is defined as ≥15 headache days per month for at least 3 months of which at least 8 are migraines and has an estimated global prevalence of ~2% (WHO).
- Efficacious treatments with high quality of evidence have been scarce and side effect-laden.
- Monoclonal antibodies that bind potently and selectively to calcitonin-gene related peptide (CGRPmAb) offer an exciting and novel drug modality for episodic migraine with a minimal side effect profile but are yet to be validated for preventive treatment of chronic migraine.

Methods

- PubMed through Oct 2018: Various iterations of keyword and MeSH term searches including “CGRP”, “monoclonal antibodies”, and “chronic migraine” were performed.
- Selected studies investigated specific CGRP monoclonal antibodies vs. placebo in the chronic migraine population for a 12 week time period and reported on >50% reduction in average monthly headache days as a primary or secondary outcome.

Results

- Three high quality RCTs evaluating fremanezumab and erenumab CGRPmAb in 2,038 subjects were included
- Treatment group: 1297 subjects [647 high dose ; 650 low dose]
- Control group: 741 subjects

<table>
<thead>
<tr>
<th>Study</th>
<th>CGRP Events</th>
<th>Placebo Events</th>
<th>Risk Ratio</th>
<th>RR 95%-CI</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bigal (Fremazumab 900 mg monthly), 2015</td>
<td>47 85</td>
<td>28 89</td>
<td>1.76 [1.22;2.52]</td>
<td>10.4%</td>
<td></td>
</tr>
<tr>
<td>Tepper (Erenumab 140 mg), 2017</td>
<td>77 187</td>
<td>66 281</td>
<td>1.75 [1.34;2.30]</td>
<td>18.3%</td>
<td></td>
</tr>
<tr>
<td>Silberstein (Fremazumab 675/225 mg), 2017</td>
<td>153 375</td>
<td>67 371</td>
<td>2.08 [1.76;2.49]</td>
<td>21.9%</td>
<td></td>
</tr>
<tr>
<td>Lower dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bigal (Fremazumab 675/225 mg), 2015</td>
<td>46 87</td>
<td>28 89</td>
<td>1.68 [1.17;2.42]</td>
<td>10.2%</td>
<td></td>
</tr>
<tr>
<td>Tepper (Erenumab 70 mg), 2017</td>
<td>75 188</td>
<td>66 281</td>
<td>1.70 [1.29;2.23]</td>
<td>18.0%</td>
<td></td>
</tr>
</tbody>
</table>

Fig 1: Forest plot demonstrating no statistically significant difference in attaining >50% reduction in average monthly headache days between higher vs. lower CGRPmAb dose in the preventive treatment of chronic migraine.

Conclusions

- The CGRPmAb fremanezumab and erenumab were equally efficacious in achieving >50% reduction in average monthly headache days in chronic migraine at variable doses and with similar side effect profiles to placebo.
- CGRPmAb present as a valid emerging pharmacotherapy choice for chronic migraine suffers with limited options who have either failed or not tolerated alternate treatments.
Regional Differences in Epidemiology and Outcomes of Heart Failure Admissions Across the United States

Akshay Goel1, Mayank Singhal2, Abhishek Goel3, Sabeeda Kadavath1, Hakan Paydak1, Jawahar L Mehta1

1University of Arkansas for Medical Sciences, Little Rock, Arkansas, USA; 2Cape Fear Valley Hospital, Fayetteville, North Carolina, USA; 3University College of Medical Sciences, New Delhi, India

INTRODUCTION

- Periodic surveillance of geographical variations in cardiovascular health is important to achieve the goal of reducing regional disparities in healthcare delivery.
- We aimed to study differences in the epidemiology and outcomes of heart failure admissions by geographic regions across the United States.

METHODS

- The National Inpatient Sample (NIS) database for the year 2016 was queried.
- Adult patients admitted with a principal diagnosis of heart failure were identified using validated ICD-10 codes.
- Comparisons were made between four regions - Northeast, Midwest, South and West.
- Baseline characteristics of heart failure admissions were identified.
- The main outcomes of interest were inpatient mortality, length of stay and hospital charges.
- Statistical analysis was performed using STATA.

RESULTS

A total of 807,764 hospitalizations with a principal diagnosis of heart failure were identified.

Of these, 153,233 (18.97%) were in the Northeast; 184,090 (22.79%) in the Midwest; 331,506 (41.04%) were in the South; and 138,935 (17.20%) in the West.

Baseline characteristics of these admissions and the outcomes of interest are shown in the table.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Northeast (n=153,233)</th>
<th>Midwest (n=184,090)</th>
<th>South (n=331,506)</th>
<th>West (n=138,935)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age (years)</td>
<td>74.27 ± 0.21</td>
<td>73.03 ± 0.21</td>
<td>70.45 ± 0.15</td>
<td>70.78 ± 0.23</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>50.39%</td>
<td>49.60%</td>
<td>51.36%</td>
<td>54.51%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Female</td>
<td>49.61%</td>
<td>50.40%</td>
<td>48.64%</td>
<td>45.49%</td>
<td></td>
</tr>
<tr>
<td>Race:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Caucasian</td>
<td>72.29%</td>
<td>78.07%</td>
<td>63.51%</td>
<td>61.38%</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>15.57%</td>
<td>17.17%</td>
<td>26.02%</td>
<td>10.78%</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>6.50%</td>
<td>2.36%</td>
<td>7.54%</td>
<td>16.94%</td>
<td></td>
</tr>
<tr>
<td>Primary payer:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Medicare</td>
<td>77.6%</td>
<td>78.4%</td>
<td>71.7%</td>
<td>67.8%</td>
<td></td>
</tr>
<tr>
<td>Medicaid</td>
<td>9.7%</td>
<td>8.3%</td>
<td>8.5%</td>
<td>17.9%</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>10.4%</td>
<td>9.9%</td>
<td>12.7%</td>
<td>11.3%</td>
<td></td>
</tr>
<tr>
<td>Self-pay</td>
<td>1.1%</td>
<td>1.3%</td>
<td>4.5%</td>
<td>1.3%</td>
<td></td>
</tr>
<tr>
<td>Hospital bedsize:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>26.3%</td>
<td>25.1%</td>
<td>18.3%</td>
<td>15.0%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Medium</td>
<td>31.6%</td>
<td>21.6%</td>
<td>32.7%</td>
<td>28.1%</td>
<td></td>
</tr>
<tr>
<td>Large</td>
<td>42.1%</td>
<td>53.3%</td>
<td>49.0%</td>
<td>56.9%</td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>10.3%</td>
<td>14.2%</td>
<td>15.0%</td>
<td>15.1%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hypertension</td>
<td>81.1%</td>
<td>83.0%</td>
<td>83.5%</td>
<td>79.3%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Diabetes</td>
<td>45.8%</td>
<td>46.4%</td>
<td>47.1%</td>
<td>44.7%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>54.4%</td>
<td>54.9%</td>
<td>53.2%</td>
<td>46.7%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mortality</td>
<td>2.93%</td>
<td>2.71%</td>
<td>2.66%</td>
<td>3%</td>
<td>0.03</td>
</tr>
<tr>
<td>Length of stay (days)</td>
<td>5.66 ± 0.09</td>
<td>4.94 ± 0.06</td>
<td>5.29 ± 0.05</td>
<td>4.91 ± 0.07</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Hospital charges ($)</td>
<td>52,289 ± 2,364</td>
<td>37,070 ± 1,188</td>
<td>44,886 ± 1,051</td>
<td>64,901 ± 2,524</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

CONCLUSION

- Our study demonstrates the existence of regional differences in the costs and outcomes of healthcare delivery to heart failure patients. Further research is needed to explore the reasons for these differences.

REFERENCES


Disclosures: None
Introduction

The mortality rate of septic shock is more than 50% in the ICU settings, recent studies showed patients with septic shock who required high-dose of vasopressors (i.e.: norepinephrine ≥0.7 μg/kg/min) had an increased mortality and decreased survival rate [1].

Up to our knowledge, there is no study to correlate the mortality rate to the number of vasopressors required to maintain mean arterial blood pressure more than 65mmhg.

Methods

Retrospective data analysis of 131 patients with median age of 68 years, M:F ratio of 61:70, who were admitted to the ICU with diagnosis of septic shock between the periods July 2015 and June 2017 in a community-based medical center.

Patients’ baseline characteristics including age, gender and comorbidities were collected along with number of vasopressors used for more than one hour at any point during the ICU stay regardless of the dose.

During this period time, ICU was under two models; open and closed models equally.

Primary outcome was death at 10, 30 and 90 days.

Patients made comfort care only were excluded from mortality rate in the study.

Linear regression analysis was performed between the number of vasopressor used and the mortality rate, P value of <0.01 was considered statistically significant.

Results

There was significant correlation between number of vasopressors required and mortality rate in both models of ICU.

Patients requiring one vasopressor, mortality rates were 16% in the first 10 days, 18% in the first 30 days and 20% in the first 90 days.

Patients requiring two vasopressors, mortality rates were 38% in the first 10 days, 50% in the first 30 days and 55% in the first 90 days.

Patients requiring three vasopressors, mortality rates were 60% in the first 10 days, 82% in the first 30 days and 86% in the first 90 days.

Patients requiring four vasopressors, mortality rates were 83% in the first 10 days, 95% in the first 30 and 96% in the first 90 days.

Patients requiring 5 vasopressors, mortality rates were 92% in the first 10 days and 100% in the first 30 and 90 days. P value was <0.01 in all of our mortality rates mentioned.

Conclusions

Our study suggests that patients with septic shock in the ICU, mortality rate can be predicted by the number of vasopressors required to maintain mean blood pressure more than 65mmhg.

This helps in goals of care discussion with patients and their families.

Patients requiring four vasopressors mortality rate is approximately 95% within 30 days.

References

Background

- Warfarin was approved for use in the 1950’s and has been the standard of care treatment for atrial fibrillation (AF) and venous thromboembolism (VTE) since this time.
- Optimal anticoagulation with warfarin is challenging:
  - Multiple drug-drug interactions
  - Food-drug interactions
  - Genetic variability
  - Narrow therapeutic index
- Warfarin requires intense outpatient monitoring and dose adjustment to maintain therapeutic drug levels.
- High risk warfarin use; as defined by a time in therapeutic range (TTR) of less than 65% is associated with increases in:
  - Stroke
  - Systemic embolization
  - Major bleeding
  - Mortality
- Direct oral anticoagulants (DOACs):
  - Have been shown to be a cost effective alternative to warfarin.
  - Greater reduction in rates of stroke and systemic embolization for the treatment of non-valvular atrial fibrillation.
  - Associated with decreased rates of major bleeding in treatment of VTE.
  - Recommended as first line therapy for treatment of VTE and non-valvular atrial fibrillation by major national guidelines.
- Previous ‘real world’ cost data suggests that a switch from warfarin to apixaban results in an estimated total medical cost avoidances of $4440 per patient-year.

Methods

- Inclusion criteria:
  - Patients enrolled in Walter Reed warfarin clinic 18 years of age or older
  - Being treated for non-valvular atrial fibrillation or VTE with a TTR < 65%
- Exclusion criteria:
  - Mechanical heart valve
  - Cancer associated VTE
  - CKD IV or worse
  - History of VTE while taking DOAC
  - Antiphospholipid antibody syndrome
  - Usage of medication known to interact significantly with DOACs
  - Pregnancy

Results

- 74 patients were identified as having a TTR < 65%
- 32 patients had no obvious contraindication to DOAC
- 31 patients (97%) were successfully transitioned to a DOAC
- The total number of high risk patients enrolled in the warfarin clinic was reduced by 42%
- Approximately 500 telephone and face-to-face encounters with anticoagulation clinic will be averead per year
- This intervention was estimated to have produced an estimated total annual medical cost avoidance of $136,000 per year.

Conclusion

- This project demonstrates a cost saving and effective method for reducing high risk warfarin use.
- Given the expanding role of DOACs in the management of VTE and non-valvular atrial fibrillation quality initiatives similar to ours have the potential to significantly improve care and reduce health care costs.
**Introduction**

Even though the overall survival of primary breast cancer has improved significantly over the past 4 decades metastatic breast cancer (MBC) continues to be viewed as an essentially incurable entity associated with only 2.5% disease-free survival at 15 years. Despite these numbers, palliative therapies have led to modest increases in 5-year survival and better quality of life.

Notwithstanding the fact that hormonal treatment remains the mainstay of management for hormonally sensitive MBC, almost all patients will eventually need cytotoxic chemotherapy for palliation purposes. Specifically addressing cytotoxic therapy, single agent modalities have been preferred over combination regimens given the high degree of toxicity and restricted responses associated with their implementation.

In heavily pretreated patients with increasingly limited options for palliative management the focus should be on ensuring proper quality of life.

With these facts in mind the authors conducted a retrospective analysis of a highly effective and minimally toxic combination regimen used in-house for over 2 decades, prompted by in vitro studies showing up-regulation of thymidine phosphorylase by vinorelbine to improve capecitabine effectiveness.

**Methods**

The investigators retrospectively analyzed a cohort of 67 women with human epidermal growth factor receptor (HER2) negative MBC treated at a large breast cancer community practice and a local cancer center with vinorelbine 22.5mg/m² IV on day 1 and 8 combined with capecitabine 1 gram PO BID for 14 consecutive days of 21 day cycles.

Patients were treated on average with 4 lines of chemotherapy. Data on clinical outcomes and patients characteristics were collected and evaluated.

**Results**

A total of 67 patients received the combination of vinorelbine with capecitabine and 2 among the 67 had two separate exposures giving an evaluable sample size of 69.

Clinical benefit rate, defined as complete response, partial response or stable disease ≥ 6 months, was 55.07%. 4.34% had a complete response, 18.8% had a partial response and 31.9% had stable disease for more than 6 months.

Consequently, Vinocap may serve as an additional lifeline especially when used after 4 lines of chemotherapy with no reported instances of alopecia seem compelling arguments that should warrant consideration in this patient population.

The combination of Vinorelbine/Capecitabine appears to be an active and well-tolerated regimen in women with MBC.

**Images**

**Figure 1. Clinical Benefit as a function of prior line of chemotherapy**

Each color represents the type of observed response: CR (complete response) is depicted in blue, PR (partial response) in orange, and SD (stable disease for more than 6 months) in grey. Percentages on top of each stack depict the amount of clinical benefit seen with VINOCAP as a function of CR, PR and SD rates versus total in subgroup (in parentheses).

**Figure 2. Clinical benefit: Swimmer plot on duration of therapy**

Patients are arranged according to duration of treatment on VINOCAP from short (15 days) to long (53.87 months). Each color represents the type of response exhibited in each case. Dotted line represents median duration of disease.

**Results (continued)**

Median progression free survival (PFS) time was 6.2 months and overall survival 35.47 months from start of VINOCAP therapy.

The most common grade 3-4 toxicity was neutropenia in 10% of cases. Dose had to be reduced in 18% of the patients due to toxicity. The regimen was very well tolerated and side effects were rarely seen.

**Conclusions**

- A PFS of 6.2 months and clinical benefit in >50% of cases especially when used after 4 lines of chemotherapy with no reported instances of alopecia seem compelling arguments that should warrant consideration in this patient population.

**References**

The Social Determinants of Deciding Resuscitation Status in Critically Ill Patients > 70years?

Julius Musenze, DO, Christina Vu, DO. Learned Gonzales, MD

Desert Regional Medical Center, Palm Springs-CA

Background

- We anecdotally observed that some races, genders, and social economic groups, among others, would easily decide to make a sick loved one “Do Not Resuscitate (DNR)” or “Do Not Initiate (DNI)” while others opted for “Full Code” regardless of actual or perceived outcomes.

Hypothesis

- We set out to investigate whether racial identification, religion, education level, occupation, income, means by which a code decision is reached (individual vs. group), relationship of decision maker to the patient, and the age of patient or that of decision maker if not patient, influenced resuscitation status when all available information was presented to them.

Methods and Materials

- We interviewed all patients >70 years and older admitted at Desert Regional Medical Center (DRMC) on Saturday August 4, 2018.
- This “entire-hospital-on-a-single-day” approach was designed to minimize/eliminate selection and sampling biases.
- Most patients had been inpatient for 2-3 days and already had a code designation.
- This “entire-hospital-on-a-single-day” approach was designed to minimize/eliminate selection and sampling biases.

- We set out to investigate whether racial identification, religion, education level, occupation, income, means by which a code decision is reached (individual vs. group), relationship of decision maker to the patient, and the age of patient or that of decision maker if not patient, influenced resuscitation status when all available information was presented to them.

- We explained that agreeing or declining to participate in the study would not affect the level of care they received.
- Patients who knew the reason for their admission and those who didn’t both preferred “Full Code over DNR” with similar frequency.

Conclusion

- We conclude that income level (higher income=DNR), religious beliefs (Catholics=Full Code, Atheists=DNR) and education level (some education=Full Code, University Graduate=DNR) influenced a patient’s code designation when decision was made by patient vs. by Designated Power Of Attorney (DPOA).
- Religious belief (Catholics/Christians were overwhelmingly Full Code while Atheists opted for DNR)
- Age: “Some schooling/Some College” preferred Full Code over DNR (χ² = 6.842, p = .009) < .05.
- Patient’s Age did not affect choice of code status (χ² = .365, p = .947) > .05.

References


Contact Information

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Polymorphous low-grade neuroepithelial tumor of the young: A distinct biological entity with excellent surgical prognosis

Rami Diab MD, Nazih Moufarrij MD

Introduction and Background
- Polymorphous low-grade neuroepithelial tumor of the young (PLNTY) is a recently characterized subset of neuroepithelial neoplasms, of which exceedingly few cases have been reported in the literature to date.
- PLNTYs have demonstrated excellent definitive response to surgical resection, underscoring the importance of recognizing them amidst the fuller spectrum of low-grade neuroepithelial tumors.

Case Presentation
- A 15-year-old previously healthy female presented for evaluation of new onset grand mal seizures. MRI brain with and without contrast revealed a solid and cystic superficial left posterior temporal lobe mass without definitive enhancement.
- Neurosurgery was consulted and recommended surgical excision of the mass and the patient experienced full resolution of seizure activity postoperatively.
- Histopathologic analysis of the resected specimen showed extensive microcalcifications with tumor cell populations consisting of round uniform nuclei and clear cytoplasm resembling oligodendrial cells. Tumor cellularity was moderate without definite evidence of mitotic activity, microvascular proliferation, or necrosis.
- The cells appeared to have a complex phenotype showing expression of Olig2 and CD34 as well as synaptophysin suggestive of both glial and neuronal differentiation. Immunohistochemical staining for GFAP was diffusely positive, largely corresponding to an underlying pattern of reactive gliosis.
- Notably, no BRAF mutation was identified including BRAFV600E, based on the neurooncology targeted next-generation sequencing (NGS) panel.
- Finally, ATRX expression was attained in tumor cells and P53 protein was variably expressed in a moderate number of cells. In light of the above, the tumor was most histopathologically consistent with PLNTY.

Discussion
- PLNTYs are a newly characterized distinct subgroup of low-grade neuroepithelial tumors possessing infiltrative growth, oligodendroglial-like cellular components, and intense CD34 positivity.
- Surgical excision favors prompt and sustained resolution of epileptogenic activity, thereby accentuating the importance of accurate and impartial diagnosis.
A Rare Case of Retroperitoneal Dedifferentiated Liposarcoma
Maryselle Winters DO, Fuad Bashjawish DO, Dezarae Leto DO, Julian Jeberaeel MS III,
Dr. Horowitz MD, Dr. Singhal MD
Campbell University School of Osteopathic Medicine, NC.
Cape Fear Valley Medical Center, Fayetteville NC.

## Case Report

- 73 year old male presented for acute abdominal pain and was found to have a large 15cm x 15 cm abdominal mass.
- Underwent an exploratory laparotomy, radical resection of retroperitoneal tumor, left nephrectomy, and left colectomy.
- Pathology: Dedifferentiated Liposarcoma (DDLs), high-grade measuring 16cm in greatest diameter, and margins positive.
- Post-operative course was complicated by pelvic abscess formation and residual tumor burden.
- Additional surgery required for drainage of pelvic abscess, resection of transverse colon and proximal rectum, transverse colostomy with Hartman’s pouch, small bowel and further resection of sarcoma.
- Despite multiple de-bulking surgeries, his restaging neoplasm imaging studies showed residual tumor.
- Currently undergoing 3-4 cycles of adjuvant chemotherapy with repeat imaging studies for reassessment.
- Pathologic Stage Classification: pT4NX
- Tumor had weak S-100 and strong CD56 positivity suggesting MPNST.

## Introduction

- Retroperitoneal sarcomas only account for 0.1% of all malignancies.
- Liposarcomas account for 20% of all sarcomas in adults.
- Deaths result from local effects on critical adjacent organs, usually in the retroperitoneum.
- Prognostic factors:
  - Tumor grade/integrity
  - Presence of positive margins
  - Degree of resection

## Case Report

- We report a 73 year old male with a dedifferentiated retroperitoneal liposarcoma, high-grade measuring 16cm in greatest diameter, and margins positive.
- Treatment included two de-bulking surgeries and chemotherapy.

## Abstract

- Liposarcoma is the most common of all retroperitoneal sarcomas, however the dedifferentiated subtype is extremely rare.
- Retroperitoneal sarcomas only account for 2 to 5 people per million population.
- Significant prognostic factors are tumor grade, the presence of positive margins, tumor integrity, and degree of resection.
- We report a 73 year old male with a dedifferentiated retroperitoneal liposarcoma, high-grade measuring 16cm in greatest diameter, and margins positive.
- Treatment included two de-bulking surgeries and chemotherapy.

## Discussion

- Prognostic factors are tumor grade, the presence of positive margins, tumor integrity, and degree of resection.
- Achieving a complete resection and the grade of the tumor are the most important prognostic factors for a patient’s survival.
- Survival rates are inversely proportional to the grade of the tumor.
- Kidneys are the most common organ resected.
- Even with radical resection of the tumor, there is always a risk of residual tumor cells within the tumor bed that contributes to recurrence and additional surgical interventions.

## Conclusion

- Approach this disease process with a multidisciplinary team effort that includes surgical, medical, and radiation oncology.
- Further research into different treatment methods with systemic chemotherapy or novel targeted therapeutic trials may improve the outcomes of these patients.

## References

AN UNUSUAL CAUSE OF PANCREATITIS

Crystal Mancebo N’, MD; Keyla Villaˆ, MD.
‘Department of Internal Medicine, PGY2; ”Department of Gastroenterology.
CEDIMAT, Dominican Republic.

INTRODUCTION

Neoplastic transformation of the intestinal mucosa occurs more commonly near the ampulla than at any other site in the small intestine. Despite this, primary ampullary tumors are rare, with an incidence of approximately four to six cases per million population and account for only 6 percent of lesions that arise in the periampullary region but are responsible for 20 percent of all tumor-related obstructions of the common bile duct. Pancreatitis as a consequence of this lesion is even more rare and the etiological association is often underestimated.

CASE PRESENTATION

A 63-year-old Asian male was admitted to the emergency department due to abrupt episodes of intense epigastric abdominal pain radiating to the left flank and back, for 5 hours, not improving after duplicating his daily dose of antacid. Weight loss, nausea, vomiting, jaundice were not reported. Past medical history noteworthy for hypertension, benign prostatic hyperplasia and gastritis.

PHYSICAL EXAM

Physical examination revealed diffuse abdominal pain on light palpation, but it was soft and depressible. Rest of the examination was unremarkable. Laboratory studies showed lipase levels greater than 2,000 U/L, blood urea nitrogen slightly elevated, hemoctrit in 44% and leukocytosis with left deviation. A diagnosis of acute pancreatitis was made and treated as such.

DIAGNOSIS

- An abdominal CT scan\(^1\) depicted important edema of peri-pancreatic fat associated with free fluid in both parieto-coolic grooves, wall thickening at the second portion of the duodenum and nodular thickening of Vater’s ampulla.

- There was no evidence of biliary duct dilation or calculi on an abdominal sonogram or CT scan.

- Upper endoscopy\(^2\) showed a polyp in the gastric corpus and a deformed duodenal papilla with infiltrating mucosa.

- Biopsy\(^3\) revealed findings compatible with Vater’s ampulla moderate differentiated adenocarcinoma.

HOSPITAL COURSE

Patient had a torpid clinical evolution, requiring mechanical ventilation for a couple of days and parenteral nutrition support. He is currently in route to obtain surgical treatment.

DISCUSSION

In this middle-aged man with no history of alcohol use or evidence of a biliary process and negative results for an autoimmune disease, we took the chance of recognizing this Ampulloma as the cause of his acute pancreatitis.

A rare and underestimated cause of a very common disease made this case delightful and proves the relevance in pursuing the etiology of this condition without just limiting to manage the patient’s symptoms.

REFERENCES


Introduction

- Strongyloides Stercoralis is a parasitic infection endemic in many tropical countries, and is seen in the United States amongst immigrants.
- The cycle of autoinfection permits its presence for decades in its immunocompetent host with minor symptoms. However, when the host becomes immunocompromised, a disseminated disease or hyperinfection syndrome proves to be fatal.

Case Description

- A 77 year old man from Trinidad and Tobago presented with nausea, vomiting, poor appetite, abdominal pain and altered mental status for 4 days.
- He arrived to the United States two weeks prior to symptom presentation with no active health concerns.
- His family reported coffee ground emesis, melena, and a 50 lb unintentional weight loss.
- On examination, he was cachectic with marked epigastric tenderness, and decreased bowel sounds.
- His mental status deteriorated upon admission and he soon became unresponsive and hypotensive, which prompted a transfer to the intensive care unit for intubation, mechanical ventilation and vasopressor support.
- CT abdomen and pelvis revealed ischemic colitis and antibiotics were initiated for septic shock.
- Albenzole and oral ivermectin were initiated through a nasogastric tube, but given the intestinal ileus, absorption was questionable.
- An investigational new drug (IND) approval was obtained from the Food and Drug Administration (FDA) to administer veterinary subcutaneous ivermectin formulation.
- Following FDA approval, the subcutaneous formulation was administered along with oral albenzole for 10 days.
- A lumbar puncture was unrevealing, but the patient was given empiric meropenem for suspected concurrent gram-negative meningitis.
- Since the patient remained intubated for 21 days, a tracheostomy and percutaneous gastrostomy tube placement were performed.
- He was eventually weaned from ventilator and vasopressor support, and subsequently downgraded from the intensive care unit.

Discussion

- Critically ill patients infected with Strongyloides Stercoralis can develop hyperinfection syndrome, which is dangerous and challenging to treat.
- Hyperinfection syndrome is triggered by an underlying immunocompromising condition.
- The presence of concomitant intestinal malabsorption precludes the use of oral preparations.
- Gram negative meningitis is a common complication.
- Since parenteral ivermectin is not approved in humans, an unorthodox approach may be needed with a veterinary formulation of subcutaneous ivermectin. This will require FDA approval.
- Thus when dealing with a patient population at risk for Strongyloides infection, it is prudent to have different formulations of antiparasitic agents readily available.
- Internists should know about screening individuals at risk for parasites to prevent complications.

References:

**BACKGROUND**

- ST segment on the ECG marks the beginning of ventricular repolarization
- Early repolarization, described as J-point elevation in at least two contiguous leads, occurs in 1 to 14% of the general population and was previously considered benign
- Prior studies have used differing definitions for early repolarization and some have resorted to using ST elevation at the J-point as a reproducible surrogate of early repolarization
- Recent studies suggest that ST elevation at the J-point is associated with elevated risk of death
- The prognostic significance of elevation at other time points along the ST segment is not currently known

**OBJECTIVE**

- To examine the prevalence and prognostic importance of elevation at various ST points in a large multi-ethnic population

**STUDY POPULATION**

- ARIC (15,792 participants) and MESA (8,814 participants) are population-based cohort studies designed to study the predictors and natural history of cardiovascular disease

**METHODS**

- ECG Measurements:
  - All participants underwent resting 12-lead ECG at baseline using the same methods and the ECGs were read at the same reading center

**Exclusion Criteria**

- QRS ≥120 ms (1,004 participants), prevalent CHD (676 participants), ≥0.5 mV at the J-point and/or ≥0.1 mV in contiguous leads, occurs in 1 to 14% of the general population and was previously considered benign

**Statistical Analysis**

- Hazard ratios for all-cause and coronary heart disease mortality were calculated using Cox proportional hazard models
- Multivariable models were adjusted for baseline age, gender, ethnicity, source cohort, BMI, education, heart rate, hypertension, left ventricular hypertrophy, smoking status, diabetes, LHD, HLD, and aspirin and/or statin therapy
- Multiplicative and additive interaction with gender and ethnicity was checked

**RESULTS**

**Table 1. Baseline Characteristics of Patients**

<table>
<thead>
<tr>
<th>All Participants</th>
<th>ST J60 Inferior only Elevation</th>
<th>ST J60 Lateral only Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at Visit 1 (years)</td>
<td>56.1±1.85</td>
<td>55.07±1.7</td>
</tr>
<tr>
<td>Female (%)</td>
<td>56.2</td>
<td>33.3</td>
</tr>
<tr>
<td>Ethnicity (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>86.2</td>
<td>52.2</td>
</tr>
<tr>
<td>African - American</td>
<td>26.3</td>
<td>30</td>
</tr>
<tr>
<td>Hispanic</td>
<td>6.4</td>
<td>6.7</td>
</tr>
<tr>
<td>Asian</td>
<td>3.8</td>
<td>11.1</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>27.8±3.4</td>
<td>25.2±6.1</td>
</tr>
<tr>
<td>Education (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>21</td>
<td>26.7</td>
</tr>
<tr>
<td>Intermediate</td>
<td>47.9</td>
<td>36.7</td>
</tr>
<tr>
<td>Advanced</td>
<td>31.2</td>
<td>36.7</td>
</tr>
<tr>
<td>Heart rate (bpm)</td>
<td>65.4±10.1</td>
<td>63.7±11.4</td>
</tr>
<tr>
<td>Hypertension (%)</td>
<td>31.8</td>
<td>20</td>
</tr>
<tr>
<td>LVM by Cornell Criteria (%)</td>
<td>1.7</td>
<td>1.1</td>
</tr>
<tr>
<td>Smoking Status (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>45.3</td>
<td>31.1</td>
</tr>
<tr>
<td>Former</td>
<td>32.7</td>
<td>35.6</td>
</tr>
<tr>
<td>Current</td>
<td>22</td>
<td>33.3</td>
</tr>
<tr>
<td>Diabetes (%)</td>
<td>9.8</td>
<td>11.7</td>
</tr>
<tr>
<td>LVD (mg/dL)</td>
<td>130±73.8</td>
<td>123±46.5</td>
</tr>
<tr>
<td>HLD (%v)</td>
<td>51.9±66.5</td>
<td>52.3±18.2</td>
</tr>
<tr>
<td>Aspirin (%)</td>
<td>37.9</td>
<td>31.1</td>
</tr>
<tr>
<td>Statin (%)</td>
<td>46.8</td>
<td>38.3</td>
</tr>
</tbody>
</table>

**Table 2. Overlap of Participants with Inferior versus Lateral ST Elevation at Various ST Segment Points**

<table>
<thead>
<tr>
<th>InFERIOR ST Elevation</th>
<th>LATERAL ST Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>J-Point</td>
<td>Mid-ST</td>
</tr>
<tr>
<td>J-Point</td>
<td>16</td>
</tr>
<tr>
<td>Mid-ST</td>
<td>23</td>
</tr>
<tr>
<td>ST-End</td>
<td>46</td>
</tr>
</tbody>
</table>

**Table 3. Adjusted Hazard Ratios of Death, According to Elevation at Various ST Points**

<table>
<thead>
<tr>
<th>ST J60 Inferior ST Elevation</th>
<th>ST J60 Lateral ST Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>No ST Elevation (N=1396)</td>
<td>1-1.0</td>
</tr>
<tr>
<td>N=983</td>
<td>1.0</td>
</tr>
<tr>
<td>Age, Gender, Ethnicity, and</td>
<td>1.25 (1.16-1.34)</td>
</tr>
<tr>
<td>Source Cohort (Adjusted Hazard Ratio)</td>
<td>1.07 (1.00-1.15)</td>
</tr>
<tr>
<td>Asymptomatic Inferior Elevation*</td>
<td>1.00 (1.00)</td>
</tr>
</tbody>
</table>

**LIMITATIONS**

- Small event numbers in some subgroups limited testing for interactions and dose-response relationships
- Differing J-point elevation nomenclature in prior literature
- Morphologic information about QRS slurring, or notched J-waves was unavailable
- Exclusion criteria for baseline ST point elevation

**CONCLUSIONS**

- Asymptomatic inferior lead ST elevation ≥ 1mV is uncommon (0.5%) and is associated with approximately 2-fold risk of mortality regardless of ethnicity (HR 1.94, 95%CI 1.32 - 2.84)
- Inferior ST elevation at the J-point and the mid-ST accompanies the highest magnitude of risk
- Asymptomatic lateral ST elevation ≥ 1mV at the ST-end point is common (27.8%) and is associated with lower risk of mortality (HR 0.68, 95%CI 0.81 – 0.95)

**IMPLICATIONS**

- Different J-point elevation nomenclature in prior literature
- Morphologic information about QRS slurring, or notched J-waves was unavailable
- Small event numbers in some subgroups limited testing for interactions and dose-response relationships
Vertebral Artery Dissection: Hidden in Plain Sight

Shravya Vinnakota¹, MBBS, Korosh Sharain², MD
¹Department of Internal Medicine, ²Division of Cardiovascular Diseases
Mayo Clinic, Rochester, MN

Learning Objectives

- Recognize the subtle clinical signs of vertebrobasilar insufficiency
- Understand the limitations of head CT for acute ischemia
- Learn how to perform the 3-step bedside oculomotor HINTS exam

Clinical Presentation

- 57-year-old male with acute onset nausea, vomiting and vertigo for 1 hour
- 3 weeks ago, fell on ice and landed on his back → whiplash injury. Denies direct head trauma or loss of consciousness.
- Intermittent headaches, right sided neck pain x3 weeks
- PMH: Sensory seizures secondary to benign intracranial dysembryoplastic tumor, well-controlled on Levetiracetam
- Physical exam: R horizontal nystagmus, unidirectional
- Non-contrast head CT: Negative for acute pathology
- Nausea, vomiting improved with conservative measures, vertigo persisted

HINTS Exam

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Impulse Test (Test of Vestibulo-ocular reflex)</td>
<td>Impulse Normal (Vestibulo-ocular reflex intact, no ‘catch up’ saccades)</td>
</tr>
<tr>
<td>Nystagmus (Assessed with gaze testing)</td>
<td>Vertical, torsional or fast-phase alternating horizontal nystagmus</td>
</tr>
<tr>
<td>Test of Skew (Assessed with Alternate Cover Test)</td>
<td>Refixation on Cover Test (‘Catch up’ saccades in uncovered eye)</td>
</tr>
</tbody>
</table>

Discussion

- Spontaneous artery dissections are uncommon but account for 25% of strokes in the young.
- Trauma of varying degree, especially in the setting of underlying risk factors, has been linked to vertebral artery dissections.
- Consequent ischemia is more common than hemorrhage as it is thought that emboli from thrombus formation at the dissection site are the cause for the ischemic sequelae.
- CT or MRI with angiography of the head and neck is indicated.
- In the setting of ischemia, thrombolytics are indicated in the initial 3-4.5 hours.
- Antiplatelet/anticoagulant drugs are recommended for at least 6 months.
- Endovascular /surgical interventions are considered for patients with subarachnoid hemorrhage or recurrent ischemic symptoms while on antithrombotic therapy.
- Secondary preventive measures should target cardiovascular risk factors.

Clinical Pearls

- This case highlights the importance of recognizing the subtle signs of vertebrobasilar insufficiency. Headache/neck pain/focal neurological deficits can be mild or absent.
- A 3-step bedside HINTS exam is highly sensitive for detection of ischemic strokes.
- For an internist, it is crucial to consider vascular dissections in the differential for headache and vertigo in a young adult, especially with history of head or neck trauma.

INTRODUCTION

According to the Centers for Disease Control and Prevention (CDC), 30.3 million Americans are diabetic, making up 9.4% of the U.S. population. With statistics showing both incidence and prevalence of diabetes diagnoses steadily rising, medical communities must respond to this increasing healthcare burden.

Although standards of care have been long studied and published, there are continued barriers to address all quality metrics in a single patient encounter. Some specific barriers in a resident clinic include:
- Underserved, non-English community (interpreters needed)
- Resources limited (laboratory & medication costs)
- Different follow-up providers (lack of continuity)
- Time constraints (multiple problems to address)

We present a quality improvement project that targets executing and documenting diabetic standards of care in a resident clinic.

METHODS

9 standard of care metrics were chosen, including:
- Hemoglobin A1c
- Urine microalbumin
- Diabetic foot exam
- Ophthalmology exam
- Blood pressure control
- Statin
- Aspirin 81 mg (ASCVD risk > 10%)
- Hepatitis B vaccine
- Pneumococcal vaccine

Additionally, we chose to include if thorough documentation of such standards of care occurred in each patient chart as it is important for communication between providers.

Patient lists were generated under resident providers that were seen for diabetes evaluations.

<table>
<thead>
<tr>
<th>Dates</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre – intervention</td>
<td>July – Sept 2017</td>
</tr>
<tr>
<td>Post – intervention</td>
<td>April – July 2018</td>
</tr>
</tbody>
</table>

For both data sets, we eliminated duplicate, acute care, and non-relevant visits in which diabetes was not thoroughly addressed.

INTERVENTION

We created a template in Athena EMR with specific menus to address parameters for completion and documentation.

Internal Medicine residents were encouraged by faculty to use the template when addressing diabetes from April – July 2018.

Notices were placed at each computer workstation.

E-mail alerts were sent periodically to residents to increase awareness.

RESULTS

Chart reviews were completed using non-paired, one-way Z-tests of two population proportions using a p value of <0.05.

Results show statistically significant increases in execution of: yearly microalbumin, ophthalmology exam, foot exam, and PPSV23 vaccinations. A clinically relevant increase in Hepatitis B vaccinations was observed as well.

With regards to metric documentation, results show statistically significant increases in: yearly microalbumin, ophthalmology exam, foot examinations, blood pressure control and ASA.

DISCUSSION

With diabetes as the 7th leading cause of death in the U.S., immediate action must be taken to meet all the standards of care.

Results of this Quality Improvement project displays positive outcomes confirming improved execution and documentation of some quality metrics. Although our template was only used 27% of the time, we have identified barriers to resident compliance:
- Unfamiliarity – pilot project, new interns in July
- Decreased effectiveness of reminders, moving work stations
- Time constraints, language barrier
- Different resident providers/care team +/- medical student

We aim to increase template use in the future by combating such barriers. Compliance will likely increase with familiarity, and with the awareness of positive data resulting from our template. Future projects can include an automatic diabetes order set that includes this template. We hope to inspire other resident clinics to implement a comparable tool on various other electronic medical records (EMRs) to achieve similar results.

REFERENCES


Multaq and the Mysterious Effusions
A Case of Drug-Induced Lupus Secondary to Dronedarone
Ishan Gohil, MD; Lyndsey Booker MD, Cassidy Menard MD; Laura Hampton MD
St. Vincent Hospital, Indianapolis, Indiana

Introduction
Drug-Induced Lupus (DIL) is a rare systemic autoimmune condition due to autoantibody generation secondary to a provoking medication. Some features of DIL overlap with systemic lupus erythematosus (SLE), but DIL tends to have more abrupt onset, older age at onset, and spare the kidneys and central nervous system. We present a fascinating case of a patient with recurrent pleural and pericardial effusions secondary to drug-induced lupus from dronedarone.

Our Case
A 70-year-old female with distant history of chest radiation and atrial fibrillation presented to our hospital due to worsening dyspnea, effusions, weight loss, and tamponade physiology on echocardiogram. Ejection fraction was 45-50% with focal hypokinesis of the inferior and anterolateral walls. Over the past nine months, she had recurrent pleural effusions requiring multiple thoracenteses. Outpatient fluid studies demonstrated transudative effusions negative for infection, tuberculosis, or malignancy. Serum ANA titer was 1:160 on one occasion but subsequently negative on repeat testing.

Physical Exam:
General: Thin, diffuse mild muscle wasting, no acute distress
Chest: rales in bilateral lung bases
Cardiac: normal S1/S2, no M/R/G, RRR
Abdomen: soft, NT/ND, no organomegaly
Extremities: no edema
Neurologic: AAO x 3; no gross motor or sensory findings

Laboratory Data and Imaging

<table>
<thead>
<tr>
<th>Systemic Lupus</th>
<th>Drug-Induced Lupus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female to Male Ratio</td>
<td>Female predominance / Equal</td>
</tr>
<tr>
<td>Onset of symptoms</td>
<td>Slow (months to years) / Rapid (weeks to months)</td>
</tr>
<tr>
<td>Arthralgias</td>
<td>75-90% / 80 to 95%</td>
</tr>
<tr>
<td>Rash</td>
<td>50-70% / 80-85%</td>
</tr>
<tr>
<td>Pleuritis/Effusions</td>
<td>10-60% / 80-85%</td>
</tr>
<tr>
<td>Renal Involvement</td>
<td>50-100% / &lt;5%</td>
</tr>
<tr>
<td>CNS Involvement</td>
<td>25-70% / &lt;1%</td>
</tr>
<tr>
<td>Hematologic Involvement</td>
<td>Common / Rare</td>
</tr>
<tr>
<td>Anti-dsDNA</td>
<td>50-80% / &lt;1%</td>
</tr>
<tr>
<td>Anti-Smith</td>
<td>20-30% / &lt;5%</td>
</tr>
<tr>
<td>Anti-histone</td>
<td>60-80% / &lt;1%</td>
</tr>
<tr>
<td>Hyponcomplementemia</td>
<td>40-65% / &lt;1%</td>
</tr>
</tbody>
</table>

Table 1. A Comparison of the features between DIL and SLE

Take Home Points
• Dronedarone is a potential cause of DIL
• Suspect DIL with appropriate clinical history, lack of other implicating causes
• Renal and CNS findings are typically absent in DIL versus SLE
• Anti-histone antibodies are strongly correlated to DIL
• Treatment primarily entails stopping offending drug with steroid as adjunct for serious systemic disease

References:

Clinical Course
The patient underwent a pericardial window, talc pleurodesis, and pleural biopsy. Fluid studies from both the pleura and pericardium confirmed transudative effusion. Postoperative echocardiogram revealed improved ejection fraction of 50-60%, normal wall motion, and resolution of tamponade physiology. Studies from both serum and fluid including ANA, complement, ANCA, rheumatoid factor, bacterial and fungal cultures, and cytology were all within normal limits. Anti-histone antibody was strongly positive in both serum and pericardial fluid.

Figure 1a and 1b. Pre-treatment radiograph and non-contrast CT scan. Note the bilateral costophrenic blunting of radiograph (arrows) and bilateral pleural effusions and pericardial effusion on CT scan (asterisks).

Figure 2. One month post-treatment radiograph. Note the absence of bilateral pleural effusions seen in pre-treatment imaging.

Discussion
Drug-induced lupus is rare. Diagnosis is made by a thorough history and physical exam, elucidation of a provoking medication, positive serologic markers, clinical symptoms consistent with lupus, and improvement after drug cessation. Anti-histone antibodies are most strongly tied to DIL and present up to 95 percent of the time with traditionally implicated drugs. Amiodarone has been reported to cause DIL, but from our literature search, this would be the first case of dronedarone-induced lupus. Typical manifestations include arthritis, serositis and cutaneous findings. Hematologic, renal, and CNS abnormalities of SLE are very rare with DIL, consistent with our patient’s presentation. Treatment entails stopping the offending medication. Serious complications can benefit from systemic corticosteroids, which usually provides rapid initial improvement. Prognosis is typically favorable but may take weeks to months until full recovery.

Review of patient’s history revealed start of dronedarone therapy approximately 12 months prior to admission, three months before the onset of effusions. A thorough medication review demonstrated no other culprit medication. Dronedarone was stopped and rate-control started with a beta-blocker. Due to persistent output from her pericardial drain and small recurrent pleural effusion, low dose prednisone was started. She had a significant decrease in drain output within 24 hours. The drain was removed, and she was subsequently discharged with outpatient Rheumatology and Cardiology follow-up. Review of chest radiograph and echocardiogram one month later revealed complete absence of effusions.

Figure 2. One month post-treatment radiograph. Note the absence of bilateral pleural effusions seen in pre-treatment imaging.
**Aim:** To prevent the spread of communicable and other infectious diseases between patients, personnel, and visitors.

**Objectives**

- To covertly monitor the overall and individual compliance of contact precautions (CP) among HCW during routine patient care.
- To analyze and compare the compliance rates of overall and individual CP's among HCW. (hand hygiene, glove and gown)

**Methods**

- A prospective observational study in six hospitals affiliated with Detroit Medical Center (DMC)
- **Study Period** - July 2017 to February 2018
- **Observers** - Trained, multidisciplinary personnel.
- **Components recorded** - (1) HH before donning the gloves and gown, (2) proper gowning and gloving techniques upon entering the patients room, (3) doffing the gown and gloves properly after leaving the room and (4) HH after doffing.
- **Education** - to all HCW before and during the study
- **Additional Pilot Program** - Education on strict adherence of HH practice before donning gloves (one hospital)
- **Data recorded** - Speedy audit app

**Results**

- **Total Observation** - 6274 (Both Inpatient and Intensive Care units)
- **Overall Bundle Compliance**
  - HH Compliance
    - Total: 55% 55% 57% 35% 32% 18% 49%
    - HH % compliance: 20% 20% 20% 20% 20% 20% 20%
    - % COMPLIANT
      - 60% 56% 51% 46% 50% 49% 48%
      - #Opportunities: 2936 1784 82 235 879 358 6274
      - #Compliant: 1298 745 37 71 184 46 2381
      - %Compliant: 44.2% 41.8% 45.1% 30.2% 20.9% 12.8% 38.0%
      - HH Compliance
        - ﬂow 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
    - Overall Bundle Compliance Total
      - Nurse: 55% 55% 57% 35% 32% 18% 49%
      - Physici
        - an: 44% 42% 43% 30% 21% 13% 38%
      - % COMPLIANT
        - 60% 56% 51% 46% 50% 49% 48%
      - % COMPLIANT
        - 60% 56% 51% 46% 50% 49% 48%
      - #Opportunities: 2936 1784 82 235 879 358 6274
      - #Compliant: 1298 745 37 71 184 46 2381
      - %Compliant: 44.2% 41.8% 45.1% 30.2% 20.9% 12.8% 38.0%
      - HH Compliance
        - ﬂow 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
    - HH Compliance
      - ﬂow 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

**Conclusion**

- The overall compliance of CP bundle was low among all HCW.
- Low HH compliance before donning the gloves can be linked to the common misconception that gloves are a substitute to hand hygiene.
- Targeted education on adherence to HH before donning gloves improved compliance rate among HCWs.
- Mentor's practice of CP has proven to be a strong influential factor for fellow students and peers compliance.
- Recognition of the importance of these CP measures among HCW is pivotal.

**Recommended Order of Donning PPE**

HH (soap & water or Alcohol rub) -> Gown -> Gloves

**Signage Placed at the Entrance Doors**

**Detroit Medical Center Isolation Policy (DMC 2 IC 005 Isolation Policy)**

**Contact -** Carbapenem resistant Enterobacteriaceae(CRE), MDR-Acinetobacter, MDR Pseudomonas

**Contact Plus -** Clostridium difficile Infection(CDI).

**Personal Protective Equipment (PPE) located at point of use.**
Surgical Left Atrial Appendage Occlusion During Cardiac Surgery: A Meta-analysis
Varunsiri Atti, MD1, Mark TP Mujer, MD1, Shiva Shrotriya, MD1, Sowmika Rao, MD1, George Abela, MD1, Supratik Rayamajhi, MD1
1Department of Medicine; Michigan State University, East Lansing, MI;

INTRODUCTION
• The left atrial appendage is a common site for intracardiac thrombus formation in patients with atrial fibrillation (AF)
• Surgical left atrial appendage occlusion (s-LAAO) during concomitant cardiac surgery can reduce the risk of embolic events.
• There is limited data supporting routine s-LAAO.

METHODS
• Comprehensive literature search through May 1st 2018 for all eligible studies comparing s-LAAO versus no occlusion in patients undergoing cardiac surgery.
• Clinical outcomes: embolic events, stroke, all-cause mortality, atrial fibrillation, reoperation for bleeding and postoperative complications.
• Stratified analysis based on propensity matched studies and AF predominance.

RESULTS
• s-LAAO was associated with lower risk of embolic events (OR: 0.63, 95% CI: 0.53 to 0.76; p< 0.001) and stroke (OR: 0.68, 95% CI: 0.57 to 0.82; p< 0.0001).
• No significant difference in all-cause mortality (OR: 0.83, 95% CI: 0.51 to 1.36, p= 0.46), incidence of follow-up AF (OR: 1.41, 95% CI: 0.79 to 2.52, p= 0.24), post-op complications(OR: 1.44, 95% CI: 0.91 to 2.25; p= 0.12), or reoperation for bleeding (OR: 0.98, 95% CI: 0.57 to 1.69, p= 0.94).

DISCUSSION
• Concomitant s-LAAO during cardiac surgery was associated with lower risk of follow-up thromboembolic events and stroke, especially in those with AF without significant increase in adverse events.
• Further randomized trials to evaluate long-term benefits of s-LAAO are warranted.

REFERENCES
• PROTECT-AF and PREVAIL studies showed percutaneous LAAO being non-inferior to warfarin with respect to stroke rates and embolic events
• Concomitant LAA closure is given a Class IIb (level of evidence B) by the European Society of Cardiology (ESC)/European Society for Cardio-Thoracic Surgery (EACTS) guidelines and a Class Ib (level of evidence C) by the 2017 Society of Thoracic Surgeons guidelines
• s-LAAO was associated with lower rates of embolic events and stroke without significant difference in the incidence of all-cause mortality, postoperative complications or reoperations for bleeding.
• Association of lower risk of stroke was more prominent in subgroup with AF predominant population
• Successful s-LAAO is largely influenced by LAA morphology, occlusion technique and operator skill
• Evidence regarding the utilization of anticoagulation after s-LAAO is not clear
• The ongoing LAASOS-III (left atrial appendage occlusion study III) and the ATLAS (AtriClip® Left Atrial Appendage Exclusion Concomitant to Structural Heart Procedures) trials should be able to provide further insights into the benefits of s-LAAO.
Skin in the Game – Improving Internal Medicine Residents’ Comfort with Common Skin of Color Dermatologic Issues

Shankar Narayana Mundluru MD, Nirmala D. Ramalingam MPP, Patrick McCleskey MD, H. Nicole Tran MD PhD
Kaiser Permanente Oakland Medical Center, Oakland CA

Background

- By 2044, 54% of the US population will be skin of color
- Prevalence of skin disease varies by ethnicity and manifests uniquely in darker skin
- Resources underrepresent skin of color diseases
- 85% of internal medicine (IM) residents uncomfortable managing dermatologic issues

Methods

- Systems Analysis: literature review, resident survey, root cause analysis
- Gap analysis → curriculum development

Results

- Resident Survey Results:
  - Low confidence in identifying and treating basic skin of color conditions, 77.4% and 87.1% respectively
  - Identified scarcity of training and resources (90%)
- Curricular Innovation focused on resident engagement, lecture, faculty involvement, access to resources
- Structure: lecture, small group workshop, and interactive games session

Education and Innovation

Session 1 – Grand Rounds Presentation: Traditional Lecture

- Highlighter lack of research and education
- Epidemiology
- Feedback and discussion

Session 2 – Flipped Classroom

- 2 hour academic half day
- Overview of common skin conditions
- How to take Skin of Color photos
- Concluded with interactive iPhone Kahoot! game

Session 3 – Interactive Games

Game 1: Skin Matchmaker

Instructions:
- Match 10 images of skin of color and 10 identical conditions on lighter skin
- Describe differences and similarities between appearance
- Diagnosis
- Consideration for treatment on dark skin

Game 2: Guess Who? The Derm Term Version

Instructions:
- 3 participants provide clues
- 1 participant guesses condition
- Clues must first include visual description
- Then clues can include disease course, method of diagnosis, and treatment

Conclusions/Future Directions

- We developed a multimodal curriculum to engage learners and sustain knowledge.
- Post-intervention high satisfaction reported: 88-94% of respondents rated sessions as very good or excellent (5 point scale)
- Create an Online Interactive Module
- Engage experts in the field
- Expand teaching to other underserved populations (LGBT and older adults)
- Apply knowledge gained to clinical setting

References

6. “How Photography was Optimized for White Skin of Color.” https://priceonomics.com/how-photography-was-optimized-for-white-skin/.
Introduction

- Encephalitis is defined by the presence of an inflammatory process of the brain in association with clinical evidence of neurologic dysfunction, and the majority of the infectious causes of encephalitis are viruses.1
- Eastern equine encephalitis virus (EEEV) infection of humans is associated with >30% mortality and is classified as causing one of the most severe of arbovirus associated encephalitides.2
- EEEV is a rare illness in humans, with an average annual of 7 human cases reported. EEEV can result in either a systemic or encephalitis presentation.
- Those who recover are usually left with disabling mental and physical sequelae. 
- Laboratory diagnosis of arboviral infections is generally accomplished by testing of serum or cerebrospinal fluid (CSF) to detect virus-specific IgM and neutralizing antibodies.2
- The successful use of intravenous immunoglobulins has been published in a few cases.4 This was provided to our patient; however it did not show benefit in our case.
- Prevention of mosquito bites by using insect repellents and wearing long-sleeved shirts and long pants while outdoors is very important.5
- These cases should be immediately reported to the health department so there are community efforts to reduce mosquito populations.

Case Presentation

A 68-year old Caucasian woman was admitted to the intensive care unit at UF Health with deteriorating progressive neurological deficits. Originally, she presented with fever, lethargy, and delirium; family discovered her at her rural home and described her as being physically weak and confused. Upon presentation to UF Health, she was noted to be tachycardic, tachypneic, and febrile (40 degrees Celsius). She was intubated/ventilated in the ED due to worsening lethargy. Empiric meningoencephalitis treatment was initiated and a lumbar puncture was performed. Initial CSF studies demonstrated elevated leukocyte count of 810 cells/mm³ with 73% neutrophil predominance, yet glucose was normal (Table 1). MRI demonstrated increased T2 signal in deep gray nuclei (Figure 1). Infectious disease consult requested other studies: Varicella Zoster Virus, Epstein-Barr Virus, Enterovirus PCR panel, Herpes Simplex Virus, Histoplasma, Cryptococcus, paraneoplastic panel, and West Nile Virus were all reported. EEEV PCR from serum or CSF is not useful as viremia is brief in humans. In 2018, the Florida Department of Health reports an increasing amount of cases demonstrated by positive samples from three humans, fifty-two horses, and 153 sentinel chickens from thirty-three counties.5

While in the intensive care unit, an electroencephalogram showed non-convulsive status epilepticus and neurology recommended multiple anti-epileptic medications. Patients’ worsening autonomic dysfunction triggered repeat EEEV PCR collection 6 days later and sample was sent to the CDC for rabies testing, which resulted with EEEV IgM 1:512. The CSF EEEV IgM eventually resulted 1:32. Repeat MRI showed progressive increased T2 signal with diffuse involvement of cortex, temporal lobes, both frontal lobes, and left occipital lobe. Trial of IVIG was initiated based on prior case reports showing benefit, however the patient never recovered neurologically. After extensive family discussion, patient was discharged to long term care facility with tracheostomy and feeding tube.

<table>
<thead>
<tr>
<th>Figures</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.jpg" alt="Figure 1: Brain MRI showing abnormally increased T2 signal in the deep gray nuclei, stratum &gt; thalamus. (White arrow)" /></td>
</tr>
<tr>
<td><img src="image2.jpg" alt="Figure 2: Showing the human cases of EEEV in the United States for 2018)" /></td>
</tr>
<tr>
<td><img src="image3.jpg" alt="Figure 3: Geographic presentation of the incidence of EEEV cases in humans and animal across Florida in 2018)" /></td>
</tr>
</tbody>
</table>

Discussion

- In 2018, there were five confirmed cases of EEEV in the United States.
- Clinicians should consider EEEV in patients with encephalitis where other workup has been negative, especially in the eastern United States.
- Other clues for EEEV are myoclonus, autonomic dysfunction, and MRI changes of basal ganglia and thalamus.
- It is important to note that the IgM takes 7-10 days to develop. With high clinical suspicion in endemic areas, a repeat serology in 1 week is reasonable if the first test is negative.
- EEEV PCR from serum or CSF is not useful as viremia is brief in humans.
- In 2018, the Florida Department of Health reports an increasing amount of cases demonstrated by positive samples from three humans, fifty-two horses, and 153 sentinel chickens from thirty-three counties.5
- The morbidity and mortality rate are very high for EEEV and there is currently no treatment or vaccine available.
- Prevention of mosquito bites by using insect repellents and wearing long-sleeved shirts and long pants while outdoors is very important.5
- These cases should be immediately reported to the health department so there are community efforts to reduce mosquito populations.

References

**Chromobacterium violaceum** sepsis as a consequence of hurricane heroism and severe neutrophil deficiency

J. Patrik Hornak, MD - Alyssa L. Anderson, MD - Daniel A. Ortiz, PhD - Lola Carrete, MD - Lindsay K. Sonstein, MD - A. Clinton White, MD

The University of Texas Medical Branch, Galveston, TX

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**Background**

- Chromobacterium violaceum is a catalase-positive, oxidase-producing Gram-negative bacillus ubiquitous in aquatic and nearby environments. It is often isolated as a contaminant from water and soil samples.

- Human infections are exceedingly rare (< 200 reports, globally) but not uncommon, occurring particularly in the humid tropics.

- In the 1980s, a three-year-old boy fell victim to rapidly progressive septicemia from the rare *C. violaceum*. His twin brother was subsequently tested and found to have a unique variant of glucose-6-phosphate dehydrogenase deficiency (G6PD) with severe neutrophil deficiency identified with <5% cell positivity for nitroblue tetrazolium test and impaired intracellular bactericidal activity per modified Staphylococcus aureus Cowan strain 1 killing assay. This disease strain was subsequently named G6PD—Beaumont.

- In 2017, the surviving 35-year old twin was rescued victims from Hurricane Harvey flooding. He was wading in floodwaters with a recent skin wound he attributed to a "spider bite." Three days later, he fell victim to fever, chills, hemolytic symptoms, and a progressively worsening cutaneous abscess.

- Upon presentation to OSH, pt was septic and started on vancomycin + amikacin and underwent abscesses I&D.

- Therapy was ceased one week early due to diffuse arthralgias believed to be quinolone-induced.

- Over the next 48 hours, his fevers, thrombocytopenia, and hemolysis resolved with good tolerance to levofloxacin.

- CT imaging revealed numerous, small abscesses in the lungs, liver, and spleen.

- Based on literature review, therapy was changed to meropenem. Quinolones were noted to be the most potent agents.

- With worsening hemolysis refractory to 8 units of pRBCs, the patient was transferred to UTMB medical intensive care unit. Repeat WCs grew pigmented and non-pigmented strains of *C. violaceum*. Ferritin was elevated to 4800ng/mL, erythrocyte sedimentation rate (ESR) was elevated to 14mm/hr.

- In 2017, the surviving 35-year old twin was rescued victims from Hurricane Harvey flooding. He was wading in floodwaters with a recent skin wound he attributed to a "spider bite." Three days later, he fell victim to fever, chills, hemolytic symptoms, and a progressively worsening cutaneous abscess.

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- Therapy was ceased one week early due to diffuse arthralgias believed to be quinolone-induced.

- Over the next 48 hours, his fevers, thrombocytopenia, and hemolysis resolved with good tolerance to levofloxacin. Patient was discharged to complete six weeks total fluoroquinolone therapy.

- Therapy was ceased one week early due to diffuse arthralgias believed to be quinolone-induced.

- Repeat CT revealed resolution of hepatic and splenic abscesses. Ferritin decreased to 3800 and ESR to 6.

---

**Case Description**

- In the 1980s, a three-year-old boy fell victim to rapidly progressive sepsis from the rare *C. violaceum*. His twin brother was subsequently tested and identified as having a unique variant of glucose-6-phosphate dehydrogenase deficiency (G6PD) with severe neutrophil deficiency identified with <5% cell positivity for nitroblue tetrazolium test and impaired intracellular bactericidal activity per modified Staphylococcus aureus Cowan strain 1 killing assay. This disease strain was subsequently named G6PD—Beaumont.

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- Repeat CT revealed resolution of hepatic and splenic abscesses. Ferritin decreased to 3800 and ESR to 6.

---

**Clinical Timeline**

**DAY #** 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

**Antibiotics**

- **VAN + AMK**
- **VAN + AMK**
- **ATM + GEN + MTZ**
- **ATM + GEN + MTZ**
- **ATM + GEN + MTZ**
- **ATM + GEN + MTZ**
- **MEM**
- **MEM**
- **MEM**
- **MEM**
- **MEM**
- **MEM + LVX**
- **MEM + LVX**
- **MEM + LVX**
- **LVX**
- **LVX**

**Notes**

- Presents to OSH.
- Bloodside I&D completed.
- BCx w/ negative rods.
- 1st WcX w/ C. violaceum.
- Transfer to UTMB.
- ID consulted.
- BxC susceptibilities avail.: CT scan obtained.
- 2nd WcX w/ C. violaceum growth.
- Quinolone added.
- Discharged home to complete 6 wks of LVX.

**Selected Antibiotic Susceptibilities**

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>MIC (μg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetracycline</td>
<td>&lt;1 (S)</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>2 (S)</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>32 (R)</td>
</tr>
<tr>
<td>Cefepime</td>
<td>≤4 (S)</td>
</tr>
<tr>
<td>Aztreonam</td>
<td>≤4 (S)</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>≤0.12 (S)</td>
</tr>
<tr>
<td>Tetracycline</td>
<td>≤1 (S)</td>
</tr>
<tr>
<td>Meropenem</td>
<td>≤0.05 (S)</td>
</tr>
</tbody>
</table>

**Legend**

- AMK - amikacin
- ATM - ampicillin
- GEN- gentamicin
- LVX - levofloxacin
- MEM - meropenem
- TMZ - tobramycin
- VAN - vancomycin
- BCx - blood culture
- CT - computed tomography
- ESBL - extended-spectrum beta-lactamase
- I&D - incision & drainage
- pRBC - packed red blood cells
- Wx - wound culture

**References**

Bleeding Due To Acquired Dysfibrinogenemia As The Initial Presentation In Multiple Myeloma

Namrah Siddiq, MD, Colin Bergstrom, MD, Srikanth Nagalla, MD
UT Southwestern Medical Center, Dallas, TX

Learning Objectives

- Recognize that monoclonal gammapathy and multiple myeloma could be associated with acquired bleeding diathesis.
- Recognize that multiple myeloma needs to be considered as a possible etiology in patients who present with recurrent bleeds associated with dysfibrinogenemia.
- Recognize that reptilase time in addition to thrombin time is useful in the diagnosis of dysfibrinogenemia/hypofibrinogenemia.

Patient Presentation

- A 63-year-old man with a history of coronary artery disease and recent coronary artery bypass graft presented for work-up of bleeding diathesis with a history of easy bruising, prolonged bleeding with shaving, and hematuria over the past month.
- He was previously admitted to an outside hospital for abdominal pain and found to have a hemoglobin of 6 g/dL and CT findings revealing a new 7.6x7.0x6.5 cm peri-pancreatic hematoma.
- Physical exam demonstrated ecchymoses on his left shin and right upper arm and a lip hematoma.
- Labs on admission were notable for a low fibrinogen level of 105 mg/dL and findings of prolonged time (PTT) at 32.9, and a D-dimer of 1.37 mg/L.
- Work-up revealed a normal fibrinogen antigen level, prolonged thrombin time, slightly prolonged reptilase time, normal von Willebrand factor (vWF), and minimally decreased Factor VII, V, and X activity.
- Serum protein electrophoresis (SPEP) showed 0.11 g/dL oligoclonal bands; lambda free light chains (LFLC) were elevated at 302.92 mg/L with a kappa to lambda ratio of 0.05.
- Bone marrow biopsy revealed 20-25% lambda light chain restricted plasma cells and an MRI for spinal imaging was notable for two sacral lytic lesions.
- These collective findings suggested a diagnosis of multiple myeloma (MM).

Disease Course

- During his initial admission, the patient failed to respond to vitamin K treatment, with persistent bleeding from his bone marrow biopsy site and no change in his elevated PT/INR. He was treated with aminocaproic acid, cryoprecipitate, and vitamin K because of low fibrinogen levels and eventually discharged with aminocaproic acid and dexamethasone.
- After the diagnosis of MM was made, Hematology initiated Bortezomib (Velcade)/Dexamethasone (V/D) but following cycle 1 of that, the patient was admitted to an outside hospital for complications of a duodenal hematoma, requiring cryoprecipitate and fresh frozen plasma.
- The patient had a positive response to V/D treatment as evidenced by a decrease in LFLC to 97 mg/L and improvement in fibrinogen levels, thus the treatment was continued.
- Fibrinogen levels remained within normal limits until a month later when they dropped to 77 mg/dL, correlating with an increase in LFLC and a relapse of multiple myeloma. He was admitted soon thereafter for multiple intramuscular hematomas.
- He was then switched to Carfilzomib (Kyprolis)/Dexamethasone (K/D). Following worsening of his intramuscular hematomas, the patient was readmitted. K/D was continued with improvement in lambda free light chains and normalization of fibrinogen (Figure 1, Figure 2). The patient’s bleeding symptoms also resolved.
- Lenalidomide (Revlimid) was added to the treatment months later.
- The patient eventually had definitive therapy with an autologous peripheral blood stem cell transplant (PBSCCT).

Discussion

- Multiple myeloma has been associated with acquired dysfibrinogenemia. The mechanism is thought to be secondary to inhibition of fibrin polymerization by paraproteins (1). Several case reports have documented this finding (1-4).
- Other cases have highlighted patients with a prior diagnosis of multiple myeloma who then present with acquired dysfibrinogenemia based on lab abnormalities or bleeding tendencies. However, our case discusses a patient presenting with recurrent bleeds and dysfibrinogenemia, which after further work-up led to a diagnosis of multiple myeloma.
- Recurrent bleeds are a unique presentation for undiagnosed multiple myeloma, as illustrated in our case. Therefore, in middle-aged and older patients with recurrent bleeds and abnormal fibrinogen activity, multiple myeloma should be included in the differential as a possible etiology.
- Further lab studies should include an SPEP and serum free light chains. Lab abnormalities in support of dysfibrinogenemia include prolonged thrombin time and reptilase time (1,6). Reptilase time is used to rule out heparin contamination because it will be normal in the presence of heparin whereas thrombin time would be prolonged.
- In acquired dysfibrinogenemia, the fibrinogen level may range from low to slightly elevated (1-3, 5). Our patient had a normal fibrinogen antigen level but an abnormally low fibrinogen activity level, which raised concern for dysfibrinogenemia rather than hypofibrinogenemia.
- Previous cases have reported that in patients with MM and dysfibrinogenemia, treatment with chemotherapy or plasma exchange resulted in resolution of symptoms or of the underlying coagulopathy (1-3). Our case had a novel clinical course characterized by a refractoriness to treatment requiring a change in treatment from V/D to K/D.

References

INTRODUCTION
Among primary care offices in the United States, no-show rates vary widely from 5% to 55%. Missed appointments have been associated with:
- Increased acute care utilization
- Reduced access for other patients
- Worse health outcomes
- Decreased provider productivity
- Loss in clinic revenue

OBJECTIVE
Examine the financial implications of no-show appointments as well as the association between no-show rates at an urban internal medicine (IM) and family medicine (FM) residency continuity clinic based upon:
- Provider characteristics
- Appointment characteristics
- Patient characteristics

METHODS
- Retrospective chart review including all adult scheduled appointments from July 1, 2016 and December 4, 2017
- Appointment status was one of the following: attended, cancelled, no-showed, or scheduled
- No-show rate excluded cancelled appointments from the denominator
- Lost revenue was calculated based on what is billed for 99204, 99213, & 99214
- $χ^2$ test was used to analyze between group differences

RESULTS
- Overall no-show rate was 23.3% (n=11,137)
- No-show rate differed by provider type
  - Significantly lower among attendings, FM residents, and nurse practitioners vs IM residents
- For both the IM and FM practices, hospital discharge follow-up appointments had the highest no-show rate while pre-operative appointments had the lowest
- FM new patient and follow-up appointment were significantly lower compared to IM
- $2,092,260 in lost revenue from no-show appointments during the study period
  - Appointment type missing for 1,127 (2.1%)

CONCLUSIONS
- No-show rate is:
  - Higher among IM than FM residents
  - Higher among residents, regardless of specialty
  - Higher for new patient and hospital discharge follow-up appointments
- Costly

REFERENCES

DISCLOSURES: There are no financial conflicts for any of the authors.
Gastrointestinal Bleeding in AL Amyloidosis: Highlighting the importance of endoscopy

Samuel B. Reynolds, M.D.1,2, Harrison Daniel, M.D.1,2, Khushboo Gala, M.D.1,2, Nihar U. Shah, M.D.1,2
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University of Louisville School of Medicine

Introduction

Acute gastrointestinal bleeding (GI) has a wide differential, and often requires endoscopy to detect a source. Comorbid plasma cell dyscrasia, particularly when patients are undergoing stem cell transplant, makes diagnosis and subsequent management even more challenging.

It is important for providers, particularly when patients with amyloidosis are in a critical care setting, to maintain an open differential diagnosis in approaching gastrointestinal bleeding, as recognition of the source of bleeding is essential to enacting timely and effective treatment.

Admission and Initial Workup

A 70-year-old Caucasian man presented to the hospital reporting hematochezia. Past medical history included systemic AL amyloidosis, previously treated with 4 cycles of combination dexamethasone, ixazomib and lenalidomide, followed by dextran therapy for AL amyloidosis, previously treated with 4 cycles of combination dexamethasone, ixazomib and lenalidomide, followed by successful treatment.

On admission, the patient was alert, interactive and breathing comfortably. He was admitted to the floor in stable condition. On admission, the patient was alert, interactive and breathing comfortably. He was admitted to the floor in stable condition.

Family History:
- Father: Pancratic cancer
- Mother: No significant PMH

Social History:
- Smoking: 6-7 cigarettes per day
- Alcohol: Seldom
- Drug use: None

Review of Systems:
- Positive for diarrhea with BRBPR

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Hospital Course: Diagnostic Studies, imaging, outcome

• Continued hospital course:
  - <48 hours into patient’s admission, patient passed a large, blood-tined bowel movement
  - He subsequently developed seizure-like activity, became unresponsive and developed agonal breathing, with accompanying hypotension and bradycardia into the 40s. The patient was intubated and transported to an intensive care unit
  - Repeat laboratory studies revealed a Hgb/Hct of 7.1/22.1, lactate of 7.5
  - Patient administered 1g Keppra, volume resuscitation with 3L of Lactated Ringer’s and 2U PRBC
  - Head CT was negative for acute intracranial hemorrhage, mass or other structural defect
  - CT Abdomen and pelvis, colonoscopy results are shown below

![CT abdomen and pelvis](image1)

• Remainder of hospital course and current state
  - Patient was successfully extubated approximately 3 days after intubation and mechanical ventilation
  - <48 hours into patient’s admission, patient passed a large, blood-tined bowel movement
  - He subsequently developed seizure-like activity, became unresponsive and developed agonal breathing, with accompanying hypotension and bradycardia into the 40s. The patient was intubated and transported to an intensive care unit
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  - CT Abdomen and pelvis, colonoscopy results are shown below

![Colonoscopy images](image2)

![Figure 2: Colonoscopy Images](image3)

Discussion

Amyloidosis is defined as abnormal extracellular protein fibril deposition affecting multiple organs, including the heart, lungs, gastrointestinal tract, and liver. GI involvement is reported in 79% of systemic cases, with deposits being found anywhere along the GI tract, from the esophagus to the colon, although the duodenum, stomach, and rectum are most commonly involved2,3. Oral lesions are common in both AA and AL amyloidosis, and tend to be more common in AL, and are themselves rare, as oral amyloid more commonly presents as macroglossia4,5.

Regarding the pathophysiology of GI amyloidosis, increased fragility of the adjacent blood vessels results in local ischemia, infarction, and mucosal injury4,6. AL amyloidosis is associated with bulk deposition causing mucosal protrusions, while AA amyloidosis is associated with diffuse deposition causing mucosal friability and ulceraions. Amyloid deposits, regardless of subtype, tend to reside in the vascular wall and predominately in the submucosa; they are confirmed by biopsy Congo red staining.

Consideration for ischemic collit is in the presented patient was warranted in light of recent therapy with lenalidomide, in addition to concurrent hypovolemic shock. Ischemic collit, which tends to be self-limiting, does not traditionally require endoscopic intervention for hemostasis. Moreover, GI bleeding in amyloidosis is generally managed supportive, as the course of the disease is also relatively benign2,3. Current guidelines for GI bleeding, however, indicate that endoscopic management within 24 hours of hemodynamic stabilization leads to improved outcomes7. Taking these results into consideration, it would be reasonable for providers to perform colonoscopy in cases of amyloidosis with ischemic collit.

References

Choosing Daily Labs in the Hospital:
Evaluation of Novel Lab Appropriateness Criteria

Caleb Murphy, Jill Bowman Peterson MD, Alisa Duran MD
Disclosure

- *Putting Stewardship into Medical Education and Training* grant
  - American Board of Internal Medicine Foundation
Wasteful Labs: A National Problem

• Overtreatment wastes $192 billion annually in US\textsuperscript{1}
  – Costliest waste category for CMS and 2\textsuperscript{nd} overall
• 4-5 billion lab tests performed annually in US\textsuperscript{2}
• 2013 meta-analysis of inappropriate lab testing data from 1997-2012 found that\textsuperscript{2}:
  – 25.0\% of US labs ordered inappropriately (14.0, 36.1)
  – 19.1\% of chemistry labs overutilized (14.3, 24.0)
  – 33.3\% of hematology labs overutilized (20.2, 46.3)
• HOWEVER: No common guidelines to define appropriateness of common lab tests
Goals

• Develop criteria:
  – to guide identification of inappropriate CBCs and electrolyte panels consistent with rates in national literature
  – usable by a range of skill levels, from medical students to experienced clinicians
Criteria Development Process

1. Drafted by two internists with experience in high value care and inpatient medicine
   • Starting point was Society of Hospital Medicine’s Choosing Wisely\(^3\) recommendation #5

2. Reviewed/revised by UMN Division of General Internal Medicine faculty

3. Subsequent revisions after review by national AAIM High Value Care Workgroup
Criteria Development Process

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### CBC criteria

<table>
<thead>
<tr>
<th>Appropriate</th>
<th>Inappropriate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days 0-2 of admission, 2 days since last lab, or vitals unstable</td>
<td>Stable labs and vitals for &gt;2 days</td>
</tr>
<tr>
<td>Leukocytosis/-penia present</td>
<td>Leukocytosis/-penia resolved on prior day</td>
</tr>
<tr>
<td>Bleed or Hgb below baseline</td>
<td>Hgb normal or baseline for 2 days</td>
</tr>
<tr>
<td>Thrombocytopenia/-cytosis relative to baseline</td>
<td>Platelets normal or trending towards normal for 2 days</td>
</tr>
<tr>
<td>Procedure on day prior</td>
<td>&gt;24 hrs after procedure</td>
</tr>
<tr>
<td>If confirming potential lab error</td>
<td>Full CBC after blood or platelet transfusion</td>
</tr>
</tbody>
</table>
# Electrolyte Panel criteria

<table>
<thead>
<tr>
<th>Appropriate</th>
<th>Inappropriate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days 0-2 of admission, 2 days since last lab, or vitals unstable</td>
<td>Stable labs and vitals for &gt;2 days</td>
</tr>
<tr>
<td>&gt;2 components needed (Na, Cl, etc.)</td>
<td>2 or fewer components needed</td>
</tr>
<tr>
<td>Acidosis/alkalosis present and not chronic</td>
<td>Acidosis/alkalosis resolved or at baseline</td>
</tr>
<tr>
<td>Hypernatremia/hyponatremia</td>
<td>Normal sodium</td>
</tr>
<tr>
<td>Diuresis or on nephrotoxic med</td>
<td>No diuresis or nephrotoxic med</td>
</tr>
<tr>
<td>Imaging study with contrast day prior</td>
<td>&gt;48 hrs after imaging study</td>
</tr>
<tr>
<td>Procedure on day prior</td>
<td>&gt;24 hrs after procedure</td>
</tr>
<tr>
<td>Day of hemodialysis</td>
<td>Not day of hemodialysis</td>
</tr>
<tr>
<td>If confirming potential lab error</td>
<td></td>
</tr>
</tbody>
</table>
Methods

• Reviewed 50 inpatient stays
  – Inclusion: Admitted to medicine service for 3-10 days
  – Exclusion: ICU admission, diagnosis of cirrhosis
  – 461 daily labs total (253 BMPs, 208 CBCs)
Rating System

• Dichotomous Scale (DS)
  – A = Appropriate
  – N = Not Appropriate

• 3-point Likert Scale (LS)
  – 3 = Appropriate
  – 2 = Equivocal
  – 1 = Not Appropriate
## Results: CBC Appropriateness

<table>
<thead>
<tr>
<th>Rating Agreement</th>
<th>Percentage (95% CI)</th>
<th>DS (A,N)</th>
<th>LS (1,2,3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inappropriate (1)</td>
<td>25.0 (19.1, 30.9)</td>
<td>16.8 (11.7, 21.9)</td>
<td></td>
</tr>
<tr>
<td>Equivocal (2)</td>
<td>--</td>
<td>12.02 (7.6, 16.4)</td>
<td></td>
</tr>
<tr>
<td>Appropriate (3)</td>
<td>65.4 (59.0, 71.9)</td>
<td>40.4 (33.7, 47.1)</td>
<td></td>
</tr>
</tbody>
</table>
## Results: Electrolyte Panel Appropriateness

<table>
<thead>
<tr>
<th>Rating Agreement</th>
<th>Percentage (95% CI)</th>
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<th>LS (1,2,3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inappropriate (1)</td>
<td>24.1 (18.8, 29.4)</td>
<td>20.2 (15.2, 25.1)</td>
<td></td>
</tr>
<tr>
<td>Equivocal (2)</td>
<td>--</td>
<td>7.11 (4.0, 10.3)</td>
<td></td>
</tr>
<tr>
<td>Appropriate (3)</td>
<td>62.1 (56.1, 68.0)</td>
<td>41.1 (35.0, 47.2)</td>
<td></td>
</tr>
</tbody>
</table>
## Results Comparison

- Percent inappropriate (95% CI)

<table>
<thead>
<tr>
<th><strong>CBC</strong></th>
<th><strong>Electrolytes</strong></th>
<th>US^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.0 (19.1, 30.9)</td>
<td>24.1 (18.8, 29.4)</td>
<td>25.0 (14.0, 36.1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hematology^2</th>
<th>Chemistry^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>33.3 (20.2, 46.3)</td>
<td>19.1 (14.3, 24.0)</td>
</tr>
</tbody>
</table>
Results Comparison

- Percent inappropriate (95% CI)

<table>
<thead>
<tr>
<th><strong>CBC</strong></th>
<th><strong>Electrolytes</strong></th>
<th>US²</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.0 (19.1, 30.9)</td>
<td>24.1 (18.8, 29.4)</td>
<td>25.0 (14.0, 36.1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hematology²</th>
<th>Chemistry²</th>
</tr>
</thead>
<tbody>
<tr>
<td>33.3 (20.2, 46.3)</td>
<td>19.1 (14.3, 24.0)</td>
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</tbody>
</table>
### Results: Inter-Rater Reliability

<table>
<thead>
<tr>
<th>Test</th>
<th>Comparison</th>
<th>Cohen’s kappa (95% CI)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>DS (A,N)</td>
<td>LS (1,2,3)</td>
</tr>
<tr>
<td>CBC</td>
<td>Faculty vs Student</td>
<td>0.77 (0.68, 0.87)</td>
<td>0.62* (0.52, 0.72)</td>
</tr>
<tr>
<td>BMP</td>
<td></td>
<td>0.68 (0.58, 0.78)</td>
<td>0.58* (0.49, 0.67)</td>
</tr>
</tbody>
</table>

**Interpretation**

- Poor = <0.20
- Fair = 0.21 – 0.40
- Moderate = 0.41-0.60
- Good = 0.61-0.80
- Very Good = 0.81-1.0

*weighted Cohen’s kappa*
Limitations

- Single institution
- Small sample size
- Criteria development process
Next Steps

• Validate criteria with more structured process
• EMR integration
• Scale: implementing across institutions
Thank you!

Questions?

Caleb Murphy: caleb.murphy@unlv.edu
References


BACKGROUND

- Acute coronary syndrome (ACS) includes unstable angina, non-ST elevation myocardial infarction, and ST elevation myocardial infarction.
- Risk factors for ACS include hypertension, hyperlipidemia, diabetes, and other common comorbidities.
- The HEART score is a risk calculator that was developed in 2008 to determine the risk of major adverse cardiac events within 6 weeks of presentation to the ED with chest pain.¹
- HEART scores estimate patient risk for major adverse cardiac events within 6 weeks. It uses history, electrocardiogram, age, risk factors, and troponin.¹

OBJECTIVE

- To better understand ACS risk factors and HEART Scores in a population of patients who presented to a community hospital ED with chest pain and were ultimately diagnosed with ACS.

METHODS

- Retrospective cohort study using EHR data
- In a previous study, we demonstrated that 14% (n=249) of adults who presented with chest pain to the ED of a community hospital in suburban Oregon in 2016 were eventually diagnosed with ACS (Figure 1).
- For the present study, demographic data and data on risk factors for ACS were collected on the 249 patients who had ultimately been diagnosed with ACS.
- Chart review was performed to fill in additional information on gender, age, ECG, troponin, and risk factors including: DM, HLD, HTN, Smoking status, personal and family history of ACS, and Obesity.
- HEART Scores were calculated for each patient.

RESULTS

- Data about risk factors of those diagnosed with ACS were determined (Table 1).
- Results showed a high burden of hypertension (78%), hyperlipidemia (64%), and an overall high burden of our measured risk factors (98% had at least one risk factor).
- Average patient HEART Score was 6.3, which corresponds to a moderate to high risk of a major adverse cardiac event within 6 weeks.
- Results showed a higher burden of hypertension (78%) and hyperlipidemia (64%) in this population than in the general population. Studies have estimated the prevalence of hypertension to be between 25% to 38% and the prevalence of LDL to be between 20% and 27% in the general population².
- 49 patients who were not diagnosed with ACS at their initial ED encounter had a moderate or high HEART Score at the time of their ED encounter. With utilization of HEART Score, these patients would likely have had further workup and possibly earlier detection.
- These findings elucidate prevalent risk factors and the functionality of the HEART Score in our community ED for adults who present with chest pain.

CONCLUSIONS

- To further validate the use of the HEART Score, we plan to collect data on a sample of patients who were not diagnosed with ACS after presenting to the ED with chest pain. We will calculate HEART Scores for this group in order to compare scores and risk factors across those with vs without ACS.
- To further characterize the group of patients who were not diagnosed at their initial ED encounter for chest pain, to determine whether proper workup for ACS was performed, and whether the use of the HEART Score could have assisted in earlier diagnosis.

FUTURE IMPLICATIONS

- Across all HEART Score groups, a majority of patients were diagnosed on the same day as their ED encounter for chest pain (75%-81%) or within 6 weeks of the ED encounter (14%-25%) (Table 2).
- 111 individuals (45%) were in the high risk category for HEART Scores, 130 (52%) were moderate risk, and 8 (3%) were low risk (Figure 2).
- 51 patients were diagnosed with ACS more than 24 hours after presentation. However, at the time of their presentation to the ED, 49 of them had moderate or high risk HEART Scores (96%).

REFERENCES

Adoption of the Coronary Artery Disease — Reporting and Data System (CAD-RADS™) Reduces Downstream Testing and Subspecialty Referral in Patients with Nonobstructive CAD Compared To Non-Standardized Reporting

Joshua M Boster, MD; Robert A Hull, MD; Jeremy M Berger, DO; Michael U Williams, MD; Alec J Sharp, MD; Dustin M Thomas, MD

1Department of Medicine, San Antonio Military Medical Center, Joint Base San Antonio-Fort Sam Houston, TX, USA
2Department of Cardiology, San Antonio Military Medical Center, Joint Base San Antonio-Fort Sam Houston, TX, USA
3Department of Flight Medicine, Little Rock Air Force Base, AR.
4Department of Medicine, Division of Cardiology, Women Alpert School of Medicine, Brown University, Providence, RI.

Introduction

Coronary CT angiography (CTA) has emerged as a first line test for stable and acute chest pain1. Existing data suggests that CTA may increase downstream testing, particularly invasive angiography and revascularization2.

We examined the impact of a standardized CTA reporting template (CAD-RADS™), which provides results-based management recommendations, on downstream testing and subspecialty referral.

Methods

CCTAs between 01May2015 and 30Jun2017 were queried (n=2,000), resulting in 1796 CCTAs performed for the evaluation of CAD: 751 using CAD-RADS™ and 1,045 using non-standardized reporting (NSR).

Ordering provider specialty, baseline demographics, downstream testing and subspecialty referral were abstracted.

CCTAs were interpreted by maximal stenosis: no CAD or stenosis (normal or CAD-RADS 0), 1-49% (nonobstructive or CAD-RADS 1/2), or ≥50% (obstructive or CAD-RADS 3, 4, or 5).

Table 1. Demographic Characteristics

<table>
<thead>
<tr>
<th>Demographics</th>
<th>CAD-RADS™</th>
<th>NSR</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethnicity:</td>
<td>(n=751)</td>
<td>(n=1045)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>387</td>
<td>536</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>136</td>
<td>187</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>57</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>171</td>
<td>319</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>50±12</td>
<td>49±13</td>
<td>0.133</td>
</tr>
<tr>
<td>Male gender</td>
<td>446 (59.4%)</td>
<td>577 (55.2%)</td>
<td>0.082</td>
</tr>
<tr>
<td>Active Smokers</td>
<td>94 (12.5%)</td>
<td>165 (15.8%)</td>
<td>0.057</td>
</tr>
<tr>
<td>Diabetes</td>
<td>111 (14.8%)</td>
<td>137 (13.1%)</td>
<td>0.332</td>
</tr>
<tr>
<td>Hypertension</td>
<td>364 (48.5%)</td>
<td>499 (47.8%)</td>
<td>0.774</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>333 (44.3%)</td>
<td>468 (44.8%)</td>
<td>0.885</td>
</tr>
<tr>
<td>Known CHD*</td>
<td>53 (7.1%)</td>
<td>77 (7.4%)</td>
<td>0.854</td>
</tr>
</tbody>
</table>

*Coronary Artery Disease – Reporting and Data System; !Non-standardized reporting; CHD Coronary heart disease

Results

Coronary CTA has emerged as a first line test for stable and acute chest pain1.

We examined the impact of a standardized CTA reporting template (CAD-RADS™), which provides results-based management recommendations, on downstream testing and subspecialty referral.

Table 1. Demographic Characteristics

Figure 1. Comparison of Referral Rate for Downstream Testing Based on the Presence of Coronary Artery Disease for the CADRADS vs. NSR Cohorts

Amongst the nonobstructive CAD scans in the NSR cohort referral for downstream testing was significantly more common (14.4% vs 5.1%, p<0.001) compared to the CADRADS cohort.

Furthermore referrals to Cardiology were significantly more common for non-obstructive CAD in the NSR cohort compared to the CADRADS cohort (14.1% vs. 7.5%, p=0.012).

Referrals for invasive coronary angiography was similar between the groups (p=0.638).

After excluding normal or non-diagnostic CCTAs, downstream testing was more common in the NSR cohort (23.4% vs 15.5%, p=0.009) without an increase in obstructive CAD detection on ICA (74.2% vs 66.7%, p=0.565).

Conclusions

Adoption of CAD-RADS standardized CTA reporting template did not increase downstream testing rates overall and resulted in a reduction in both downstream testing and cardiology referral amongst patients with nonobstructive CAD.

Increased testing and cardiology referral amongst nonobstructive CAD patients in NSR did not improve detection of obstructive CAD.

CAD-RADS™ potentially resulted in a cost savings by way of decreased downstream testing and cardiology referrals which was not quantitatively measured.

References