2019 submissions

More than 30 students, residents and fellows submitted abstracts and case studies to Minnesota Medicine. Five of those considered of exceptional quality—although quality overall was very good—were published in the November/December issue of Minnesota Medicine. Four are published in this issue and another four will be published in the January/February 2020 issue.

Physician reviewers looked at each manuscript to determine whether the research or case description was clear and complete, whether the methodology was sound, whether the scientific literature review was sufficient and whether the findings had implications for future research.

We thank our reviewers: Devon Callahan, MD; Siu-Hin Wan, MD; Zeke McKinney, MD, MHI, MPH; and Barbara Yawn, MD. Callahan and Wan are members of the Minnesota Medicine Advisory Board; Yawn, now retired, is a former member. McKinney is chief medical editor of Minnesota Medicine.

AS GOOD A TIME AS ANY?

Patient attitudes toward advance care planning discussion during pre-operative visits

BY MICHAEL BERRES, BS; DARRELL RANDLE, MD; JOYCE WAHR, MD; KATHLEEN HARDER, PHD; KAREN PETERSON, RN; AND HEIDI MEYERS, RN, MBA, MHCM

Background / Objective

Although its value to clinicians, patients,1 and healthcare costs2 is undisputed, completion rates of advance care planning (ACP) of any type are estimated at a third of U.S. adults.3 A principal reason for not completing ACP is lack of provider initiative.4,5 Because patients require an appointment with a provider before planned surgery, and because minimal studies of ACP in the pre-operative setting have been conducted,6 our aim was to evaluate patient attitudes toward ACP discussion in a pre-operative assessment center (PAC) as a means to increase ACP completion.

Methods

A 13-question paper survey with an introduction about ACP was distributed to all patients over age 18 visiting the PAC at the University of Minnesota. Questions ranged from demographics, anxiety regarding the operation, beliefs regarding ACP, and perceived optimal time for ACP discussions.

Results

Ninety-six patients completed the survey, with 47% of respondents having previously completed some form of ACP. Of those who had not previously filled out any type of ACP, the most common reason (38%) was not being asked to complete one by a provider; four people stated they had no desire to complete any form of ACP. Patients’ views of when is the best time to discuss ACP and patients’ rating of comfort with speaking about ACP during a pre-operative appointment are shown in Figure 1 and Figure 2.

Discussion

Our primary goal was to assess patient reception to discussing ACP during a pre-operative appointment with a provider.
other than their usual primary care provider (PCP). Results from Figure 2 show the most common response was patients strongly agreeing to feeling comfortable discussing ACP during a pre-op appointment, and that 64/83 (77%) of responders were neutral (response of 4) or better in regards to discussing ACP during a pre-op assessment. This, coupled with results from Figure 1, demonstrate that although patients still preferred their PCP for ACP discussions, 21% of respondents would choose pre-op as the best time to discuss ACP, and discussing ACP during pre-op would only be deemed uncomfortable for a small percentage of patients.

Providers may be leery of such a discussion during a pre-operative appointment at the risk of increasing stress for an already anxious patient. However, as seen in Figure 3, there was no correlation (R² 0.002) between anxiety level and average comfort level discussing ACP during the pre-operative appointment.

Future research will revolve around gathering provider input and optimizing interventions in the pre-operative assessment theater.

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Advancing effective healthcare for sexual and gender minority pediatric patients: an evaluation of the LGBTQIA+ symposium

BY BAILA ELKIN, TOBIAS DONLON, ANNA DOVRE, MARVIN SO, KATHERINE BECK-ESMAY, KRISTIN CHU, AND KYLIE BLUME

Background

Multi-level factors including stigma, social inequity, and lack of awareness among health care providers drive health disparities experienced by LGBTQIA+ populations. To address this, the Sexual and Gender Minority Health Initiative organized a three-hour symposium focusing on care for LGBTQIA+ children and youth. We hypothesized that participating in the symposium, involving interprofessional didactic and active learning components, would promote increased effectiveness working with this population.

Methods

Sixty-seven individuals completed a retrospective pre-then-post evaluation survey. Respondents included graduate students (48%), healthcare providers (21%), community members (19%), and undergraduate students (12%). The survey assessed five indicators of the symposium’s effectiveness: knowledge about this population, comfort in discussing their healthcare needs, confidence in finding resources, comfort in interacting with this population, and comfort in recommending care for this population. We conducted 1-tailed paired t-tests to evaluate the effectiveness of the symposium, and ANOVA tests to compare differences by professional role.

Results

Participants reported significantly higher (p<0.001) scores across all five measures of effectiveness from pre- to post-symposium. By role, scores significantly improved (p<0.05) for all measures except comfort in interacting with LGBTQIA+ patients. Results from Figure 1, demonstrate that although patients still preferred their PCP for ACP discussions, 21% would choose pre-op as the best time to discuss ACP, and discussing ACP during pre-op would only be deemed uncomfortable for a small percentage of patients.

![Bar graph showing pre- and post-Symposium responses across five measures of effectiveness. Error bars show 95% confidence intervals. Pre- and post-Symposium results are significantly (p<0.05) different for all five measures. n≥57.](https://example.com/bar-graph.png)
Levamisole-induced vasculitis leading to bilateral leg amputation

BY ADARSH RAVISHANKAR, BS; ROBERT PUERINGER, MD; AND SAMUEL IVES, MD

Levamisole is an anthelmintic medication frequently used as a cutting agent in cocaine. It is increasingly associated with an autoimmune vasculitis that can result in formation of necrotic bullae. The syndrome typically improves with cocaine cessation, but has been reported to cause irreversible damage. We report a case of severe levamisole-induced vasculitis resulting in bilateral lower extremity gangrene and subsequent amputation.

Case Report
A 55-year-old male with known COPD, systolic heart failure, and severe cocaine and alcohol use disorders, was admitted with altered mentation, dyspnea, and acute onset bilateral lower leg pain. He was found to have acute crack-cocaine intoxication, acute alcohol withdrawal, and sepsis with acute respiratory failure from pneumonia, necessitating intubation. Examination was notable for painful, purpuric, retiform, and bullous skin lesions with central ulceration on his lower extremities. Labs revealed thrombocytopenia.

The evening of admission, the patient’s cutaneous lesions rapidly evolved into necrotic bullae and spread to his ears, nose, and shoulders. Examination by dermatology showed progression of the skin lesions with enlarging fluid-filled bullae with central necrotic ulcerations (Figure 1). Given the clinical history, rapidly evolving skin lesions, and newly-discovered documentation referring to biopsy-confirmed levamisole-induced vasculitis three years prior, there was concern for levamisole-induced vasculitis.

Over the next few months, the patient’s skin lesions became progressively necrotic and he developed secondary bacterial infections of both legs, ultimately resulting in bilateral lower extremity amputations (Figure 2).

Discussion
Levamisole is an anthelmintic medication that works as a ganglionic nicotinic agonist. Although indicated for veterinary helminthic infections, over the past two decades levamisole has been increasingly used as a “cutting agent” for cocaine. It increases bulk, boosts purity, and may potentiate the stimulant effects of cocaine. In 2009, the DEA reported 69% of adulterated cocaine contained levamisole.

Levamisole is known to cause bone marrow suppression that can result in various cytopenias. It is also associated with an autoimmune vasculitis that presents with painful, purpuric, retiform (net-like) rashes with hemorrhagic bullae that progress to necrotic ulcerations. The lower extrem-
ties are most often involved followed by the ears, nose, and cheeks. Although there have been case reports of levamisole-induced vasculitis leading to unilateral lower extremity gangrene and amputation, this is the first known case to result in bilateral lower extremity amputations.\(^5, 6\)

Diagnosis is based upon clinical history and biopsy results. Histologically, the cutaneous lesions are characterized by microvascular thrombi and/or leukocytoclasis vasculitis indicative of a combined thrombotic vasculopathy and small vessel vasculitis.\(^7\) Laboratory analysis often shows positive ANA titers, anti-MPO/PR3 antibodies, or p-ANCA.\(^2, 7, 8\)

Management of levamisole-induced vasculitis involves cessation of levamisole-laced cocaine use and supportive cares.\(^9\) Corticosteroids have not shown clinical benefit in reported cases.\(^10\) Major disease or skin necrosis should be managed in a burn unit with a multidisciplinary care team.\(^10\)

In conclusion, levamisole-induced vasculitis is a severe autoimmune reaction that can result from recent cocaine exposure. Although often reversible, symptoms may progress to the point of limb gangrene that requires amputation. Early detection and cessation of cocaine exposure are essential. MM

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Persistent confirmed Barrett’s associated low-grade dysplasia is a risk factor for progression to high-grade dysplasia and adenocarcinoma in U.S. veterans

BY KEVIN SONG, MD

The current management of dysplastic Barrett’s esophagus (BE) involves surveillance and endoscopic eradication therapy (EET). Higher degrees of dysplasia confer increased risk of esophageal adenocarcinoma (EAC) and management decisions are made based on the degree of dysplastic changes. While high-grade dysplasia (HGD) and early stage esophageal adenocarcinoma (EAC) are best managed with EET, the management of patients with confirmed low-grade dysplasia (LGD) remains controversial. The benefits of EET for LGD must be weighed against the attendant risks, costs, and uncertain long-term benefits. For these reasons, additional risk stratification can be helpful in charting the management course.

Aim
To determine the incidence of HGD/EAC in patients with confirmed LGD.
and evaluate the risk associated with persistent confirmed LGD as compared to non-persistent confirmed LGD in veterans undergoing regular endoscopic surveillance for BE.

**Patients and methods**

Patients with BE and a histopathologic diagnosis of confirmed LGD between 2006 and 2016 were identified from the Minneapolis Veterans Affairs pathology database (n = 69). Confirmed LGD was defined as LGD diagnosed by pathology consensus conference. Persistent LGD was defined as LGD present on subsequent endoscopic biopsy at least three months after the initial diagnosis of LGD. The electronic medical records system was utilized to collect demographic and clinical variables including past medical history, EGD findings, histopathology, and lifestyle risk factors. The primary outcome was the incidence rate of HGD/EAC in patients with persistent confirmed LGD undergoing endoscopic surveillance for BE. Multivariate logistic regression analysis was used to assess the association between outcomes and risk factors for progression. Kaplan-Meier curve was used to evaluate progression probability then compared using Wilcoxon signed-rank test.

**Results**

In total, 16 of 69 patients (23.2%) with confirmed LGD developed HGD/EAC during a median follow-up of 3.74 years (IQR, 1.24-5.45) and median 6.00 endoscopies (IQR, 2.75-9.25). The overall annual incidence rate of HGD/EAC was 6.08 cases per 100 patient-years (95% CI, 3.60-9.67). For patients with persistent confirmed LGD the rate was 6.44 (95% CI, 2.61-13.40) compared to those with non-persistent LGD where the rate was only 2.61 cases per 100 patient-years (95% CI, 0.83-6.30). A Kaplan-Meier curve (Figure) displays the statistical difference between persistent and non-persistent confirmed LGD (p=0.0235). Persistent confirmed LGD was found to be an independent risk factor for the development of HGD/EAC with OR of 4.18 (95% CI, 1.03-17.1).

Hiatal hernia was also associated with dysplastic progression (p=0.047). Other risk factors did not impact the risk of developing HGD/EAC.

**Conclusion**

In this retrospective VA cohort study, persistent confirmed LGD is an independent risk factor for the development of HGD/EAC. Patients who fail to show evidence of confirmed LGD at follow-up endoscopy are at lower risk of progression. Close surveillance may, therefore, be an appropriate initial strategy for confirmed LGD, with triage to EET versus continued surveillance decided after evaluation for persistence. The predictive value of persistence or non-persistence with respect to risk of progression can be used to make more informed decisions about the potential benefits and harms of EET or continued surveillance.

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