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1026. Trends in Infective Endocarditis During the Substance Use Disorder Epidemic at an Academic Medical Center

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Background. In many areas of the United States, substance use disorders (SUD) have increased dramatically over the past decade. Overdose deaths have increased as well, and Kentucky ranks among the nation's leaders in deaths per 100,000 population. Infective endocarditis (IE) is a well-known complication of intravenous drug use, contributing to significant morbidity and mortality, but few studies have evaluated the effect of the current SUD epidemic on rates and demographics of IE. We sought to examine the trends in IE and IE with SUD at our institution.

Methods. We collected data from patients admitted to a large academic medical center in Kentucky between January 1, 2013 and December 31, 2016. Patients were classified according to the International Classification of Diseases, Tenth Revision. Patients were considered to have IE if they received codes I33 or I38. Patients were considered to have an SUD if they received codes F11.10, F15.10, F14.10, F19.10, or Z86.59. Data were collected through the TriNetX database (TriNetX, Cambridge, MA).

Results. There were 2,100 cases of IE during the study period. The mean (SD) age was 53 years (21). Of those, 440 also had an SUD. The mean (SD) age of these patients was 41 years (11). Patients in both the IE and IE/SUD categories were primarily male (54% and 55%) and white (94% and 94%). The number of cases of IE increased from 190 in 2013 to 430 in 2016 ($R^2 = 0.9877$). The number of IE cases diagnosed as having an SUD increased from 30 (16% of all IE cases) in 2013 to 130 (30% of all IE cases) in 2016 ($R^2 = 0.7352$ for the trend). This increase in cases corresponds to a 333% increase in the number of cases of IE with SUD.

Conclusion. Between 2014 and 2016, opioid overdose deaths in Kentucky rose from 24.7 to 33.5 per 100,000 population, a 35.6% increase. During a similar time-frame, the number of IE cases associated with SUD at our institution rose 333%. While it is possible that increased coding of substance use disorders factored into this dramatic increase, it appears that the number of IE cases associated with SUD is rising at a disproportionately rapid rate.

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1027. Outpatient Parenteral Antimicrobial Therapy (OPAT) in Injection Drug Users (IDUs): Is It Safe?

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Background. OPAT is widely implemented in the United States. However, there are concerns surrounding discharge of IDU with a peripherally inserted central catheter (PICC). The objective of this study was to evaluate the characteristics and treatment outcomes of IDUs discharged on OPAT.

Methods. This is a retrospective observational study conducted on patients discharged from an Infectious Diseases unit at a quaternary academic healthcare center in Detroit. Charts of all IDUs discharged on OPAT between 2011 and 2017 were reviewed. Current or former IDU were discharged on OPAT if they met the following criteria: self-reported history of IDU, stable living conditions, controlled psychiatric illness (if present), and willingness to sign a discharge agreement to refrain from using the PICC as a route for illicit drugs. Patients were categorized based on clinic follow-up vs. no clinic follow-up. Outcomes evaluated were: cured (completed treatment and symptom free for 1 month after completion), improved (symptoms were improved but there was no confirmation of treatment completion); and relapsed (readmitted within 30 days for the same infection or sequela). Outcomes of patients with no clinic follow-up were based on chart review of subsequent emergency department visits or admissions.

Results. Patient characteristics are shown in Table 1. Of the 61 patients evaluated, 33 (54.1%) attended clinic follow-up and 28 (45.9%) did not. Outcomes based on clinic follow-up are shown in Table 2. Of the 18 patients who were cured, 16 attended clinic follow-up vs. two who did not.

Conclusion. This study demonstrates that some IDUs can be discharged safely on OPAT. Patients with clinic follow-up had improved outcomes compared with those who did not. Further studies are needed to look at other predictors of outcome in this patient population.

Table 1: Patient Characteristics

	Patients N = 61 (%)
Age (mean ± SD)	±12.4
Male	33 (54.1)
Length of stay (days) mean ± SD	± 10.9
IVDU status	
Active	49 (80.3)
Former	10 (16.4)
Unknown	2 (3.3)
Psychiatric illness Disposition	12 (19.7)
Home	37 (60.6)
Nursing facility	24 (39.3)

Table 2. Outcome Based on Clinic Follow-up

	Clinic Follow-up N = 33 (%)	No Clinic Follow-up N = 12 (%)	P value
Cured	16 (48.5)	2 (16.7)	0.086
Improved	14 (42.4)	6 (50)	0.74
Relapsed	3 (9)	4 (33.3)	0.069

Sixteen patients were excluded from the analysis because their outcome was unknown.

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1028. Synergizing Infectious Diseases and Substance Use Treatment to Improve the Outcomes of Endocarditis in People Who Inject Drugs at a Large Academic Hospital

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Background. Philadelphia is at the epicenter of the urban opioid epidemic: currently more than 70,000 individuals use heroin and in the year 2017 there were 1,200 overdose deaths. Endocarditis in patients with opioid use disorder (OUD) requires long hospitalizations for IV antibiotic use that delays the initiation of rehabilitation and opioid replacement therapy. We decided to implement an integrative approach to both problems. During the first step (this study), we evaluated the current care and identified areas that could be improved and in a second step developed an intervention with the goal to improve long-term outcomes.

Methods. We conducted a retrospective chart review of patients admitted to the Hospital of University of Pennsylvania with infective endocarditis (IE) and OUD from July 2016 to June 2017. Patients were identified via ICD-10 codes for infective endocarditis and substance use.

Results. Among the 669 admissions for patients with a diagnosis of OUD, 37 had IE (33 unique patients). Seventy-three percent of those required valve replacement surgery. Mean length of stay was 32 days (IQR 16, 49), 10% left against medical advice. The overall readmission rate was 55%. The most common valves involved were tricuspid with 20 (54%) and 10 aortic (27%). On discharge, only 6 (18%) of the patients were discharged on Medication Assisted Treatment (MAT), 14 (38%) were discharged with

prescriptions for narcotics, and zero for naloxone. HIV testing was not performed on 7 (21%) patients and 1 patient was HIV positive. Twenty-three (70%) patients were antibody positive for HCV, seven (21%) were antibody negative, three (9%) were not tested. *S. aureus* was the causal pathogen in 25 (76%) cases, with seven (19%) being methicillin resistant.

Conclusion. The lack of a systematic approach to management of patients with OUD admitted for endocarditis represents a missed opportunity to improve the care and outcomes of patients with OUD in regards to withdrawal, relapse prevention and harm reduction. We designed, implemented, and started to evaluate an intervention to initiate MAT in conjunction with the management of the infectious diseases complications and a standardized approach to screening these patients for HIV, hepatitis B/C and offering PrEP, HIV therapy, and/or HCV therapy where appropriate.

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1029. Outcome of Candida Graft Vascular Infection: Results From a Prospective Cohort

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Background. Candida graft vascular infections (CGVI) are rare events and little data are available in the literature. The aim of this study was to describe the characteristics and outcome of patients admitted for fungal graft vascular infections, in a reference center for CGVI treatment.

Methods. Patients admitted for a CGVI in our center from 1 January 2000 to 1 February 2018 were prospectively included. Clinical, biological, and outcome data were recorded.

Results. Two hundred patients were admitted with graft vascular infections (GVI) in our center, and 11 of them (6%) presented CGVI. They were mainly men (7; 64%), and median age was 74 years old [min-max: 39-83]. All patients had benefited from prosthetic bypass surgery prior to CGVI, and infection was considered as an early disease in six patients (55%). *Candida albicans* was found in 72% of cases. Infection was plurimicrobial in 10 patients (92%), involving *Staphylococcus aureus* in only one case and Bacille gram negatif in six (55%) cases. The management consisted in a total or partial graft replacement for five patients (45%), and surgical revision was required in four of them (30%). The empirical antifungal therapy included an echinocandin (Caspofungine) for eight patients (73%), and was changed to fluconazole or voriconazole according to antifungigram. Two patients received Amphotericin B therapy, complicated by acute kidney injury. Intensive care unit admittance was required for nine patients (82%). After the curative treatment period, antifungal therapy could not be removed in two patients and was long-continued using fluconazole. Finally, six patients (55%) died, all within the year after CGVI.

Conclusion. To our knowledge, we report here the biggest CGVI cohort. CGVI resulted in very high morbidity and mortality, requiring ICU admission for a long time. Despite multidisciplinary management involving anesthesiologists, surgeons, intensive care, and infectious disease physicians, outcome of CGVI patients remains poor.

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1030. Risk Predictive Model for Candida Endocarditis in Patients with Candidemia: A 12-year Experience in a Single Tertiary Care Hospital

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Background. Candida endocarditis (CE) is a rare but an invasive infection associated with a high mortality rate. The current understanding of this infection is poorly defined from case reports, case series and small cohorts. This study aimed to assess the risk factors for CE in patients with candida bloodstream infections (CBSI).

Methods. We conducted a retrospective analysis of all hospitalized patients diagnosed with CBSI at a large tertiary care hospital between 2002 and 2015. Data included demographics, comorbidities, laboratory parameters, and outcomes. Univariate and multivariable logistic regression analyses were used to build the predictive model.

Results. Of 1,873 cases of CBSI, 47 patients were identified to have CE. The most commonly isolated species were *C. albicans* (59.6%) followed by *C. parapsilosis* (16.2%). On univariate analysis, preexisting valvular disease (7.95, 95% CI [3.16, 20.02]) was associated with a higher risk of CE ($P < 0.05$). Factors such as isolation of

C. glabrata (0.17, 95% CI [0.04, 0.68]), hematologic malignancy (0.09, 95% CI [0.01, 0.68]), and total parenteral nutrition (TPN) (0.40, 95% CI [0.17, 0.95]) were all associated with a lower risk of CE. In multivariable modeling, the factors of valvular disease (5.05, 95% CI [1.77, 14.43]), isolation of *C. glabrata* (0.19, 95% CI [0.05, 0.80]), hematologic malignancy (0.09, 95% CI [0.01, 0.66]), and total parenteral feeding (0.43, 95% CI [0.17, 1.09]) remained significant. The final model had a C-statistic of 0.82. The crude 90-day mortality for CE was 48.9%, similar to the overall CBSI mortality of 42.1%.

Conclusion. In a population of patients with CBSI, previous valvular disease was the only factor associated with a greater risk of development of CE. Use of TPN, hematologic malignancy, and isolation of *C. glabrata* were protective factors. A predictive model may reduce the need for expensive and sometimes invasive diagnostic imaging such as trans-esophageal echocardiography, as a subset of patients may be at low enough risk for CE not to warrant them.

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1031. Nationwide Temporal Trends of Candidemia Incidence Over 18 Years Within the Veteran Health Administration System

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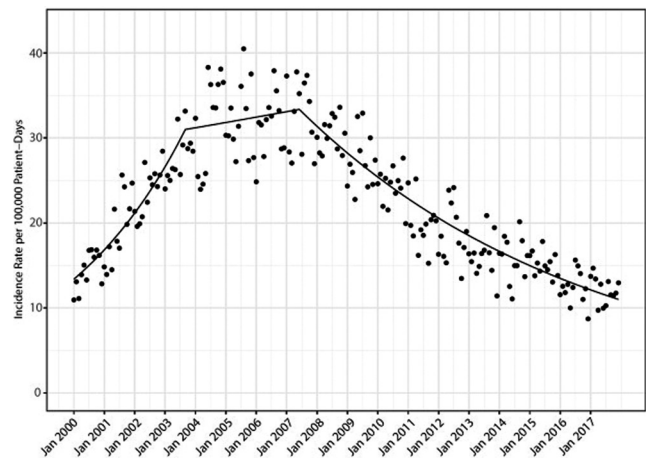
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Background. Bloodstream infection due to *Candida* spp. is common and associated with significant mortality and morbidity. Previous population-based studies in 2000s and early 2010s have suggested that the incidence of candidemia might be increasing, presumably due to widespread use of central lines and broad-spectrum antibiotics. However, recent trends of candidemia incidence have not been well described.

Methods. We conducted a retrospective cohort study of all veterans cared for in the Veterans Health Administration (VHA) system from January 2000 to December 2017 to determine the incidence of candidemia. All patients who had positive blood cultures were identified using data available in the electronic medical record data warehouse, and the number of unique patients for each month was calculated. Patient-days was used as a denominator, and the incidence rate was expressed as the number of unique patients with candidemia per patient-days for each month. Temporal trends were analyzed by joinpoint regression models to identify statistically significant changes in trend.

Results. Over the study period, 31,370 positive blood cultures for *Candida* spp. from 15,763 unique patients were identified. The mean monthly incidence rate was 22.5 per 100,000 patient-days (IQR: 15.6-28.4). Incidence rates were increasing in the early 2000s and relatively stable in the mid-2000s, followed by a sustained decline (figure). Joinpoint regression analysis revealed there were two statistically significant changes in slope, one in September 2003 (95% CI: 2/2002-1/2005) and another in 6/2007 (95% CI: 4/2006-3/2009).

Conclusion. In the VHA system, there were significant changes in temporal trends of candidemia incidence rates over 18 years, including a substantial increase in the early 2000s followed by a sustained decline in later years. The incidence rates during 2016-2017 were nearly one-third of their peak in the mid-2000s. Possible explanations for the sustained decline include prevention efforts for healthcare-associated infections, such as central-line associated bloodstream infections. Further study is needed to investigate etiologies of these changes in temporal trends to identify potential effective prevention for candidemia.



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