

within 48 hours of sample receipt. On the basis of these results, hydroxychloroquine and doxycycline were initiated with symptomatic improvement. Strain-typing demonstrated highest relatedness to the *CbuK_Q154* (group IV) strain typically seen in North America. Genotype group was independently confirmed by inference of a pattern of ORF deletion most similar to group IV (and highly related group VII). Serologic testing for *C. burnetii* confirmed the diagnosis. After 4 weeks of antibiotics, the patient underwent successful PVR with graft exchange.

Conclusion. NGS testing aided in diagnosis of *C. burnetii* CNE, enabling early targeted antimicrobial therapy. It also allowed inference of strain-level information, supporting further investigations regarding epidemiologic origins of this pathogen.

Disclosures. S. Dalai, Karius, Inc.: Consultant, Consulting fee. S. Venkatasubrahmanyam, Karius, Inc.: Employee, Salary.

155. Infective Endocarditis and Cardiac Valve Surgery During the Opioid Epidemic in North Carolina, 2007 to 2017

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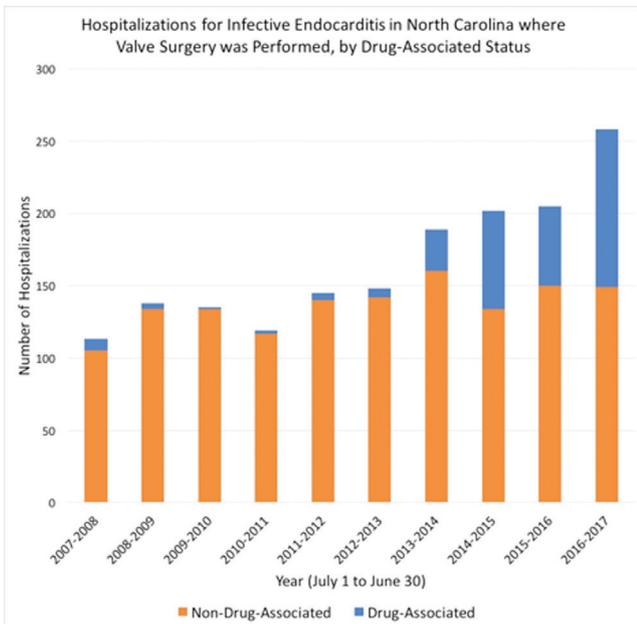
Session: 45. Cool Findings in Bacteremia and Endocarditis
Thursday, October 4, 2018: 10:30 AM

Background. Infective endocarditis (IE) associated with drug use (DA-IE) is rising nationally. North Carolina (NC), a state hard-hit by the opioid epidemic, saw an over 12-fold increase in DA-IE from 2010 to 2015. Concerns about surgery exist due to the risk of ongoing drug use and reinfection after valvuloplasty. We evaluated trends, characteristics, and outcomes of valve surgery for DA-IE, compared with IE not associated with drug use (non-DA-IE), in NC.

Methods. We analyzed the NC Discharge Database, which includes administrative data from all hospital discharges in NC. Using International Classification of Diseases codes, we identified all persons ≥18 years of age with IE from July 1, 2007 to June 30, 2017. Hospitalizations were deemed DA-IE by a diagnosis code related to illicit drug use, dependence, poisoning or withdrawal (excepting marijuana), or Hepatitis C in a person born after 1965. All others were labeled non-DA-IE. Procedure codes were queried to identify cardiac valve surgery. Year-to-year trends in surgery for IE by drug-associated status were reported. Demographics, length of stay (LOS), charges, and disposition were compared among DA-IE and non-DA-IE.

Results. A total of 22,809 hospitalizations were coded for IE. Valve surgery occurred in 1,652. Of surgical hospitalizations, 17% overall and 42% in the final study year were DA-IE. Hospitalizations for DA-IE where surgery was done increased from <10 through 2012–2013 to 109 in 2016–2017 (figure). Compared with non-DA-IE, those undergoing surgery for DA-IE were younger (median age 33 vs. 56), female (47% vs. 33%), White (89% vs. 64%), uninsured (34% vs. 11%), insured by Medicaid (39% vs. 13%), and had tricuspid valve surgery (38% vs. 11%). DA-IE had longer median LOS (27 vs. 17 days) and were less often discharged home (51% vs. 59%). For the 287 DA-IE admissions with surgery, median hospital charges were \$247,524, totaling over \$79,000,000. All comparisons were significant at $P < 0.0001$.

Conclusion. From 2007 to 2017, valve surgeries for DA-IE in NC rose over tenfold and are approaching half of all surgeries for IE. This phenomenon is an underappreciated and morbid component of the opioid epidemic that burdens hospital and state resources. Research into best practices for managing patients with DA-IE and addressing addiction in this setting is critically needed.



Disclosures. All authors: No reported disclosures.

156. Direct Detection and Quantification of Bacterial Cell-free DNA in Patients with Infective Endocarditis (IE) Using the Karius Plasma Next Generation Sequencing (NGS) Test

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Session: 45. Cool Findings in Bacteremia and Endocarditis
Thursday, October 4, 2018: 10:30 AM

Background. The variable clinical presentation of IE requires a diagnostic tool that accurately detects a wide range of organisms, including in culture-negative (CN) scenarios. A sensitive molecular diagnostic assay that quantitates pathogen DNA could be a useful tool to diagnose IE and evaluate response to antimicrobial therapy.

Methods. We prospectively enrolled 30 hospitalized adult patients evaluated for acute IE classified using the Duke Criteria. Residual plasma samples within 24 hours and/or fresh whole blood within 48–72 hours of enrollment blood culture were collected. Additional samples were collected every 2–3 days for up to 7 time points until discharge. Samples were shipped to the Karius laboratory (Redwood City, California) for testing. Cell-free DNA was extracted and NGS was performed. Human sequences were removed and remaining sequences were aligned to a curated pathogen database of over 1,000 organisms. Organisms present above a predefined statistical threshold were reported. Quantity of DNA for each reported pathogen was expressed as molecules per microliter.

Results. Of 29 patients eligible for analysis, 18 had prosthetic valves and 7 had implanted cardiac devices. Twenty-four patients had Definite IE. Twenty patients had positive blood cultures (including *S. aureus*, *S. epidermidis*, *E. faecalis*, *S. agalactiae*, *Pantoea ananatis*, *S. sanguinis*, *C. albicans*); NGS identified the same organism isolated in all 20 patients as well as *E. cloacae* complex, and *E. faecalis* in 2 of 4 CN Definite IE patients. For 1 CN patient with Possible IE, NGS identified *E. coli*. NGS and BC were negative for 4 patients with Rejected IE. NGS identified the IE etiology in patients pretreated with antibiotics up to 20 days prior to sample collection. Pathogen DNA signal was often observed in both initial and repeat plasma samples, while repeat blood cultures remained negative.

Conclusion. This novel, cell-free pathogen quantitative NGS plasma assay accurately identified causative organisms in patients with IE, even when blood cultures were negative due to pretreatment with antibiotics. Pathogen DNA, detected in plasma longer than blood culture, is a promising biomarker to aid in the diagnosis and monitoring of IE, particularly culture-negative IE.

Disclosures. P. Shah, Karius Inc.: Collaborator and Research Contractor, Salary. F. Ruffin, Karius Inc.: Collaborator and Research Contractor, Salary. H. Seng, Karius Inc.: Employee, Salary. D. Hollemon, Karius Inc.: Employee, Salary. L. Winn, Karius Inc.: Collaborator and Research Contractor, Salary. C. Drennan, Karius Inc.: Collaborator and Research Contractor, Salary. K. L. Chan, Karius Inc.: Employee, Salary. H. Quach, Karius Inc.: Employee, Salary. T. Blauwkamp, Karius Inc.: Employee, Salary. G. Meshulam-Simon, Karius Inc.: Employee, Salary. D. Hong, Karius Inc.: Employee, Salary. V. G. Fowler Jr., Merck, Cerexa/Actavis, Pfizer, Advanced Liquid Logis, NIH, MedImmune, Basilea, Karius, Contrafact, Regneron, Genentech, Affinergy, Locust, Medical Surface, Inc., Achaogen, Astellas, Arsanis, Bayer, Cubist, Debiopharm, Durata, Grifols, Medicines Co, Novartis: Collaborator, Consultant and Scientific Advisor, Consulting fee, Research grant and Research support.

157. Reducing Blood Culture Contamination Rates Through the Use of a Red Top Tube Discard

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Session: 45. Cool Findings in Bacteremia and Endocarditis
Thursday, October 4, 2018: 10:30 AM

Background. Septicemia is a major cause of death in the United States and accounts for up to \$16.7 billion in annual health care expenses. Blood culture is the gold standard for laboratory diagnosis of bacteremia and resultant septicemia; however, false-positive blood cultures hinder the accurate determination of true bacteremia with often serious implications. The goal of this study was to determine the efficacy of collecting a 1 mL discard in a red tube prior to blood culture collection and to assess its effectiveness in reducing contamination rates in Hartford Hospital Emergency Department (HHED).

Methods. During the months of June to December 2017 blood cultures were collected by the phlebotomy team using ChloraPrep (chlorhexidine) as the sole disinfecting agent. Blood cultures consisted of BD BACTEC plus Aerobic/F and BD BACTEC Lytic/10 Anaerobic drawn at the same time and monitored on BD BACTEC FX instrument for 5 days. Prior to collecting blood cultures 1 mL of blood was collected in a red top tube and discarded. Monthly and overall contamination rates were then compared with 2016 in which a red top discard tube was not used.

Results. During June to December 2016, there were a total of 9,576 blood cultures collected with a total of 178 contaminants and an overall contamination rate of 1.9%. During June to December 2017, there were a total of 9,133 blood cultures collected with a total of 73 contaminants and an overall contamination rate of 0.8%. During both