**Conclusion.** Within an immunocompromised patient population, differences in organism identification between three commercially available RDT panels did not impact theoretical antibiotic prescribing.

**Disclosures.** J. Kristie Johnson, PhD, D(ABMM), GenMark (Speaker’s Bureau) Kimberly C. Claeyws, PharmD, GenMark (Speaker’s Bureau)

**1025. Prediction of Intravenous Immunoglobulin Resistance and Coronary Artery Dilatation in Kawasaki Disease: a Multicenter Study from Oman**

Fatma Al Mwaiat, resident; Zaid Alhinaia, MD FAAPF FIPIDS; Safiya AlAbrawi, senior consultant pediatric hematologist; Ashlan AL marami, MD, MSc; Reem Abdwani, Rheumatology associated professor; Khalifan Al Senidi, pediatric cardiology senior consultant; Omea, Masqat, Masqat, Oman; Sultan Qaboos University, Muscat, Masqat, Oman; MOH, Masqat, Masqat, Oman; SQU, Masqat, Masqat, Oman; SQUH, Masqat, Masqat, Oman

**Session:** P-58. New Approaches to Diagnostics

**Background.** Prediction of intravenous immunoglobulin (IVIG) resistance and coronary artery dilatation continues to be a challenge in the management of Kawasaki disease. Significant differences exist among different populations.

**Methods.** Children <13 years of age who presented to the two main tertiary care hospitals in Oman (Royal Hospital and Sultan Qaboos University Hospital) between 2008 and 2019 with a diagnosis of Kawasaki disease were included. Diagnosis was confirmed and clinical, laboratory and echocardiography data was systematically collected and checked for accuracy. The primary outcome was the presence of IVIG resistance or coronary artery dilatation at the 6-week follow-up. Bivariate analysis was used to identify significant predictors of the primary outcome, followed by multivariable logistic regression to determine independent predictors. The Muscat Index of Kawasaki disease Severity (MIKS) score was created based on the results.

**Results.** 156 children with Kawasaki disease were included. Median age was 2.1 years (IQR 0.9-3.8), and 64% were males. All patients received IVIG, 26% (17%) received steroids, and one received infliximab. Coronary dilatation was identified in 41 (26%) patients on initial echocardiogram, and 26 (18%) at the 6-week follow-up visit. Variables significantly associated with the primary outcome were age ≤15 months (P=0.031), hemoglobin (P=0.009), WBC count (P=0.002), absolute neutrophil count (P=0.006), and CRP ≥150 mg/L (P=0.015). These variables in addition male gender (P=0.058), ALT >80 IU/L (P=0.10) and serum sodium (P=0.10), were entered into multivariable logistic regression. A predictive model based on CRP ≥150 mg/L (LR=2.2, P=0.049), male gender (LR=2.1, P=0.095) and WBC (LR=1.1, P=0.017) resulted, and it was used as basis for the MIKS score (Table 1). The MIKS score performed favorably to the Kobayashi score in its sensitivity to predict the primary outcome and its separate components (Table 2). Combining the MIKS score with other high-risk criteria had a sensitivity of 95% in predicting the primary outcome and a specificity of 56%.

**Table 1. Calculation of the Muscat Index of Kawasaki disease Severity (MIKS) score**

| Criteria | Score |
|----------|-------|
| C-reactive protein ≥150 mg/L | 2 |
| WBC |   |
| ≥13.5 x10^9/L | 1 |
| ≥19 x10^9/L | 3 |
| Male gender | 2 |
| Maximum score | 7 |

**Conclusion.** Open-ended, plasma-based mcDNA NGS provides a rapid, non-invasive test to diagnose diverse clinical manifestations of zoonotic infections such as Q fever and Brucellosis among competing broad differential diagnoses. Furthermore, these cases highlight the potential of the KT to diagnose infections caused by fastidious/unculturable pathogens with cryptic clinical presentations.

**Disclosures.** Nicholas R. Degner, MD, MPH, MS, Karius Inc. (Employee, Shareholder), Ricardo Castillo-Galvan, MD MPH, Karius Inc. (Employee), Jose Alexander, MD, D(ABMM), FCCM, CIC, SM, MB(ASCP), BCMAS, Aparna Arun, MD, PhD, Macintyre, DO, Karius Inc. (Employee), Bradley Perkins, MD, Karius Inc. (Employee) Asim A. Ahmed, MD, Karius, Inc. (Employee) Matthew Smollin, PharmD, Karius Inc. (Employee)

**1026. Following the Hoof Prints: Detecting Coxiella and Brucella infections with A Plasma-based Microbial Cell-Free DNA Next-generation Sequencing Test**

Nicholas R. Degner, MD, MPH, MS; Ricardo Castillo-Galvan, MD MPH; Jose Alexander, MD, D(ABMM), FCCM, CIC, SM, MB(ASCP), BCMAS, Aparna Arun, MD, PhD, Macintyre, DO; Bradley Perkins, MD, Asim A. Ahmed, MD, Matthew Smollin, PharmD; Karius Inc., San Francisco, California; “Karius, Inc., Franklin, Tennessee; “Karius, Redwood City, California; “Karius, Redwood City, CA

**Session:** P-58. New Approaches to Diagnostics

**Background.** Coxiella burnetii and Brucella spp. are zoonotic bacterial pathogens responsible for Q fever and Brucellosis, respectively. Both pathogens have a global distribution and Brucellosis is the most common zoonosis in the world. However, the CDC detected only 80-120 cases of human brucellosis and ~150 cases of Q fever annually. The diagnosis of these infections can be limited by: (1) their difficulty to culture; (2) the insensitivity and nonspecificity of serology; (3) the clinical overlap with other infections; and (4) the unreliability of epidemiological exposure history for these zoonoses. Unbiased microbial cell-free DNA (mcDNA) next-generation sequencing (NGS) offers a potential solution to overcome these limitations.

**Methods.** The Karius Test™ (KT) developed and validated in Karius’s CLIA certified/CAP accredited lab in Redwood City, CA detects mcDNA in plasma. After mcDNA is extracted and NGS performed, human reads are removed, and remaining sequences are aligned to a curated database of > 1500 organisms. McDNA from organisms present above a statistical threshold are reported and quantified in molecules/mL (MPM). KT detections of Coxiella and Brucella were reviewed from August 2017 - present; clinical information was obtained with test requisition or consultation upon result reporting.

**Results.** KT detected 8 cases of Coxiella burnetii (1735 MPM +/- 3000) and 5 cases of Brucella melitensis (avg 296 MPM +/- 223) (Table 1), representing approximately 1-2% of all detections in the US during this period. All of the Coxiella detections were in adults (100%), with 5 cases of fever of unknown origin and one case of endocarditis and one case of endovascular graft infection. Brucella detections occurred in 3 adults and 2 children (60% male), 3 with exposure to unpasteurized dairy and included 3 cases of spine infection (2 vertebral osteomyelitis, 1 epidural abscess).

**Table 1. Coxiella burnetii and Brucella melitensis detections by the Karius Test™**

| Coxiella burnetii | Brucella melitensis |
|------------------|---------------------|
| MPM +/- (n=8)    | MPM +/- (n=5)       |
| 1735 +/- 3000    | 296 +/- 223         |

**Conclusion.** The Karius Test™ enables the detection of Coxiella burnetii and Brucella melitensis in plasma, providing an alternative diagnostic strategy to standard laboratory approaches. KT has the potential to be used in the evaluation of cases with atypical presentations and to guide antibiotic treatment.
was performed to evaluate the expected impact of the BCID-GP panel on the time to organism identification, AST results, and optimization of antimicrobial therapy.

**Results.** A total of 80 patients were included in the final analysis (Table 1). *S. epidermidis* was the most common bacteria identified, followed by *S. aureus*, and other coagu- lase-negative staphylococci. Thirty-nine patients with staphylococci (48.8%) had the mecA gene detected and 2 patients with *E. faecium* had the vanA gene detected. The BCID-GP panel saved a mean of 24.4 hours (h) to identification and 48.3h to susceptibility testing compared to standard methods across all patients. In 38 patients (47.5%), the BCID-GP panel could have enabled an earlier change in antibiotic therapy. Table 2 highlights opportunities to optimize antimicrobial therapy 53.4h earlier for 16 (20%) patients with organisms expressing AMR genes, 29.2h earlier for 8 (10%) patients infected with organ- isms, such as streptococci, with very low resistance rates, and to stop antimicrobial therapy 42.9h earlier for 14 (17.5%) patients with contaminated blood cultures.

**Table 1. Patient demographics and co-morbidities.**

| Variable | Total (N=80) |
|----------|--------------|
| Age (Mean) | 54.1 |
| Male – No. (%) | 43 (53.8) |
| Race/Ethnicity – No. (%) | 43 (53.8) |
| White | 35 (43.8) |
| Black | 2 (2.5) |
| Hispanic/Latino | 43 (53.8) |
| Immunosuppression – No. (%) | 6 (7.5) |
| Solid malignancy | 4 (5) |
| Hematologic malignancy | 7 (8.9) |
| SOT | 3 (3.8) |
| HSTC | 4 (5) |
| Diabetic – No. (%) | 32 (40) |
| Cardiovascular disease – No. (%) | 26 (32.5) |
| Chronic lung disease – No. (%) | 11 (13.8) |
| CKD – No. (%) | 12 (15) |
| ESRD – No. (%) | 7 (8.8) |
| Cirrhosis – No. (%) | 3 (3.8) |
| IDU – No. (%) | 1 (1.3) |
| Mechanical ventilation – No. (%) | 15 (18.8) |
| ECMO – No. (%) | 1 (1.3) |
| Trauma at time of admission – No. (%) | 8 (10) |
| Burn at time of admission – No. (%) | 1 (1.3) |
| Pitt Bacteremia Score (Mean) | 2.46 |

**Table 2. Time of antibiotic change and time saved.**

| Potential change to antibiotics | No. of patients | Mean time saved (hours) |
|-------------------------------|----------------|------------------------|
| Stop for earlier ID of contaminant species | 14 | 42.9 |
| Change GP antibiotic based on presence or absence of resistance gene | 16 | 53.4 |
| Change NP antibiotic based on earlier ID of Streptococcus | 29 | 2.9 |

**Conclusion.** The BCID-GP panel could have enabled earlier optimization or stopping of antibiotics in many patients with significant time savings compared to standard laboratory methods.

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**1029. Torus Synesthesia Nucleic Acid Analysis Platform for Fast, High Multiplex Analysis of Nucleic Acids With Single-Nucleotide Discrimination Level Tyler Rockwood, n/a; Andrew Sullivan, n/a; Jahnnavi Gandhi, n/a; Sarah Gruszka, n/a; Brian Turczyk, PhD; Dmitry Khodakoff, PhD; 2TORUS BIOSYSTEMS, INC., Cambridge, Massachusetts

**Session:** P-58. New Approaches to Diagnostics

**Background.** Emergency departments (EDs) serve as sentinel settings for diagnosing sexually transmitted infections (STIs), including HIV and syphilis. We aimed to assess performance and patient acceptability of a point-of-care (POC) test, the Chembio Dual Path Platform (DPP®) HIV-Syphilis Assay, in an urban ED in Baltimore.

**Methods.** 170 patients were enrolled via convenience sampling from Oct 2019 – March 2020 and Jan 2021 – June 2021. Patients eligible were ≤ 70 yrs, men who have sex with men, pregnant without care, had STI concerns, or history of drug use. Subjects received standard of care (SOC) HIV and syphilis testing using institutional labora- tory algorithms. Subjects were then tested with the finger-stick POC test and completed a survey, both before and after the POC test to assess subjects’ attitudes toward the POC test.

**Results.** Comparing the SOC and POC results, 165/170 (97.1%) were concordant. 3 syphilis POC results were false negative, but reported successful treatment over 10 days prior to enrollment (treponemal antibody remains after treatment). 1 HIV result was false negative and I was false positive. Overall the specificity and sensitivity of the HIV POC test were 96.8% (95%CI: 83.3%, 99.9%) and 99.3% (95% CI: 96.1%, 100%), and for syphilis were 85.7% (95%CI: 63.7%, 97.0%) or 100% (95% CI: 81.5%, 100%), if excluding 3 persons having been successfully treated, and 100% (95% CI: 97.6%, 100%) respectively.

The pre-test survey found 67% and 77% of participants were comfortable with a finger-stick test and agreed the POC test result would be as good as the SOC test result, which increased to 96% and 86% in the post-test, respectively. (p < 0.05). At post-test, 86% reported they would feel confident to perform this test at home and 81% would use it at least once per year if it were available. 97% reported they were more likely to seek treatment if receiving a positive result during their ED visit and 91% reported it would reduce their stress/anxiety if receiving a negative test result in the ED.

**Conclusion.** Our findings demonstrated satisfactory performance and high pa- tient acceptability of the Chembio DPP® HIV-Syphilis Assay. Given the test is FDA approved, implementation studies are needed to determine whether adoption of this POC test will benefit patients and be consistent with Era.

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