Prospicetive Pilot Evaluation of the BioFire® FilmArray® Bone and Joint Infection (BJI) Panel on Synovial Fluids at a Large County Hospital
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ABSTRACT

Background: Septic arthritis (SA) is a serious infection associated with significant orthopedic morbidity that requires rapid diagnosis and early initiation of therapy to preserve joint function.1,2 Accurate diagnosis of SA is challenging because the signs, symptoms and common laboratory findings overlap with other common joint pathologies such as rheumatoid arthritis (RA) and gout.2 The sensitivity of synovial fluid culture for SA is between 60-72%.3 Thus, there is a need for a rapid molecular test that could accurately rule out joint infection and thus reduce the use of unnecessary antibiotics in patients with non-infectious joint pathologies.2

Methods: The FilmArray BJI Panel is a rapid test capable of identifying 32 bacteria, fungi, and antimicrobial resistance markers in approximately 1 hour.4

OBJECTIVES

To evaluate the performance and clinical potential of the FilmArray BJI Panel on synovial fluid specimens from patients with suspected joint infection

PILOT FILMARRAY BJI PANEL PATHOGENS

- **Materials and Methods:**
  - 45 consecutively sampled synovial fluid specimens with bacterial cultures ordered at LAC+USC Medical Center between November 2016 and March 2017.
  - Performance of the FilmArray BJI Panel was compared to conventional culture and discrepancy PCR analysis was performed in this study.

INCLUSION CRITERIA

- Synovial fluid specimens left over from standard of care testing for suspected bone or joint infection, as defined by a physician-ordered bacterial or fungal culture on a synovial fluid specimen.
- Specimens consisted of native synovial fluid (i.e. not diluted in transport media, not collected by swab, etc.).
- Specimens held at room temperature for 4 hours or refrigerated (4°C) for ≤10 days before enrollment.
- At least 0.5 mL of specimen remained after standard of care testing and available for study use.

CONCLUSIONS

- The FilmArray BJI Panel is a novel method for the rapid detection of microorganisms directly from synovial fluid.
- Testing data collected from this pilot study, along with data from other sites, will be used to optimize the finalized FilmArray BJI reagent pouch for use in a future prospective clinical evaluation.
- The majority of synovial fluids collected for suspected septic arthritis, drawn in the emergency department. The FilmArray BJI Panel may have potential clinical utility in rapidly identifying those patients without joint infection that could be discharged without antibiotics.
- The high negative predictive value of the panel (100%) could also have utility in facilitating more timely discontinuation of unnecessary empiric therapy.
- The subjects with clinical septic arthritis on antibiotics at the time of collection, all had microorganisms detected by the FilmArray BJI Panel. These pathogens were detected by either subsequent culture and/or discrepancy molecular methods.
- Additional studies with larger sample sizes are needed to further characterize the FilmArray BJI Panel sensitivity and positive predictive value.
- The FilmArray BJI Panel is technically simple to perform and with turnaround time averaging approximately one hour.

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- Data presented are from assays that have not been cleared or approved for diagnostic use.
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References