EV0499
ePoster Viewing
Diagnostic bacteriology – non-culture based, including molecular and MALDI-TOF

Evaluation of the IRIDICA system to diagnose prosthetic implant infection

Deborah Gascoyne-Binzi*[1], Robert O'hara[2], Peter Bobak[3], Paul Harwood[4], Nicholas Foster[1], Mark H. Wilcox[5], Jonathan Sandoe[6]

[1]*Leeds Teaching Hospitals NHS Trust, Department of Microbiology, Old Medical School, Leeds, United Kingdom*

[2]*The University of Plymouth, Department of Microbiology,, Plymouth, United Kingdom*

[3]*Leeds Teaching Hospitals NHS Trust, Leeds, United Kingdom*

[4]*Leeds Teaching Hospitals NHS Trust, Leeds Major Trauma & Limb Reconstruction Unit, Leeds, United Kingdom*

[5]*Leeds Teaching Hospitals and University of Leeds, Microbiology, Old Medical School, Leeds, United Kingdom*

[6]*Leeds Teaching Hospitals and University of Leeds, Department of Microbiology, Old Medical School, Leeds, United Kingdom*

Background: Infections of prosthetic implants are difficult to diagnose. Problems of poor sensitivity and contamination require collection of multiple surgical samples for microbiological culture. In our laboratory, up to 7 culture plates and broths are used per sample. Two samples growing the same pathogen are required for the result to be indicative of infection. A more sensitive method for detecting infection could potentially reduce the workload associated with diagnosis of suspected implant infection.

The IRIDICA BAC assays (Abbott Molecular) uses a semi-automated platform, including specimen extraction, PCR and identification using electro-spray ionization mass spectrometry (ESI-MS) to detect and identify bacteria, antimicrobial resistance genes and candida from clinical samples. In this study (conceived as part of the IRIDICA Early Access Programme) we compared routine microbiological culture with the IRIDICA BAC sterile fluid and tissue (SFT) assay.

Material/methods: Design: non-interventional clinical test validation study. Surgical samples obtained from patients with suspected implant infection were collected after routine microbiology work up between August 2014 and May 2015. Prosthetic material from orthopaedic, spinal surgery and trauma departments and normally discarded, was sent for sonication and microbiological culture. Individual samples and sonicates were anonymized and stored at -20 degrees until the IRIDICA assay was performed. Samples were processed with the IRIDICA assay after the routine culture results had been reported and the results were not communicated back to the clinicians.

Samples were processed using the IRIDICA BAC SFT assay according to the manufacturer's instructions. The results were compared with culture data from the laboratory system at the end of the study.

Results: A total of 25 implants and 41 tissues samples collected during surgery were received from 20 patients. 100 samples of synovial fluid and associated intra-operative tissue samples were collected

from 38 further patients. The sensitivity of the IRIDICA assay compared to culture of the same sample was 89% (49/55), specificity 73% (82/112). Applying the rule that positive episodes require the detection of the same pathogen in at least 2 samples (after removal of singleton samples), the sensitivity was 100% (14/14), specificity 85% (23/27). The IRIDICA assay identified one bacterium additionally to that obtained by culture in 2 episodes, misidentified a coryneform and also detected a clostridium that had been cultured previously (1 episode) and did not consistently identify the components of a complex mixed infection (1 episode). Episodes detected by IRIDICA only were CNS (3) and *P.acnes* (3).

Conclusions: Although the numbers of samples included in this study were low, the IRIDICA assay produced data consistent with that obtained from the microbiological data. The IRIDICA assay may be more sensitive; bacteria were identified by IRIDICA (in 2 or more samples), either additionally to cultured bacteria or where no growth had been recorded.