P0521
Paper Poster Session
Bone and prosthetic joint infection

Molecular analysis of pooled bead-milled intraoperative samples from periprosthetic joint infections using Curetis' Unyvero i60 ITI

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Background: The diagnosis of prosthetic joint infection (PJI) is still a challenge to the microbiologist. While implant sonication and the extended culture of beadmilled periprosthetic tissue samples have improved the sensitivity and specificity, the turn around time of the culture of fastidious organism is on ongoing challenge. The use of molecular techniques can allow the early recognition of causative agents but the sole identification of the agent is insufficient to guide the antimicrobial regimen in the absence of antimicrobial susceptibility data. Here we evaluate the use of the Unyvero i60 ITI, a highly multiplexed molecular platform CE-IVD marked for the diagnosis of prosthetic joint infections that allows the detection of both the major pathogens and the determinants of antimicrobial drug resistance directly from the sample, allowing same day implementation of adequate therapy. Using beadmilled suspensions from periprosthetic tissue samples, we compared the performance of the Unyvero i60 ITI on multiple samples and on a pool of those samples.

Material/methods: The study took place in the Paris University Hospital reference center for complex bone and joint infections (Hôpital Raymond Poincaré, Garches, France). Samples from six prospective patients were included, as well as frozen aliquots from ten retrospective patients treated in 2015 for septic hip or knee arthroplasty. Four to five samples collected at the time of debridement are beadmilled in DNA-free water and subjected to extended culture on solid and blood culture automated media. We performed the Unyvero analysis on 500µl of the suspension from these individual samples and on a pool of 500µl from each of the samples (total 2 to 2.5ml) in the course of the same run. The implemented configuration allowed the testing of all six samples in a simultaneous run.

Results: 91 samples from 16 procedures in 15 patients were evaluated. The extraction, amplification and hybridization stages were flawless in 86/91 cases (94.5%), with two cases of invalid extraction (2.2%) and three cases of failure in one of the 8 PCR channels (3.3%). The system detected PJI caused by *S. aureus* (n=3), Methicillin resistant Coagulase negative staphylococci (n=2),

Pseudomonas aeruginosa (n=2), *Escherichia coli* (n=1), *Enterococcus faecalis* (n=1) and *Finegoldia magna* (n=1), The sensitivity of the pooled samples (10/16) was equivalent to that of the individual samples in determining the causative agent of PJI.

Conclusions: The analysis of pooled samples on a single Unyvero cartridge does not alter the sensitivity of the device and can be a substitute to the individual analysis of multiple samples, limiting analytical costs and optimizing the use of the instrument's slots.