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ePoster Session

Diagnosis of bone and joint infections

Rapid microbiological diagnosis of orthopaedic implant-associated infections by MALDI-TOF of sonication fluid

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Background: Infections associated with orthopedic devices occur less frequently than aseptic failure (AF), but represent the most devastating complication with high morbidity and substantial cost. An accurate and rapid diagnosis of Orthopedic Implant-Associated Infections (OIAI) is crucial for the treatment success. Current diagnostic methods in OIAI are insufficient. Consequently, research and development of new diagnostic methods aim to improve the diagnostic accuracy and speed of detection. We assessed MALDI-TOF of sonication fluid from positive blood culture bottles and compared it with periprosthetic tissue cultures and sonication fluid culture for the diagnosis of OIAI.

Material/methods: Patients in whom an orthopedic hardware was explanted for any cause in Complejo Hospitalario de Navarra, (Pamplona, Spain) were prospectively included from 4/2015 to 8/2015. The diagnostic procedure included culture of periprosthetic tissues and sonication of the removed devices, followed by conventional culture of the sonication fluid. In addition, 10 ml of sonication fluid were inoculated into each aerobic and anaerobic BD BACTEC™ Plus blood culture bottles with antimicrobial removal systems and incubated in the automated blood culture system for 5 days. Lysis and centrifugation procedure was performed for direct MALDI-TOF from positive blood culture bottles. OIAI and AF were defined as previously described (JCM 2015, Portillo).

Results: Of 47 devices, 11 (23%) were diagnosed with OIAI and 36 with AF (77%). All patients with OIAI received antibiotics previously to surgery. In OIAI, the overall sensitivity of tissues, sonication fluid cultures and MALDI-TOF of sonication fluid was 27% 64% and 64%, respectively ($p < 0.05$), whereas the specificity of the 3 techniques was 100%. All OIAI cases detected by MALDI-TOF of sonication fluid were diagnosed on the first day of incubation whereas all sonication fluid cultures and tissue cultures were still negative ($p < 0.05$). In addition, no misidentifications were reported.

Conclusions: MALDI-TOF of sonication fluid from blood culture bottles is a reliable and rapid method for the diagnosis of OIAI.