

P2516 Comparison of sonication and dithiothreitol method for the diagnosis of orthopaedic implant-related infections

Matthaios Bakalagos¹, Antonios Stylianakis*², John Vlamis¹, Spyridon Kamariotis², Athanasios Adamopoulos², Eleni Maggou², Nikolaos Sipsas³, Spiros Pneumaticos¹

¹ 1. 3rd Orthopaedic Department, University of Athens, Athens, Greece, Greece, ² Microbiology dpt, KAT hospital, Greece, ³ 3. Infectious Diseases Unit, Pathophysiology Department, Laikon General Hospital, University of Athens, Athens, Greece

Background: Sonication has been reported to improve microbiological diagnosis of orthopaedic implant-associated infections (OIAI). Nonetheless the necessary equipment is not available in all laboratories. Recently dithiothreitol (DTT) was used for diagnosis of OIAI. The aim of this study was to evaluate the effectiveness of using DTT in comparison to sonication method for detecting alive microorganisms originated from biofilm causing OIAI.

Materials/methods: Between March 2017 and September 2018, a prospective cohort study was conducted at our institution. A total of 51 patients were enrolled in the study. Patients were divided into 2 groups: group A included 31 patients with high suspicion of infection undergoing implant removal (study group) and group B included 20 patients undergoing scheduled explantation of hardware, such as syndesmotic screws (control group). The explanted hardware was aseptically removed in the operating room, divided into two equal-length segments and transported to the microbiology laboratory into two separate sterile air-tight containers. In the first container the removed implant segment was sonicated as described previously (Trampuz, NEJM 2007), while in the second one it was immersed in a solution of 0.1%w/v DTT and shaken for 20min. Both fluids were cultured in the proper conditions and nutrition media, quantitatively. The plates were daily examined for two weeks and the number of any distinct colony morphology was recorded.

Results: In group A, DTT-fluid cultures were positive in 22 of 31 patients (71%), while in group B sonication-fluid cultures were positive in 24 of 31 patients (77%). The positive DTT-fluid cultures revealed the same microbial species with the respective sonication-fluid cultures. Comparisons of individual diagnostic tests were not considered significant ($p > 0.05$), according to the McNemar test. In group B (control group) both DTT and sonication-fluid cultures were negative in all patients.

Conclusions: Our results showed that DTT method is non-inferior to sonication method and may add important insight into the diagnosis of OIAI. Although sonication has been shown to improve microbiologic diagnosis of OIAI, unlike DTT, this procedure presupposes the existence of the necessary laboratory equipment. DTT represents a new, non-expensive and readily available diagnostic method with clinically acceptable diagnostic values for detecting implant-associated infections.

