**TITLE:** FREQUENCY AND ANTIMICROBIAL SUSCEPTIBILITY OF MICROORGANISMS CULTURED FROM PROSTHETIC DEVICES SONICATION FLUID.

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**ABSTRACT:**

Culturing fluids obtained after sonication of removed orthopedic prostheses is useful for the diagnosis of infections in prosthetic devices. Sonication allows the analysis of the entire prosthetic surface and quantification of microorganisms present. Knowledge of the frequency and antimicrobial susceptibility profile of microorganisms may help to guide empirical therapy. The present study aimed to verify the frequency and the antimicrobial susceptibility of microorganisms cultured from prosthetic devices sonication fluid. A database search for sonication fluid cultures, performed during the period from 01/17/16 to 08/05/19, was performed. Pathogen frequencies by implant topography and antimicrobial susceptibility rates were calculated. Sonication fluid samples were cultivated on sheep blood agar, chocolate agar, thioglycolate medium and Bactec Anaerobic Plus vial for 14 days. Species identification was achieved using MALDI-ToF MS (Bruker Daltonics). A total of 506 samples were cultivated during the study period. Positivity was detected in 296 samples (58.4%). Concerning the original location of the implants that were culture positive, 77 (26%) were knee prosthesis, 41 (13.8%) were hip prosthesis, 11 (3.7%) were shoulder prosthesis and 167 (56.4%) were other types of orthopedic prosthetic devices. The most frequent microorganisms were S. aureus (24.5%), S. epidermidis (19.5%), other coagulase negative Staphylococci (14.7%) and Cutibacterium acnes (8.5%). In other types of orthopedic materials, a higher frequency of Enterobacterales (17.7%) was observed, compared to knee (10.3%), hip (13.5%) and shoulder (0%) prosthesis. Concerning bacterial count, in 47.9% of positive cultures, the number of CFU was < 10 CFU/mL. C. acnes was isolated, with a count < 10 CFU/mL in 78% of all cases. Of note, rare pathogens , like Brucella sp. and Campylobacter fetus were detected in cultures of sonicated fluid from knee prosthesis. S. epidermidis were highly susceptible to rifampicin (94.5%), teicoplanin (95.8%) and vancomycin (100%), but a low oxacillin suceptibility rate (35.7%) was observed. Among 92 S. aureus, 26.8% were MRSA. Most of them were rifampicin susceptible (90.3%) and none of the isolates were resistant to vancomycin or teicoplanin. In conclusion, we found in our study pathogen frequencies similar to those observed in other studies. In our casuistic, the 10 CFU/ml cutoff, described in the original publication of the sonication method, must be reviewed.

**Keywords:** cultures, count, orthopedic, prostheses, sonication.

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