EVALUATION OF A NEW MULTIPLEX PCR ASSAY OF THE SONICATED IMPLANT FOR DIAGNOSIS OF PROSTHETIC JOINT INFECTION


Objectives
To evaluate the usefulness of a new molecular biology technique (Unyvero i60 ITI, Curetis-Leti®) for microbiological diagnosis of Prosthetic Joint Infection (PJI) and to compare it with culture of the sonicated implant.

Methods
Prostheses from patients who underwent implant removal because of PJI were sent to the Microbiology Laboratory for culture. Samples were then covered with phosphate sterile tampon (PBS) in a rigid plastic container and sonicated for 5 minutes in a low power sonicator. Sonicate was then centrifuged at 3000xg for 20 minutes. Supernatant was then discharged and sediment was resuspended in sterile PBS. Quantitative culture was performed inoculating 10 microliters in different culture media. Plates were incubated for 7 days and isolated organisms were quantified and identified. Susceptibility testing was also performed. Alternatively, 180 microliters of sonicate were used to carry out a multiplex PCR (Unyvero i60), able to detect the most frequent etiologic agents of PJI, as well as their main mechanisms of resistance to antibiotics. A statistical study for the comparison of the sensitivity, specificity, positive and negative predictive value of both techniques was performed using Epi Info 3.5.4 software.

Results
Thirty-three prostheses from 27 patients were analyzed (1.22 prostheses/patient). Ten patients were diagnosed of PJI. The values obtained from the analysis of the data showed that sensibility, specificity and predictive values were slightly higher for Unyvero i60 system than for traditional culture, for both samples and patients analysis. Regarding antimicrobial susceptibility, 7 resistance mechanisms were detected from 4 samples: 1 CTXM beta-lactamase, 3 aminoglycoside resistance (1 aac A4 and 2 aac 6'/aph 2'') 2 mecA and 1ermA genes. The results obtained were accurate with conventional antimicrobial susceptibility testing.

Conclusion
Unyvero i60 system has slightly better results compared with conventional culture of the sonicated prosthesis for the diagnosis of PJI. The availability of the results in 5 hours represents a faster result than conventional culture methodology, and could be useful for the diagnosis of PJI, including detection of resistance mechanisms that can be of interest for the proper management of these patients.

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