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HIGH VANCOMYCIN RESISTANCE AMONG BIOFILMS PRODUCED BY *STAPHYLOCOCCUS* SPECIES ISOLATES FROM CENTRAL VENOUS CATHETER

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Introduction: *Staphylococcus* spp. is a major concern to the medical community, mainly in medical devices, such as central venous catheter (CVC). These may be due the crucial step in the pathogenesis of these infections is the formation of stable biofilm on the surface of the implanted biomedical device and it is considered an important virulence factor of staphylococci. Biofilm production is an important microbial way to escape of the host defenses and antimicrobial therapy. Vancomycin is the therapeutic choice for treatment of methicillin-resistant Staphylococci infections, but over the last decade there has been emerged isolates with reduced susceptibility to glycopeptides around the world. In light of this, vancomycin has been used largely for the treatment of methicillin-resistant staphylococci infections.
Objective: To determine the minimal inhibitory concentration (MIC) and minimal biofilm eradication concentration (MBEC) for 82 staphylococci species isolates from CVC.
Materials and Methods: We determined MIC against vancomycin by microtiter plate assays as recommended by the CLSI guideline and MBEC according to Moskowitz *et al.* (2004) and Stepanovic *et al.* (2007) with few modifications. The variations introduced herein made the procedure more compatible with routine and regulations of clinical microbiology laboratory practices.
Results and Discussion: Our results demonstrated that in biofilm mode of grown the vancomycin resistance is higher than planktonic mode of grown. Among isolates strong and moderate-biofilm-producing was observed the occurrence of the higher ratio MBEC/MIC (~64 for a strong-biofilm-producing *S. epidermidis* and two moderate-biofilm-producing isolates, one *S. epidermidis* and one *S. capitis subsp capitis*). Among weak-biofilm-producing, only one *S. sciuri* isolates showed a ratio (MBEC/MIC) equal to 16. Strong and moderate-biofilm producing *S. aureus* isolates (one and two isolates, respectively) showed ratio values higher than weak-biofilm-producing *S.aureus* (10 isolates). This shown that the ability to produce biofilm makes an important barrier to the antimicrobial diffusion into biofilm. Among *S.epidermidis* isolates (n=55) were observed high rate MBEC/MIC values. This is, basically, because the isolates showed are strong (16 isolates) and moderate (20 isolates) biofilm producing. It is known that *S. epidermidis* the most agents associated with CVC infections.
Conclusion: In conclusion, the correct antimicrobial therapy for the treatment of infections biofilm-related appears to require the application of specific biofilm assays, once that antimicrobial susceptibility testing based on MIC values can not be accurate to determine the exact susceptibility of bacterial biofilms. Here, we have alerted to the fact that the correlation between MIC and MBEC is poor. It is crucially important to suspect, mainly in CVC infections, the occurrence of bacterial biofilm production.
Approval for the study was obtained from ethics committee: CONEP/HCPA and from Office for Human Research Protections, with Institutional Review Board.

References:

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