TITLE: COAGULASE-NEGATIVE STAPHYLOCOCCI: 20 YEARS STUDY OF ANTIMICROBIAL RESISTANCE PROFILE IN ISOLATES OF HEMOCULTURE OF A UNIVERSITY HOSPITAL

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ABSTRACT:
Coagulase–negative staphylococci (CNS) are normal resident microbes of human skin, recognized as opportunistic organisms. They are the most frequently isolated organisms from clinical materials, and the main cause of nosocomial bacteremia. CNS infections are complex, and may involve production of biofilms, which contribute to a greater adhesion and virulence of the strain. Therefore, the aim of this study has been to establish the agr locus, the susceptibility of biofilm–producing *S. epidermidis* specimens to antimicrobial agents, and to analyze the clonal profile of blood culture specimens from inpatients at the UNESP Hospital das Clínicas in Botucatu, Brazil, along a 20–year period. Detection of biofilm–related genes (*icaA, icaB, icaC,icaD*, *bhp* and *aap*) by polymerase chain reaction (PCR) and expression by reverse transcriptase polymerase chain reaction (RT-PCR) showed 83.6% of *ica* operon, 11.5% of *bhp* gene, and 32.8% of *aap* gene for 61 *S. epidermidis* specimens. The *agrI* and *agrII* loci were detected in 77% and 19.7%, respectively. Oxacillin–resistance was verified by detection of *mecA* gene in 90.1%, and the minimal inhibitory concentration (MIC) values assessed by E-test have shown 83.6% resistance to oxacillin, 4.9% resistance to tigecycline, and intermediate resistance to quinupristin/dalfopristin in one specimen. Specimens were shown to be sensitive to linezolid and daptomycin, with high MIC50 and MIC90 values to vancomycin. Clonal profile determination by PFGE showed 11 clusters, and the ST2 type was determined to be the major cluster by MLST. The ability of *S. epidermidis* to produce biofilm has been shown, with predominant agrI locus, oxacillin–resistance, and highest prevalence of SCC*mec* type III. Some isolates showed resistance to newer antimicrobial agents, and molecular type determination revealed clones persisting for up to 17 years. The major one was the *S. epidermidis* ST2 invasive clone, pointing to the relevance of considering such organisms as important pathogens with potential ability to cause serious infection in inpatients, as well as taking into account the potential dissemination of such resistant pathogenic clones in hospital settings. The identification of *S. epidermidis* isolated from blood culture as a multi-resistant organism with the ability to form biofilm with the *agrI* locus was highly important for a better understanding of clones persisting in a university hospital for a 20–year period. An invasive *S. epidermidis* clone was characterized, which may be associated with serious clinical complications.

Keywords: biofilm; *mecA*; PFGE; MLST.

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