TITLE: IMPACT OF *STAPHYLOCOCCUS EPIDERMIDIS* SECRETED MOLECULES ON BIOFILM PRODUCTION OF *STAPHYLOCOCCUS* SPP. ISOLATED FROM ENDOCARDITIS.

AUTHORS: CAMPOS, J. C. M.[1]; GLATTHARDT, T.[1]; CHAMON, R. C.[1]; REVIELLO, J. S.[1]; ANTUNES, L.C.M.[2]; DOS SANTOS, K. R. N.[1]; FERREIRA, R. B. R.[1]

INSTITUTION: [1]INSTITUTO DE MICROBIOLOGIA PAULO DE GÓES, UNIVERSIDADE FEDERAL DO RIO DE JANEIRO (AV. CARLOS CHAGAS FILHO, 373, CCS, SALA I2-010, CEP 21941-902, RIO DE JANEIRO – RJ, BRAZIL). [2]CENTRO DE REFERÊNCIA PROF. HÉLIO FRAGA, FUNDAÇÃO OSWALDO CRUZ, RIO DE JANEIRO, BRASIL (ESTRADA DA CURICICA, 2000, CEP:22780-194, RIO DE JANEIRO – RJ, BRASIL).

ABSTRACT:

Several infections are caused by *Staphylococcus* spp., among them infective endocarditis (IE), which has a high mortality rate. Two factors associated with the pathogenesis of these bacteria are the high antimicrobial resistance and the ability to form biofilm, which also confers protection against antibiotics and the immune system. Therefore, there is a demand for new therapeutic options against these pathogens. *Staphylococcus* spp. are also found predominantly in the skin microbiota, and it was already reported that *S. epidermidis* can secrete compounds that inhibit colonization by pathogens. The aim of this study was to evaluate the impact of molecules secreted by *S. epidermidis* on growth and biofilm production of *Staphylococcus* spp. isolates from IE. The supernatant of commensal *S. epidermidis* was obtained, filtered and concentrated and its effect evaluated on growth and biofilm production of the clinical isolates of *Staphylococcus* spp. previously identified (8 *S. aureus*, 5 *S. epidermidis*, 4 *S. haemolyticus* and 4 *S. hominis*). Among the 21 isolates, 12 (57.1%) were biofilm-producers, including 7 *S. aureus*, 2 *S. epidermidis*, 2 *S. haemolyticus* and 1 *S. hominis*. A negative impact on that production was observed in 10 (83.3%) isolates when they were grown in the presence of the supernatant, without causing any effect on growth. Thus, among the biofilm-producers, 7 (100%) *S. aureus*, 1 (50%) *S. epidermidis*, 1 (50%) *S. haemolyticus* and 1 (110%) *S. hominis* exhibited less biofilm in the presence of commensal *S. epidermidis* secreted molecules. Biofilm composition was determined for these isolates and all presented a mainly protein-based biofilm. Typing of the *agr* operon, an important virulence regulator, revealed that most of these isolates were type I (37.5%) and type III (50%). We also investigated for the presence of genes related to biofilm production (*ica*, *sasG* and *aap*) by PCR. Seven (70%) isolates carried the *ica* gene, all *S. aureus* had the *sasG* gene, and the *S. epidermidis* was positive for the *aap* gene. The results indicate that some *Staphylococcus* spp. isolates from IE can produce biofilm at the conditions used and that *S. epidermidis* secreted molecules have activity against the biofilm produced, suggesting a promising therapeutic potential of this extract.

Keywords: *Staphylococcus* spp., biofilm, microbiota, infective endocarditis, secreted molecules.

Development Agency: FAPERJ, CAPES, CNPq.