Título: BIOFILM PRODUCTION BY *Staphylococcus epidermidis* ISOLATES FROM PATIENTS IN NEONATAL INTENSIVE CARE UNITS IN RIO DE JANEIRO

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Resumo:

Staphylococcus epidermidis virulence is mainly due to its ability to form biofilms, being involved in many cases of bloodstream infections (BSI). Biofilms are surface-attached layered bacterial cells embedded in a self-produced biofilm matrix, which can be formed by polysaccharide or proteins. The production of biofilm matrix is mediated by different genes and other factors which will determine its composition. This study aimed to characterize, phenotypically and genotypically, biofilms produced by 20 *S. epidermidis* isolates from bloodstream infections and nasal colonization from patients in neonatal intensive care units in Rio de Janeiro. The isolates were characterized for the presence of the biofilm related genes *icaADB*, *aap* and *embp* by PCR method. Biofilm was formed with or without NaCl 4% and then it was treated with $NaIO_4$ (40 mM) and proteinase K (100 µg/mL) to determine biofilm matrix composition. The sequence types (ST) were also determined using the MLST method. For 7 *ica*$^+$ isolates that produced moderate to strong biofilm the biofilm composition was polysaccharide, while other 4 isolates (1 *ica*$^-$ and 3 *ica*$^+$; 4 *aap*$^+$) that produced weak biofilm showed protein-based biofilm composition. Other 3 *ica*$^+$ isolates that produced weak biofilm showed polysaccharide-based biofilm after using NaCl 4% and 4 non-biofilm-producers (*ica*$^+$) started to produce moderate to strong polysaccharide-based biofilm with NaCl 4%. For other 2 isolates ica$^-$ that produced weak biofilm, no change in biofilm phenotype was found in NaCl 4% and the biofilm composition could not be determined. Despite the prevalence of polysaccharide biofilm production (70%) among the isolates there was no correlation between their clinical origin and biofilm composition. Between polysaccharide biofilm producers, 6 (43%) were included in ST2, 4 (28%) in ST35, 2 (14%) in ST577 (described in this work), 1 (7%) in ST20 and 1 (7%) in ST579 (described in this work). Among the protein-based biofilm producers, 2 (50%) were included in ST81 and this designation was related with this biofilm composition (p=0.005). Thus, we observed that *S. epidermidis* biofilms are predominantly polysaccharide-based regardless of the clinical origin and its production can be affected by an external factor like osmotic stress. Furthermore, biofilm composition may be related with isolates ancestry.

Palavras-chaves: *Staphylococcus epidermidis*, biofilm production, polysaccharide biofilm matrix.

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