Staphylococcus epidermidis is the predominant contaminant of platelet concentrates (PCs), a blood product used to treat patients with platelet deficiencies. This microorganism is able to form surface-attached aggregates (biofilms) in human skin" Taha et al (2018).

Abstract:

PURPOSE: Staphylococcus epidermidis is the predominant contaminant of platelet concentrates (PCs), a blood product used to treat patients with platelet deficiencies. This microorganism is able to form surface-attached aggregates (biofilms) in human skin. Herein, the abundance of S. epidermidis biofilm-producers in contaminated PCs compared to skin isolates was explored. Furthermore, the potential positive selection of S. epidermidis biofilm-producers during the blood donation process and PC manufacturing was investigated.

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METHODOLOGY: Twenty-four S. epidermidis isolates obtained from contaminated PCs and 48 S. epidermidis isolates obtained from the venipuncture area of human volunteers were compared for their ability to form biofilms in laboratory media and in PCs using a semi

quantitative crystal violet assay. Also, the presence of the biofilm-associated icaA and icaD genes was assessed by PCR-amplification.Results/Key findings.Biofilm production in laboratory media showed a higher number of S. epidermidis biofilm-producers in the skin-derived group (43.7%) compared to the PC-derived isolates (25%). However, all skin and PC isolates formed biofilms in PCs. The prevalence of ica-positive biofilm-producer isolates was similar in PC and skin isolates (16.6 and 18.8%, respectively). In contrast, the abundance of ica-negative biofilm-producers was lower in PC isolates compared to skin isolates (8.3 vs 25%, respectively).

CONCLUSION: Positive selection of S. epidermidis biofilm-producers during blood donation and PC manufacturing was not observed. Interestingly, ica-negative biofilm-producers seem to be negatively affected by skin disinfection, blood processing and PC storage. Furthermore, this study shows that S. epidermidis adopts a biofilm-forming phenotype in PCs regardless of its genetic background or origin.

Reference:

Taha, M., Kohnen, C., Mallya, S., Kou, Y., Zapata, A. and Ramirez-Arcos, S. (2018) Comparative characterisation of the biofilm-production abilities of Staphylococcus epidermidis isolated from human skin and platelet concentrates. Journal of Medical Microbiology. 67(2), p.190-197.

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