

Streptococcus mutans and Streptococcus sobrinus biofilm formation and metabolic activity on dental materials.

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Source

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Abstract

Abstract Objectives. To examine potential correlations between streptococcal biofilm formation and lactate production in streptococcal biofilms formed on the surface of dental materials with different surface characteristics. **Materials and methods.** Samples of a glass-ionomer cement (Ketac Molar) and a ceramic (Empress 2) were incubated with whole saliva and suspensions of *Streptococcus mutans* ATCC 25175 or *Streptococcus sobrinus* ATCC 33478 for initiating single-species biofilm formation for either 4 or 24 h. The relative amount of adherent, viable cells was determined using a Resazurin and a MTT assay. Metabolic activity was assessed by quantifying lactate production with a modification of the commercial Clinpro Cario L-Pop kit. **Results.** Both assays identified similar *S. sobrinus* biofilm formation on the two substrata; for *S. mutans*, the MTT test showed significantly fewer streptococci on the glass-ionomer cement than on the ceramic. Concerning metabolic activity, for *S. sobrinus*, significantly higher lactate production was observed for biofilms formed on the glass-ionomer cement in comparison to the ceramic, whereas similar values were identified for *S. mutans*. **Conclusions.** Within the limitations of the study, the results suggest that the pure amount of adherent streptococci does not a priori indicate the metabolic activity of the cariogenic bacteria organized in the respective biofilm. Thus, comparisons between the relative amount of adherent streptococci and their metabolic activity may allow for an improved understanding of the effect of dental material surfaces on the formation and metabolic activity of streptococcal biofilms.