Fatty acid effect on sucrose-induced enamel demineralization and cariogenicity of an experimental biofil-caries model

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Abstrak

Based on scarce evidence, fatty acids have been described as anticariogenic. The aim was to evaluate the effect of different types of fatty acids on enamel demin- eralization and on the cariogenic properties of Strepto- coccus mutans biofilms on a biofilm/caries model. Mature biofilms of S. mutans UA159 growing on bovine enamel slabs were exposed to 10 % sucrose for 5 min, 3 times per day followed by exposure to a panel of free fatty acids, including monounsaturated (oleic), polyunsaturated (lino- leic) and saturated (stearic) fatty acids, in concentrations of 0.1, 1 and 10 mM for five additional minutes. Enamel demineralization was determined before and after the experiments by microhardness. Slabs were retrieved to analyze biofilm biomass, viable bacterial counts and polysaccharide production. Biofilms exposed to sucrose, followed by oleic and linoleic acids, showed less demin- eralization than sucrose alone (p \ 0.05). Biomass, S. mutans colonies and insoluble extracellular polysaccharide production were reduced from the biofilms treated with oleic and linoleic fatty acids (p \ 0.05). No differences with the positive control were observed with the saturated stearic acid. Poly and monounsaturated fatty acids presented to S. mutans biofilms after a cariogenic challenge appear to reduce demineralization on enamel and to interfere with cariogenicity of S. mutans biofilms