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Root caries prevention via sodium fluoride, chlorhexidine and silver diamine fluoride in vitro

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Abstrak

ABSTRACT
Uncertainty exists as to how to best prevent root caries development. The aim of the present study was to compare sodium fluoride (NaF), chlorhexidine (CHX) and silver diamine fluoride (SDF) varnishes (V) and rinses (R) regarding their caries preventive effect in an artificial caries biofilm model. 140 bovine root dentin samples were cut, polished and embedded. Samples were allocated to seven treatment groups (n = 20/group): Four varnishes (applied once prior biofilm challenge): 38% SDF (SDFV), 35% CHX-varnish (CHXV), 22,600 ppm NaF-varnish (NaFV), placebo-varnish (PV); two rinses (applied once daily during biofilm challenge): 500 ppm NaF solution (NaFR), 0.1% CHX solution (CHXR); one untreated group. Caries was induced in a multi-station, continuous-culture Lactobacillus rhamnosus GG (LGG) biofilm model. Bacteria were inoculated 1 × daily, while 2% sucrose was supplied 8 ×/day followed by artificial saliva for 10 min. After 12 days, mineral loss (ΔZ) was measured in the effect area and adjacent to the varnished areas. Bacterial counts were assessed on de-Man-Rogosa-Sharpe agar. ΔZ was significantly lower in the NaFR group compared with all other groups. Varnishes did not significantly prevent mineral loss in adjacent areas. None of the agents had a significant antimicrobial effect on LGG. Regular fluoride rinses showed highest root caries-preventive effect.