

TITLE: NovaMin[®]+Fluoride Dentifrice Remineralizes Caries in Compromised Salivary Conditions In Vitro

AUTHORS: Anora K. Burwell

OBJECTIVE: To assess the potential of two fluoride dentifrices that contain different calcium phosphate sources to remineralize root caries in vitro under full and compromised salivary conditions.

METHODS: Bovine tooth roots were sectioned, epoxy-mounted, and progressively ground/polished to expose the dentin layer. Caries-like lesions were pre-formed by immersion for 72 hours in demineralization solution (pH=4.52, 37°C). Randomly-selected dentin samples were pulled after polishing (“sound”) and others were pulled after lesion formation (“lesion-only”).

The remaining samples were subjected to a 10-day remin/demin cycle that included twice-daily 30-minute soaks in demineralization solution (pH=4.52, 37°C) followed by two-minute dentifrice treatments (soak in 1:3 slurry with DI Water). Samples were soaked in either artificial saliva (AS, pH=7.00, 37°C) or compromised artificial saliva (CAS, pH=7.10, 37°C) between the twice-daily demineralization/treatment periods. CAS contained half the concentration of all organic and inorganic components compared to AS. Treatment groups were: A) Sound, B) Lesion-only, C) 5% NovaMin[®]+5000ppmF (ReNew[™]) in AS, D) 5% NovaMin[®]+5000ppmF (ReNew[™]) in CAS, E) Recaldent[™]+900ppmF (MI Paste Plus) in AS, and F) Recaldent[™]+900ppmF (MI Paste Plus) in CAS.

Surface microhardness (Knoop, HK) was measured on all samples using a load of 100 grams for 20 seconds.

RESULTS: Data were not normally-distributed and so were analyzed using non-parametric statistical methods (ANOVA on Ranks and Tukey). All HK data are presented as mean±S.E.M. with n=15. Results were: A) 49.49±1.52, B) 10.38±0.35, C) 34.02±1.54, D) 27.11±2.59, E) 10.31±0.41, and F) 9.98±0.30 with A>C=D>B=E=F (p<0.01).

Treatment with the NovaMin[®]+fluoride dentifrice resulted in significant hardening of lesions under full and compromised salivary conditions. In this model, however, the Recaldent[™]+fluoride dentifrice had no hardening effect on the lesions.

CONCLUSION: Preliminary data indicate that a NovaMin[®]+fluoride dentifrice has the potential to remineralize caries-like lesions on root tissue under both full and compromised salivary conditions. Results will need to be confirmed clinically.

Microhardness of Lesions under Different Salivary Conditions

