Evaluation of a Dentifrice Containing 8% Arginine, Calcium Carbonate, and Sodium Monofluorophosphate to Prevent Enamel Loss After Erosive Challenges Using an Intra-Oral Erosion Model

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Abstract

• **Objective:** The objective of this study was to assess the ability of a dentifrice containing 8% arginine and calcium carbonate (Pro-Argin™ Technology), and 1450 ppm fluoride as sodium monofluorophosphate (MFP) to prevent enamel loss from an erosive acid challenge in comparison to a silica-based dentifrice with 1450 ppm fluoride as MFP using an intra-oral erosion model.

• **Methods:** The intra-oral clinical study used a double blind, two-treatment, crossover design. A palatal retainer was used to expose the enamel specimens to the oral environment during the five-day treatment period. The retainer was designed to house three partially demineralized bovine enamel samples. The study population was composed of 24 adults, ages 18 to 70 years. The study consisted of two treatment periods, with a washout period lasting seven (± three) days preceding each treatment phase. A silica-based dentifrice without fluoride was used during the washout period. The Test Dentifrice used in this study contained 8% arginine and calcium carbonate (Pro-Argin Technology), and 1450 ppm fluoride as sodium monofluorophosphate (MFP). The Control Dentifrice was silica-based and contained 1450 ppm fluoride as MFP. The treatment period lasted five days, during which the panelists wore the retainer 24 hours a day (except during meals and the *ex vivo* acid challenges) and brushed with their assigned product while wearing the retainer. The panelists brushed once in the morning and once in the evening each day for one minute, followed by a one-minute swish with the slurry and a rinse with 15 ml of water. The panelists brushed only their teeth and not the specimens directly. There were four *ex vivo* challenges with 1% citric acid dispersed throughout the day: two in the morning, one in the afternoon, and one in the evening. Mineral loss was monitored by a quantitative light fluorescence (QLF) technique.

• **Results:** Twenty-three of 24 subjects successfully completed the study. The one subject who did not complete the study did so for reasons unrelated to the study or products used. The average percent mineral loss for the Test Dentifrice and Control Dentifrice was 9.74 ± 13.23 and 18.36 ± 14.14, respectively. The statistical analysis showed that the observed product differences were statistically significant (p < 0.001).

• **Conclusion:** The Test Dentifrice with 8% arginine, calcium carbonate, and 1450 ppm fluoride as MFP provided significantly better protection against erosive challenges in comparison to the Control Dentifrice with 1450 ppm fluoride as MFP.

*(J Clin Dent 2014;25(Spec Iss A):A7–13)*