A New Model for Demonstrating Enamel Protection Benefits Relative to Acid Challenge

B.R. Schemehorn, MS      G.D. Wood
Dental Product Testing
Noblesville, IN, USA
S.L. Eversole, AAS
Procter & Gamble Company
Mason, OH, USA
R.V. Faller, BS
Temple University Maurice H. Kornberg School of Dentistry
Philadelphia, PA, USA

Abstract

• **Objective:** To determine the applicability of a modified US FDA Caries Monograph test method for measuring the protective benefits of fluoride (F) against erosive, dietary acids.

• **Methods:** Acid-challenged teeth were treated in two studies with a dentifrice, rinsed, and then re-challenged in a series of tests using three dietary acids. Study 1 included dentifrices containing 1450 ppm F as sodium fluoride (NaF) + triclosan [A], 1450 ppm F (NaF) + potassium nitrate (KNO₃) [B], 1000 ppm F as sodium monofluorophosphate (SMFP) [C], and 0 ppm F (placebo) [D]. Study 2 included dentifrices containing 1450 ppm F (NaF) [A]; and 0 ppm F (placebo) [B]. Acids were analyzed for phosphate removed during tooth challenges, with post-treatment results compared to baseline. Results were averaged and reported as a % protection value for each product, with higher values indicating greater protection.

• **Results:** Study 1: % protection for A = 16.4; B = 13.0; C = 7.1; and D = –5.2. Study 2: A = 15.2; B = –10.5, with A = B > C > D: Study 1; and A > B: Study 2. In each study, p < 0.05, ANOVA.

• **Conclusions:** The model provides a viable tool for initially assessing the potential for fluoride-containing oral care products to protect teeth against erosive, dietary acids. This can then lead to further and more elaborate testing with reasonable expectations for outcomes.

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