Effect of Fluoride Gel and Varnish on Remineralization of Initial Caries Lesion of Enamel (In Vitro)

Tavassoli-Hojjati S[1], Haghgoo R[2], Sayahpour S[3], Shabani M[4]

[1]Assistant Professor, Pediatric Dentistry Dept, School of Dentistry, Islamic Azad University, Tehran Branch, Tehran, Iran.

[2]Professor, Pediatric dentistry Dept, Dental School, Shahed University of Medical Sciences, Tehran, Iran.

[3]Postgraduate Student, Pediatric Dentistry Dept, School of Dentistry, Islamic Azad University, Tehran Branch, Tehran, Iran.

[4]Dentist

Background and Aim: Although dental caries are very prevalent, there is little information on the remineralizing capability of highly concentrated fluoride products. The aim of this study was to evaluate the effect of 1.23% Acidulated Phosphate Fluoride (APF) gel and 5% NaF varnish on remineralization of artificial enamel caries in a PH-cycling model.

Materials and Methods: In this experimental in vitro study, artificial enamel caries lesion were produced in sixty premolar teeth. Depth of caries lesions were measured using polarized light microscopy (PLM). Then sections were assigned to four groups: 1.23% APF gel (Sultan), 1.23% APF gel (Kimia) and 5% NaF varnish (Durashield) and control. After samples preparation, dental sections were placed in a 21 days PH-cycling model (6 hours at PH=4.3 and 17 hours at PH=7). The longitudinal sections were evaluated by PLM for lesion depths. The amount and percentage of depth variation for each group were calculated and data were analyzed using one-way ANOVA and Tukey test.

Results: 1.23% APF gel (Sultan) group showed greatest amount of depth reduction with the average of 25.5%. The Case groups had significantly greater reduction in lesion depth as compared with control group ($P<0.05$). No significant differences were detected between the APF gel (Sultan), APF gel (Kimia) and NaF varnish groups ($P<0.8$).

Conclusion: APF gel and fluoride varnish efficacy in reducing enamel caries lesions of permanent teeth were similar in this laboratory study.

Keywords: Varnish, Acidulated phosphate fluoride, Remineralization, Demineralization, Polarized Light Microscopy.

* Corresponding Author Email: sayahpour.dds@gmail.com