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Evaluation of the Effect of S-PrG on Enamel Remineralization

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Objectives PRG Barrier Coat is based on the proprietary Giomer concept which incorporates the patented bioactive S-PRG (Surface Pre-Reacted Glass ionomer) filler technology.

Our objective is to investigate in vitro the effect of PRG Barrier Coat on remineralization of enamel subsurface lesions.

Methods The extracted molars were kept in a 0.1% thymol solution until the experimental procedure was initiated. 30 enamel samples which were assigned randomly to 3 groups (n=10) Group 1: 5% NaF varnish (Proshield varnish; President Dental; Germany) as a positive control, Group 2: Bioactive S-PRG (PRG Barrier Coat; Shofu Inc., Kyoto, Japan) and Group 3: Deionised Water as a negative control. The enamel samples were subjected to a pH cycling regimen for 8 days. Quantitative Light-induced Fluorescence (QLF) images were taken and analysed. Data analysis was carried out using one way ANOVA. In addition, images were analysed with Zeiss Cirrus HD SD-OCT 5000 OCT (Optical Coherence Tomography; Carl Zeiss Meditec, Dublin, CA, USA).

Results Both ΔF (percentage fluorescence loss) and ΔQ (ΔF times the area) values improved significantly after the treatment. In addition, the mean difference in ΔF of the control group was significantly lower than PRG Barrier Coat group ($p < 0.05$). Whereas the mean difference in ΔQ of PRG Barrier Coat group was not significantly when compared with F varnish groups ($p > 0.05$). Reflectivity from enamel that had increased with demineralization decreased with remineralization. OCT signal attenuation demonstrated a capability for monitoring changes of enamel lesions during remineralization.

Conclusions Both F varnish and PRG Barrier Coat showed a significant increase in efficacy for the remineralisation of human enamel subsurface lesions in the model used in this study.

Newer preventive agents such as PRG Barrier Coat are advocated as promoting remineralisation when used in addition to routine oral care. Additional investigation is needed to be further confirmed.