0973 Discolouration of glass-ionomer cements at different fluoride gel concentrations

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Objective: This study aimed to examine the threshold of fluoride concentration in staining glass-ionomer cement restorations (GIC).

Materials and Methods: Seventy extracted human permanent molars restored with GIC were treated with acidulated phosphate fluoride (APF) gel at predetermined concentrations ranging from 1ppm to 12300 ppm with standard procedures. For each tooth, a visual comparison to a shade guide was made 24 hours after the application for aesthetic changes to the GIC restoration. This cycle was carried out twice.

Results: Aesthetic changes presented as obvious loss in translucency and/or changes of shade to the surface of the GIC restoration. The average staining rates of GIC were 5.71% and 32.86% after the first application and the second application, respectively. After the second application, the staining rates were 100%, 90%, 20%, 10%, 10%, 0% and 0% at the fluoride concentration of 12500 ppm, 8000 ppm, 4000 ppm, 2000 ppm, 1000 ppm, 500 ppm, and 1 ppm, respectively. Staining rates increased with fluoride concentration on the second application (χ^2=38.314, df=1, p<0.001) but not the first (χ^2=2.352, df=1, p=0.125). The logistic regression method further suggested an increasing trend of staining rates upon fluoride concentration after the second application (p<0.001, OR=1.001, 95% CI=1.000, 1.001).

Conclusion: Staining of GIC as a result of topical APF application was associated with frequency and concentration of fluoride application. Further clinical trials are indicated.

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