

THE REMINERALIZATION EFFECT OF BIOACTIVE GLASS ON ENAMEL CARIES-LIKE LESIONS IN PRIMARY TEETH

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Abstract. Fluoride toothpastes can prevent caries but excessive of fluoride during early childhood can cause dental fluorosis. Newer products have been developed in an attempt to promote remineralization without causing fluorosis, such as bioactive glass. The aim of this study was to evaluate the remineralization effect of bioactive glass on enamel caries-like lesions compared with fluoride based products in primary teeth using micro-computed tomography to be an alternative remineralizing agent to avoid risk of fluorosis especially in young children. Fifty sound primary incisors were coated with nail varnish, leaving a 1x1 mm window and then immersed in a demineralizing solution for 96 hours to produce artificial enamel caries-like lesions. These teeth were then randomly divided into five groups of 10 teeth each group. Group A: control (artificial saliva), Group B: bioactive glass (NovaMin)(Dr.Collins Restore® toothpaste), Group C: 0.11% NaF (500 ppmF) (Colgate® Babies toothpaste), Group D: 0.22% NaF (1,000 ppmF) (Colgate® great regular toothpaste), and Group E: CPP-ACP (GC Tooth Mousse®). Each tooth was treated with its respective slurry twice daily for 2 minutes during the pH-cycling period. The pH-cycling method was carried out for 7 days. Each tooth was examined to determine mineral density using a micro-CT (Skyscan1173) three times: baseline, post-lesion formation, and post-treatment. The percent change in mineral density for each group and comparison among groups was conducted using the one-way ANOVA and LSD tests at a 95% level of confidence. Results showed all tested toothpaste dentifrices were effective for remineralization of caries-like lesions in primary teeth. Statistical analysis indicated that bioactive glass has no significant remineralization effect to 500 ppm F, and CPP-ACP but significantly less than 1,000 ppm F containing toothpaste. In conclusion, bioactive glass may be used in place of 500 ppm fluoride or CPP-ACP for remineralization of caries without the risk of fluorosis especially in young children,

Keywords: bioactive glass, micro-computed tomography, NovaMin, primary teeth, remineralization

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