Evaluation of The capacity of Fluoride Uptake by Enamel from Bio-active Restorative Materials in Primary Molars (In Vitro Study)

Sarah Ahmed Shawky 1* BDS, Amina M. Abd El Rahman 2 PhD, Sarah Ibrahim Mohamed Zeitoun 2 PhD

1. Department of Pediatric Dentistry and Dental Public Health, Faculty of Dentistry, Alexandria University, Egypt
2. Professor of Pediatric Dentistry, Pediatric Dentistry and Dental Public Health Department, Faculty of Dentistry, Alexandria University, Egypt

INTRODUCTION
Cention-N, TMR-Z Fill 10 universal, and Fuji II LC, are fluoride-containing bio-active restorative materials that can promote fluoride release and recharge capacity after treatment with topical fluoride.

METHODOLOGY
27 freshly extracted sound primary molars were collected, class V cavities were prepared. Teeth were randomly allocated into three groups: Group I: (n=9) restored with Cention N, Group II: (n=9) restored with TMR-Z Fill 10 universal, Group III (n=9) restored with Fuji II LC. Fluoride concentration in enamel (uptake) was evaluated for all teeth before, and 21 days after restoration using acid-etch enamel biopsy. The buccal surface of each tooth was subjected to an acid etch enamel biopsy using adhesive tape (Figure 1).

The fluoride concentration in the solutions containing the enamel biopsies was determined using the fluoride ion specific electrode in conjunction with a reference electrode. Comparison between groups was done using Kruskal Wallis test followed by Dunn’s post hoc test with Bonferroni adjustment. Wilcoxon Signed-rank was performed to assess differences in fluoride uptake at baseline and after 21 days within each group. Significance level was set at p value 0.05.

RESULTS AND DISCUSSION
By comparing the median fluoride ion concentration in the enamel within each group, it showed a statistically significant increase in fluoride concentration after restoration in the three groups (Table 1). After a 21-days interval, there was a statistically significant difference between the three groups in median fluoride uptake by enamel (P value=0.001*).

CONCLUSION
Enamel acquired significantly higher amount of fluoride (uptake) from Cention N compared to Fuji II LC, and TMR-Z Fill respectively after a 21-days interval. All the three materials could be considered suitable for class V restorations of primary teeth in high caries risk children.

REFERENCES