

ABSTRACT

The Effect of Chitosan Nanoparticles Addition into Glass Ionomer Cement Sealant to Fluoride Release and Fissure Adaptation

Background : Glass ionomer cement sealants adhere to occlusal fissures through high acid-base reactions and high fluoride release. The addition of nanoparticles with bioadhesive polymers into glass ionomer cement can increase the fluoride release and its concentration in the dental hard tissue. Chitosan is one of natural biocompatible polymers that can be used in dentistry. **Objective :** To prove the amount of fluoride release and fissure adaptation of glass ionomer sealant material by adding chitosan nanoparticles into the liquid. **Material and methods :** This experimental study used carious-free extracted third molars, divided into 2 groups. Group I: fissure sealant using glass ionomer cement (Fuji VII (GC, Japan) Group II: fissure sealant using glass ionomer cement modified with chitosan nanoparticles. Fluoride release measurements were carried out with a spectrophotometer on day 1, 7, 14, 21. Then, the fissure adaptation was observed by scanning electron microscope (SEM). **Results :** There was a significant difference in fluoride ions release ($p < 0.05$) between the two groups. The adaptation of sealant material in group II was better than group I, but no significant differences were found between the two groups. **Conclusion :** The addition of chitosan nanoparticles into GIC sealant increases its fluoride release. Fissure adaptation of chitosan nanoparticles modified GIC sealant is better than GIC sealant group although there were no significant differences between the two groups.

Keywords : glass ionomer cement sealant ,chitosan nanoparticles, fluoride release, fissure adaptation