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Efficacy of Nano-Hydroxyapatite on enamel surface of primary teeth following exposure to liquid medications in comparison with sodium fluoride (An in vitro study)

A Thesis

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Abstract

Background: Acid induced demineralization may be produced by the consumption of liquid medications routinely used to treat children. Therefore, different remineralizing agents has been used such as fluorides and hydroxyapatite nanoparticles; both of which have been added to oral care products to remineralize erosive lesions.

Aim of the study: To investigate the efficacy of Nano-Hydroxyapatite compared with sodium fluoride on enamel surface of primary teeth after exposure to pediatric liquid medications by analyzing changes in surface texture and weight.

Materials and Methods: Thirty extracted posterior primary teeth were selected to prepare the study samples, then they were assigned to three groups: A- Nano-Hydroxyapatite, B- sodium fluoride, and C- control. Groups A and B were exposed to Cephalexin and ParAzar liquid drugs. Afterwards, the samples were treated with 1% Nano-Hydroxyapatite suspension and 2% sodium fluoride solution. All the samples were examined for changes in surface roughness and waviness using Atomic Force Microscope, and weight changes using an electronic balance; at three periods: baseline, after 7 days of exposure to liquid medications, and after onetime exposure to treatment agents.

Results: Group A has showed a significant difference in surface roughness for Cephalexin and ParAzar subgroups; in a way that a significant increase in mean roughness values was noticed for Cephalexin subgroup between baseline and treatment periods; while there was a significant reduction between baseline and ParAzar exposure periods. Group B has showed a significant increase in mean average waviness values for Cephalexin subgroup; which was treated using sodium fluoride solution. Regarding weight, group A has showed a significant difference for Cephalexin and ParAzar subgroups; that were treated with Nano-Hydroxyapatite suspension.

Conclusion: 1% Nano-Hydroxyapatite suspension had the greatest remineralization efficacy on enamel surface of primary teeth when compared with 2% sodium fluoride solution; as expressed by surface texture and weight changes.