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Comparison of various concentrations of tricalcium phosphate nanoparticles on mechanical properties and remineralization of fissure sealants

Sara Rahimian Emam Shahed University of Medical Sciences, Iran

Objective: The aim of this study was to investigate the mechanical properties (flexural strength, micro-shear bond strength) and remineralizing potential of fissure sealants by adding various concentrations of β -tricalcium phosphate nanoparticles.

Materials & Methods: This *in-vitro* study consisted of five experimental groups containing prepared nano-fissure sealants (1-5 wt.% β -TCP nanoparticles) and two control groups containing a prepared and a commercial fissure sealant. Flexural/micro-shear bond strength values were measured using Zwick test machine. Cavities on sixty healthy premolar teeth were filled with the fissure sealants containing 0-5 wt.% of nano β -TCP. The samples were assessed for remineralization under scanning electron microscopy (SEM) and EDAX. Kolmogorov-Smirnov test, one-way ANOVA and Tukey's post hoc analysis/HSD were used to analyze the data.

Results: There was no significant difference between the flexural strengths/elastic modulus of the 0-5 wt.% nano β -TCP groups (p>0.05). The average flexural strength/elastic modulus of the prepared fissure sealant group (0%) was significantly higher than the commercial fissure sealant group (Clinpro) (p<0.05). There was no significant difference between micro-shear bond strengths of the experimental groups (1-5 wt. %), and between the commercial and the prepared (0%) fissure sealant groups (p>0.05). Examining the samples under SEM showed a significant increase in thickness of the intermediate layer with increasing concentrations of β -TCP nanoparticles (p<0.05).

Conclusion: Addition of 1-5 wt.% -TCP nanoparticles to the fissure sealants significantly increased the remineralization potential without affecting the mechanical properties.

so.kameli@yahoo.com

Investigation of the effect of low level laser therapy after micro surgery in mouth: A controlled clinical pilot study

Yuksel Kiran¹, Kamile erciyas² and Ayse Belgin Bal³ ¹Ishik University, Iraq ²Gaziantep University, Turkey ³Gazi University, Turkey

espite the use of lasers in dentistry from the 1980s until today, the use of low level laser therapy laser (laser bio-stimulation) is not very common in periodontology. The aim of this study is to evaluate the effect of low power 980 nm diode laser therapy after gingivectomy and in comparison to the non-surgical periodontal treatment on bone healing. Twenty systemically healthy patients with gingival hyperplasia due to chronic inflamation in the maxilla or mandibular anterior region at least in six teeth symmetrically were included. Bleeding on probing, gingival index, plaque index, clinical attachment level were recorded at the beginning and one month after treatment. The patients were underwent scaling and root planning treatment after one week of periodontal diagnosis. The curvicure of the ginigiva of patients were evaluated for the need of gingivectomy and gingivoplasty and were done for the patients that need this operation. The sides that applied laser therapy were determined by using coin toss and the other sides were protected from irradiation by putting at least 5 mm thickness of silicon made appliance. the laser of power 4 J/cm (980 nm) were applied at 0, 1, 3 and 7 days and the surgical area of all the patients at 0, 3, 7, and 15 days were painted with paint mira-2-tone and the taken photographes by the Image J programs were evaluated. Clinically, Kolmogorov-Smirnov test was used for checking the normal distribution of wound healing and VAS results. Willcoxan test and friedman test were used to compare the dependent two groups or multiple groups subsequently. The results showed that there were no significant differences between groups in SD, KAS, PI, GI, VAS and wound healing but there were a decreased in VAS values at 3 and 7 days. The area that applied DDL showed a decrease in pain. After this study, 980 nm low level therapy upon the clinical parameters could have a positive effects when applied after gingivectomy and gingivoplasty.