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Abstracts

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Comparative Evaluation of Remineralizing Efficacy of Biomimetic Self-Assembling Peptide on Artificially Induced Enamel Lesions

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The aim was to investigate the efficacy of biomimetic self-assembling peptide (P₁₁₋₄) on enamel remineralization compared to casein phosphopeptide amorphous calcium phosphate (CPP-ACPF) and fluoride based delivery systems. 40 enamel specimens were divided randomly into four groups (n = 10) according to the remineralizing agent; G1: artificial saliva (control), G2: fluoride varnish (Bifluorid 10, VOCO, Germany), G3: CPP-ACPF varnish (MI Varnish, GC Corporation, Japan), G4: self-assembling peptide agent (CURODONT Repair, Credentis, Switzerland). To induce artificial enamel lesions, the specimens were immersed in a demineralizing solution for 96 hours. All products were applied according to manufacturer's instructions and specimens were stored in a daily renewed artificial saliva. The surface microhardness was assessed at baseline, after demineralization, 1-week and 4-weeks remineralization. The mean surface microhardness recovery percentage (SMHR%) was calculated. Statistical analysis was performed with IBM®-SPSS® (IBM Corporation, USA) Statistics Version 20 and the significance level was set at $p \leq 0.05$. Two-way ANOVA analysis for the effect of different variables on mean SMHR%. One-way ANOVA followed by Tukey's post-hoc test to compare between more than two groups. Student's t-test to compare between two groups. The highest SMHR% was found in self-assembling peptide (81.12 ± 9.22) followed by fluoride (47.72 ± 8.85) and CPP-ACPF (47.41 ± 14.15) with the lowest SMHR% in artificial saliva (7.53 ± 4.50) at $p < 0.001$. No statistically significant difference was found between fluoride and CPP-ACPF at $p = 0.99$. There was a statistically significant difference in SMHR% between 1-week (39.71 ± 25.95) and 4-weeks (52.18 ± 28.76) at $p < 0.001$. In conclusion, self-assembling peptide confers the highest remineralizing efficacy compared to fluoride and CPP-ACPF; showing a promising, non-invasive regeneration potential. Also, extended period of time helped to attain more benefits from the remineralizing regimens applied.

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Remineralization Potential of Galla Chinensis, and Grape Seeds Extracts

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This study was carried out to evaluate remineralization potential of both Grape seeds extracts (GSE) and Galla Chinensis extracts (GCE). Furthermore evaluate if the addition of fluoride had a synergistic effect with (GSE) and (GCE). Artificial carious lesions were created on 60 sound human molars. The specimens were divided into six groups according to remineralizing agents used. G1, the specimens were immersed in artificial saliva (control), in G2 sodium fluoride 0.24% NaF. G3, 0.4% GCE. G4, 6.5% GSE. While in G5, 6 NaF+GCE and NaF+GSE respectively. The surface microhardness (SMH) and Environmental Scanning Microscope (ESEM) in each group was assessed prior to creation of artificial carious lesion, after creation of artificial carious lesion, after remineralization with 2, 4 weeks and after exposure to acidic challenge. Data was analyzed using ANOVA and Tukey test.

Demineralized enamel showed the lowest (SMH). After 2 weeks remineralization SMH were ranked as follows, NaF, GCE, GCE+NaF and GSE+NaF (238.88 ± 14.32 , 244.77 ± 9.36 , 246.72 ± 11.29 , 237.93 ± 10.79 HV) > GSE and control groups (220.81 ± 13.55 , 212.58 ± 16.78 HV). However after 4 weeks remineralization showed the following, NaF, GCE and GCE+NaF groups (261.44 ± 15.90 , 268.02 ± 15.82 and 269.28 ± 13.94 HV) > GSE+NaF (249.74 ± 10.36 HV) > GSE = control group (230.54 ± 13.54 HV). After exposure to acidic challenge, SMH NaF, GCE, GCE+NaF groups were (244.01 ± 17.49 , 247.90 ± 17.62 , 255.37 ± 14.19 HV) > GSE+NaF group (220 ± 10.92 HV) > control and GSE group (168 ± 14.19 , 192.65 ± 11.48 HV). (ESEM) showed mineralized coating at variable degree according to remineralizing agents used. In conclusion, GCE has equal remineralization potential to fluoride based remineralizing agent. Addition of fluoride enhance the remineralization potential of GSE, meanwhile it did not affect the remineralization potential of GCE.