activity inhibited with 0.05% METMAC, MAPTAC, DDAC and MCMS, 0.1% ATA.

Conclusion: The inhibitory activity of QAMs on cysteine cathepsins was well-demonstrated with different specificity rates. Although both enzymes were inhibited by all tested QAMs, higher concentrations were necessary to promote CP-8 inhibition than CP-K.

Keywords: Cysteine cathepsins; Quaternary ammonium methacrylates; inhibition

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Anti erosive potential of bioactive glasses on enamel

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Purpose: The aim of this study was to determine the potential of two commercial bioactive glasses as secondary preventives against enamel erosion.

Methods and materials: The two bioactive glass evaluated in this in-vitro study were NUPRO260 Seinosylanse (Sylic) Proprietary paste (Dentsply) (Nupro) and Sylic Proprietary Pore Forming Powder (Novamin®) (Sylic). Thirty enamel samples measuring 5 mm x 5 mm were prepared from the middle third of sound human premolar and molar teeth. The samples were flattened and polished and randomly divided into three groups (n = 10): Group (N): Nupro and S (Sylic). All samples were subjected to 10 min of demineralisation in 0.3% citric acid at a pH of 3.2 ± 0.1. Baseline surface microhardness measurements were made using a Knoop Indenter (MMV-2 Shimadzu Corporation, Japan). Subsequently, Nupro was applied on the enamel samples using a rotating rubber cup attached to a slow speed contra angled handpiece for 30 s. For the second test group, Sylic was air blasted with the Sylic Smart Tip onto the surface of the enamel samples for 15 s at a constant distance of 5 mm. Samples were stored in remineralisation solution at 37°C and submersion in the remineralisation solution was made again at the second day. Subsequently, samples in all 3 groups were subjected to daily cycles of acid challenge for 10 min and storage in remineralisation solution at 37°C for six days. Surface microhardness measurements were made every day after the acid challenge. Additional samples were prepared for SEM-EDX analysis at Baseline, Intervention and Day 6 of demineralisation. The difference in surface microhardness of the various point samples from Baseline, SMH, was the outcome measure used. The data were analysed with SPSS v22.

Results: All three groups showed a general trend of decrease in surface microhardness over time. Multivariate test for repeated measures showed significant differences in SMH over time for all three groups. Post-hoc analysis using Dunnnett's test showed that there were significant difference between both Nupro and Sylic with the control group (p < 0.05). However, pairwise comparison for the Nupro group showed that significant differences in SMH were found only between Baseline and Intervention. No significant differences were observed between the other measurement points with Baseline. As for the Sylic group, pairwise comparison showed significant differences between Baseline and Intervention and up to Day 3 of demineralisation.

Conclusion: Nupro and Sylic were able to reduce the rate of enamel erosion. Sylic showed better reduction than Nupro.

Keywords: Bioactive glasses; Enamel; erosion

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Development of experimental endodontic sealers based on MTA and salicylate

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Purpose: Mineral trioxide aggregate (MTA) cements have a wide range of applications as root-end filling materials, pulp capping and root canal sealers. The objective of this study was to develop and evaluate physico-mechanical properties of three experimental root canal sealers based on MTA and resin salicylate.

Methods and materials: The materials were composed by one base paste and three different catalyst pastes. The base paste was prepared with bismuth oxide and 1.3-butyleneglycol dicarboxylate. Three different catalyst pastes were formulated: (G1) Resimpol 8 (RP8) + titanium dioxide (TiO2) + MTA, (G2) RP8 + TiO2 + MTA + hydroxyapatite and (G3) RP8 + TiO2 + MTA + dibasic calcium phosphate dehydrate. MTA Fillapex (Angelus) was used as control. Some physico-mechanical properties were analyzed such as: flow and working time (ISO 6862:2001), viscosity and setting time (Brookfield viscometer spindle, SCV-18 model) and diametral tensile strength (Instron 1144), in accordance with the specifications. Data were submitted to one-way ANOVA and means compared by Tukey test (5%).

Results: MTA Fillapex showed the highest values for all properties. Regarding the experimental materials, G2 and G3 showed the highest values of working and setting times. Higher flow value was found to G3. For viscosity and diametral tensile strength all experimental sealers were statistically similar.

Conclusion: It could be concluded that all experimental materials tested presented good physical-chemical properties. These properties analyzed showed values close to those recommended by the specifications in order to sealers be used clinically.