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Presentation Type: Poster Session

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Objective: To test the tubules occlusion of an arginine-based professional treatment for hypersensitive dentin.

Method: Dentin segments/discs were prepared from erupted sound molars. Elmex sensitive professional desensitizing paste (GABA Int. by Colgate Oral Pharmaceuticals, Dallas, USA) containing arginine 8% and calcium carbonate was applied on EDTA-treated dentin for 20s at 1000rpm using a prophyl cup, following the manufacturer directions. The excess was removed using a microbrush then the dentin disc was gently rinsed and immersed in 20mL of simulated body fluid (Hank's Balanced Salt Solution, HBSS) at 37°C. After 24h, 7 and 28d the dentin surface was analyzed by ESEM-EDX to evaluate the tubules occlusion and the mineral content. Elmex paste mixed with calcein solution 1% was used to evaluate its penetration depth into the tubules by confocal microscopy.

Result: After 24h in HBSS, ESEM-EDX analyses on Elmex-treated dentin showed the presence of precipitates on dentin surface and in the dentinal tubules, relevant amount of N(16-19 wt%, demonstrating the presence of arginine and Ca/P molar ratio ≥ 3.0 . Confocal microscopy showed a penetration of the paste into the dentinal tubules to a mean depth of approx 50 microns (maximum depth penetration 100 microns).

ESEM showed the presence of many tubules still obturated by material after 7d in HBSS; EDX found N (approx 19 wt%) and Ca/P molar ratio was 2.43.

After 28d in HBSS a coating of calcium phosphate deposits covered the dentin surface so tubules were not visible; EDX detected N (6-7 wt%) and showed a Ca/P molar ratio of 2.14.

Conclusion: Elmex sensitive professional paste can obturate the dentinal tubules and adhere to the dentin surface. Evidences of mineralizing properties have been found by the deposition of calcium and phosphate-containing minerals within the dentinal tubules and the formation of a calcium phosphate protective layer on the dentin surface.

Student Presenter

Keywords: Dentin, Dentin fluid, Minerals, Occlusion and dentin hypersensitivity

Presenting author's disclosure statement: ** MISSING DISCLOSURE **

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