

*Saturday, September 7, 2013: 11:30 a.m. - 12:30 p.m.*

*Location: Limonaia*

*Presentation Type: Poster Session*

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**Objective:** To test the ability of a calcium carbonate-containing toothpaste for dentinal hypersensitivity to occlude the exposed open tubules of dentin surface.

**Method:** Dentine slices (0.9±0.1 thick) and crown segments (1.5±0.3 cm thick) from human third molars were used.

Elmex Sensitive Professional toothpaste (GABA Int AG, Therwill, Switzerland) containing as main active ingredients arginine (8%), sodium monofluorophosphate (1450 ppm F<sup>-</sup>) and calcium carbonate, was applied (3 min) on coronal dentin surface.

Fluid flow/permeation through the dentin thickness (i.e. permeability or hydraulic conductance, Lp in microliters/min) was evaluated using a digital fluid flow-meter after smear layer formation, after EDTA treatment, after Elmex toothpaste treatment (t=0) and after soaking for 1, 7, 28 days in simulated body fluid (HBSS). Tubules occlusion, elemental analysis and mineral content were studied by ESEM-EDX.

Toothpaste penetration inside dentinal tubules was analyzed by laser confocal microscopy using calcein as tracer.

**Result:** Lp of EDTA-treated dentin significantly decreased after treatment with Elmex toothpaste (-73,32% at t=0) and after soaking in HBSS the Lp values further decreased (-77,69% at 24h, -78,18% at 7d, -83,01% at 28d).

After 24h and 7d in HBSS, ESEM on Elmex-treated dentin showed the presence of precipitates on dentin surface and in the dentinal tubules; EDX revealed N (from arginine) and F (from monofluorophosphate) of the toothpaste. Lp remained significantly lower (-78,18%) than EDTA-treated control dentin.

After 28d in HBSS, a calcium phosphate layer was detected on dentin surface so tubules were not visible. EDX detected F and no N. No CaP deposits were found on EDTA-treated dentin soaked in HBSS.

Confocal microscopy showed an average penetration depth of the toothpaste into the dentinal tubules of ~85 microns.

**Conclusion:** Elmex sensitive toothpaste can reduce the fluid movement into the exposed dentinal tubules and favour the formation of calcium phosphate minerals.

#### **Student Presenter**

**Keywords:** Demineralization/Remineralization , Dentifrices, Dentin, Home care and Preventive dentistry

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

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