Oral Presentations - Research Supported by P&G

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RCT Evaluating Safety and Efficacy of Whitening Products in Xerostomies
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Objectives: The primary objective was to evaluate the safety and efficacy of an experimental tooth-whitening strip under the conditions of medication induced hypoausalivation. Methods: The study population was currently taking xerogenic medication which resulted in unstimulated salivary flow of < 0.2 ml/min. Forty-six subjects (ages 22-79, 62% female, 79% Caucasian), without tooth sensitivity or vital bleaching history were screened and 42 subjects entered into a single center, randomized, double blind placebo controlled study (Placebo n=14, Experimental - 10% H2O2 n= 28) The major causes of staining were coffee, tea, and dark cola (83%) -median of 2 drinks /day and tobacco use (10%). Subjects were instructed to apply a strip to maxillary arch, 30 minutes twice a day for 14 days. One subject withdrew due to an unrelated illness at Day 8. Digital Imaging analysis was used to compare the two treatments at Day 8. Oral irritation and tooth sensitivity were captured as Adverse Events (AEs) for both groups. Analysis of covariance (ANCOVA) was used for maxillary color change from baseline (2-sided tests).

Results: At Day 8 a significant improvement was seen in the experimental group vs. placebo in Δb* reduction in yellow -1.65± 0.115 (mean ± SE) and -0.32± 0.170 respectively, ΔL* lightness 1.53 ± 0.130 and 0.37 ± 0.191 respectively, and ΔW* composite color -2.24 ± 0.154 and -0.47 ± 0.226 respectively; all at p<0.0001. With continued use to Day 15, an incremental color improvement occurred. Overall there were 21 adverse events with 17 possibly or probably related. All events were mild and mainly for gingival irritation or tooth sensitivity. No subjects discontinued treatment for a treatment related AE. Conclusion: In medication- induced hypoalusalivation subjects, twice daily topical application of 10 % hydrogen peroxide whitening strips was well tolerated and resulted in a significant improvement in tooth color (Study funded by Procter & Gamble)

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Stannous Fluoride Oxidation State and Specifications by ESCA Analysis
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Stannous fluoride provides clinical benefits for both caries and gingivitis. The use of stannous fluoride is affected by bioavailability and side effects such as tooth stain. Stannous is quite difficult to chemically analyze particularly at surfaces. Objectives: We examined the suitability of Electron Spectroscopy for Chemical Analyses (ESCA) techniques to enumerate stannous speciation and oxidation as a first step toward assessing applications to stannous deposited on apatite and enamel surfaces. Methods: Tin standards were analyzed by ESCA using a PHI S600ci X-Ray Spectrometer (XPS) from Physical Electronics, Eden Prairie, Minnesota, USA; standards included: Sn metal, SnO, SnO2, SnF2, SnS, SnSO4, Sn2OPO4, Sn2O(OH)PO4, SnF2PO4 and mixtures with HAP (SnO+HAP, SnO2+HAP, SnF+HAP, SnS+HAP, SnSO4+HAP, Sn2(OH)PO4+HAP, Sn2F3PO4+HAP, Sn2FPO4+HAP). For each sample from these two groups survey and multiplex spectra with Mg and Al X-ray anode where collected. The Auger parameter was determined for each compound adding binding energy of the photoelectron from 3d5/2 orbital of Sn to kinetic energy of the Auger line M4N45N45. In this way the Auger parameter provided a fingerprint of chemical environment and oxidation state of Sn. Results: The values of the Sn3d5/2 peak shift are between 0,1 eV and 3,2 eV. The calculated Auger parameters for (II) oxidation state are higher 919,2-920,5 eV than the values found out for the compounds with predominant (IV) oxidation state 917,5 – 919 eV. Through background subtraction based on modified Shirley method (Proctor, A.; Sherwood, E. P. Anal. Chem. 1989, 54, 13) and curve fitting the proportional percentage concentration of the two oxidation states coexisting in the complex Sn-compounds could be quantitatively determined.

Conclusion: ESCA techniques can be used to assess changes on surface properties of enamel and dentin treated with stannous fluoride formulations in vitro or ex vivo with proven sensitivity to enumerate stannous speciation and oxidation.