P&G Oral Presentations

Thursday, March 11

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Comparative Peroxide Degradation with Brush-Applied Whitening Systems

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Objective: This research compared the peroxide degradation profile of two brush-applied hydrogen peroxide whitening products. **Methods**: 17 adults were enrolled in the cross-over study comparing Crest® Night Effects™ (a sodium percarbonate bleaching film) and Colgate® Simply White™ Night, (a hydrogen peroxide paint-on gel). Application was supervised. Peroxide degradation kinetics was measured on the teeth and in saliva over a 4-hour period using an automated titration system. Treatments were compared at individual time points over 30 minutes, and overall using the area-under-the-curve calculation of total peroxide exposure (concentration over time). **Results**: For the percarbonate film, median peroxide concentrations in the teeth samples were 5.2%, 4.5%, 4.1%, and 2.8% at the 0.5, 5, 10 and 30 minute time points, respectively. All film samples had measurable peroxide 4 hours after application, with median peroxide concentrations on teeth of 1.0% and 0.2% after 2 and 4 hours, respectively. For the hydrogen peroxide paint-on gel, median peroxide concentrations in the teeth samples were 4.6%, 0.2%, 0.0%, and 0.0% at the 0.5, 5, 10 and 30 minute time points. At 30-minutes, only 1 of the paint-on samples exhibited any measurable peroxide. Salivary samples for both systems never exceeded 0.04% at any time point. Except for the 30-second time point, treatments differed significantly ($p < 0.05$) with respect to peroxide concentrations on teeth. AUC calculations of peroxide concentration over time showed significantly ($p < 0.05$) greater peroxide residency for the film compared to the gel. **Conclusion**: **For the two overnight brush-applied whitening systems, the sodium percarbonate film exhibited peroxide residency on teeth over several hours compared to a hydrogen peroxide paint-on gel which had little remaining peroxide after 5 minutes.**

Friday, March 12

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Bleach Uptake into Pulp and Models for Hypersensitivity Effects (Poster Discussion)

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Transient tooth sensitivity is the most common side effect of vital tooth bleaching. Sensitivity is likely affected by reactivity of pulp to bleaching regimens. **Objectives**: This study examined the uptake of hydrogen peroxide into pulp chambers of teeth *in vitro* from applications of Crest® Whitestrips® Supreme (CWSS) bleaching strips containing 14 % hydrogen peroxide in a fixed low unit dose strip application system. **Methods:** The approach to testing was based on the published methodology of Bowles (J Endodont 13, 1987). Human canine roots were sectioned 2 mm above the DEJ and pulps were cored under water cooling. Pulp volumes were measured and teeth were prepared for mounting on Eppendorfä vials. Enamel surfaces were pre-equilibrated with saliva for 24 hours and pulps were washed with water and imbibed with 0.1 M acetic acid/acetate buffer pH = 4.5 pre-saturated with HAP mineral. CWWS strips were placed on facial surfaces of canines simulating coverage in clinical settings and the strips + teeth were immersed in saliva (0.5 ml) for 30 minutes – the recommended CWWS treatment time. Control teeth were treated in saliva only. At 30 minutes pulp buffer was pipetted and the chamber was quickly washed. Pulp fluid was analyzed for H_2O_2 per Bowles. Pulp uptake values were compared with peroxide values previously reported to affect pulp enzymes under *ex vivo* conditions. **Results**: Peroxide uptake in dental pulp measured 15.95 ± 12.38 ppm (in fluid) from strip applications (sig. vs. control $p< 0.05$). **Conclusions: Bowles method was successfully modified to measure peroxide uptake from Whitestrips. Significant peroxide diffuses into pulp cavities with CWWS exposures, though comparison to literature studies suggests that peroxide uptake from CWSS was 100 fold below levels required to induce 10 % inhibitory effects on pulpal enzymes *in vitro.***

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