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Ex-Vivo Glycolysis Response to Antimicrobial Mouthrinse in an Orthodontic Population

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Broad spectrum antimicrobials may prove advantageous for plaque, gingivitis and caries control in orthodontic populations. Plaque Glycolysis and Regrowth Method (PGRM) is an *ex vivo* assay for plaque acidogenic virulence and also the bioavailability, retention and proportional efficacy of antimicrobial (J Clin Dent 6: 59, 1995; Food and Drug Administration 21 CFR Part 356 Vol 68: 103, May 30 2003). PGRM applications may prove particularly valuable to developing effective chemotherapeutic aids to orthodontic populations where hygiene management is difficult. **Objective:** This study examined the effectiveness of antimicrobial mouthrinse containing stannous fluoride on plaque acidogenic virulence in an orthodontic population *ex vivo*. **Methods:** Four children undergoing fixed orthodontic therapy had plaque collected from a maxillary control quadrant with a foam swab. Subjects rinsed with commercial stannous fluoride mouthrinse for 30 seconds (10 ml) and expectorated. Subjects had a second plaque sample taken from a mandibular quadrant 15 minutes post rinsing. 45 minutes post rinsing, maxillary and mandibular plaque samplings were taken from non-sampled quadrants. Swabs were immediately vortexed in 0.03 % trypticase soy broth and chilled until analysis. Plaque dispersions were normalized to an OD of 0.10 (spectrometer at 600nm) and sucrose was added to initiate glycolysis which took place in 2 ml Eppendorf tubes at 37°C for 2.5 hours. pH response of the incubation buffers was compared to starting pH's. Averages of pH response were compared across quadrants and across subjects. **Results:** Plaque pH (±SD) by sampled quadrants initial, 15-min, 45-minA, 45-minB (initial pH=7.27): 5.39(0.15)a:6.95(0.14)b: 6.18(0.66)c: 6.28(0.39)c (letters denote statistical groupings Students t p <0.05). **Conclusion: Antibacterial mouthrinse produced significant glycolysis inhibition for 45 minutes post use, with inhibitory effects diminishing from 15 – 45 minutes post use. Repeated measures sampling (45 min) revealed equivalent glycolysis response. An acute PGRM glycolysis response to antimicrobials is validated in orthodontic populations.**

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Cetylpyridinium Chloride Rinse Bioavailability Assessed by Plaque Vitality Kinetics

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The biofilm mode of growth in the oral cavity offers protection against chemical plaque control. The degree of protection offered by topical antimicrobials can be assessed by Confocal Scanning Laser Microscopy (CSLM) with specialized dyes to assess vitality of treated biofilms. **Objectives**: The aim of this study was to assess effects of three cetylpyridinium chloride (CPC) containing mouthrinses for biofilm kill and retained antimicrobial actions *in vivo.* **Methods**: 5 subjects carried out standard oral hygiene with Crest Regular dentifrice with the additional single use 30 s 15 ml applications of the following CPC formulations: Scope (SM), Viadent(VM) and Crest Pro-Health (CPH) mouthrinse respectively. For treatments a plaque sample was collected as a control quadrant, rinsing took place and then additional plaque quadrants were sampled immediately post use, 1 h and 6 h post use. Plaque was dispersed by sonication and immediately analyzed after Baclight® fluorescent staining with CSLM analysis (Busscher et al., Journal of Dental Research, 2003 Abstract 158). **Results**: Viability of control plaques averaged 40-60%. % bacteria killed with treatments measured: ImmediateSM=22(%killed)a;VM=22a; CPH=56b, 1 h post use-SM=23a;VM=16a;CPH=34b, 6 hours post use - SM=-11a; VM=00ab; CPH=12b (a≠b $p < 0.05$ Students t). **Conclusions: CPH rinse clearly showed the greatest formulation bioavailability with respect to bacterial cidal activity and retained antibacterial effects. Although expected in comparison to cosmetic breath rinse (SM) these results were surprising for therapeutic marketed VM. These results show wide variability in formulation bioavailability for commercial CPC rinses, with CPH providing high bioavailability.**