P&G Oral Presentations

Thursday, March 10

0346

Effects of Peroxide Bleaching on Human Enamel Wear Susceptibility

S. ST. JOHN, D.J. WHITE, and J. ZOLADZ
P&G, Mason, OH, USA

Vital tooth bleaching continues to gain popularity with hygiene conscious consumers. Importantly, peroxide based tooth whiteners should provide cosmetic benefits without harming dental tissues or changing their resistance to environmental stimuli. **Objectives:** Characterize the response of enamel to abrasive wear following a period of exaggerated laboratory bleaching treatments using Crest® Whitestrips® Supreme tooth whitener. **Methods:** Human enamel blocks were mounted in methacrylate and cycled through a 21-day regimen: 1) morning and afternoon fluoridated dentifrice supernatant treatments; 2) four-times-daily, thirty-minute bleaching exposures with 14% H_2O_2 Crest® Whitestrips® Supreme incubated at 37°C. Samples soaked overnight and between treatments in human saliva. After cycling, stratified specimens either immediately underwent controlled abrasive challenges or equilibrated an additional two weeks with *bid* dentifrice treatments before assessment of wear resistance. To measure wear, samples had a pre-brush Vickers indent series made on them. Following initial measurements, specimens were stratified to abrasive (bleached and non bleached) and were brushed for a series of 500-1000-2500-4000 strokes using Oral-B® Indicator® 40 soft brushes in a V-8 cross brushing machine with a 150g load. Specimens were brushed with one of three abrasive systems: Ultrabrite® (mid-high REA – alumina/silica blend), Crest® Cavity Protection (mid-low REA – silica), and Colgate® Cavity Protection (low REA – dicalcium phosphate dihydrate). At each time point wear was assessed by examining brushed indents and new indents were impressed to measure wear at the next time point. **Results:** Digital imaging color assessments supported bleach efficacy during the study. Enamel wear followed known REA assessments. Importantly, peroxide bleaching had no effect on susceptibility of enamel to abrasive wear. Enamel lost, mm bleach/no bleach = alumina/silica blend, 13.2/14.0 > silica 6.85/6.88, > DCPC, 2.60/2.89. Abrasive differences were significant ($p < 0.05$) while bleach effects were not. **Conclusion: Enamel wear susceptibility to toothpaste abrasives is not changed by tooth bleaching with Crest® Whitestrips®.**

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0347

Effects of Peroxide Bleaching on Human Root Dentin Wear Susceptibility

J. ZOLADZ, S. ST. JOHN, and D.J. WHITE
P&G, Mason, OH, USA

Although crown enamel is the targeted substrate for tooth whitening, dentin may be exposed to bleaching conditions. Because of its increased solubility, dentin may be at more risk to potentially damaging effects from dietary materials or topical agents, including bleaches. **Objectives:** Characterize the response of dentin to abrasive wear following a period of exaggerated laboratory bleaching treatments using Crest® Whitestrips® Supreme tooth whitening bleach. **Methods:** Human root dentin blocks were mounted in methacrylate and cycled through a 21-day regimen: 1) morning and afternoon fluoridated dentifrice supernatant treatments; 2) four-times-daily, thirty-minute bleaching exposures with 14% H_2O_2 Crest® Whitestrips® Supreme incubated at 37°C. Samples soaked overnight and between treatments in human saliva. After cycling, stratified specimens either immediately underwent controlled abrasive challenges or equilibrated an additional two weeks with *b.i.d.* dentifrice treatments before assessment of wear resistance. For wear, samples had half of the surface covered with a protective tape. Specimens were stratified to abrasive (bleached and non bleached) and were brushed using Oral-B® Indicator® 40 soft brushes in a V-8 cross brushing machine with a 150g applied load at the brushing surface with profilometric wear assessment at 2000 and 10000 strokes using one of three abrasive systems: Ultrabrite® (mid-high REA – alumina/silica blend), Crest® Cavity Protection (mid-low REA – silica), and Colgate® Cavity Protection (low REA – dicalcium phosphate dihydrate). **Results:** Digital imaging color assessments supported bleach efficacy during the study. Dentin wear followed known RDA assessments. Importantly, peroxide bleaching had no effect on susceptibility of dentin to abrasive wear. Dentin lost, mm bleach/no bleach = alumina/silica, 47.2/48.9 > silica, 40.4/42.0 > DCPC, 11.8/14.1. Abrasive differences were significant ($p < 0.05$) while bleach effects were not.

Conclusion: Dentin wear susceptibility to toothpaste abrasives is not changed by tooth bleaching. Incidental exposure of root specimens to Crest® Whitestrips® does not increase susceptibility to abrasive wear.