Tooth Surface Enhancement by a 16% Carbamide Peroxide Take-Home Bleaching Gel Containing ACP

in vivo study


Objective:
To evaluate the effectiveness of a dual-barrel, 16% carbamide peroxide equivalent, take-home bleaching gel containing amorphous calcium phosphate (ACP) in enhancing tooth surface smoothness and gloss.

Materials:
• 16% carbamide peroxide equivalent gel containing ACP (NiteWhite Excel 3 ZCP, Discus Dental)

Methodology:
Ten healthy adults wore a custom tray containing the test ACP gel for a minimum of four hours daily (or overnight) for two weeks. Evaluations of tooth color, surface roughness and gloss were made at baseline, one week, two weeks and +five days post treatment. The surface gloss index (SGI) and surface roughness index (SRI) measurements were performed by a single experienced examiner who evaluated the anterior teeth. The SGI utilizes a six-point subjective scale, and the SRI uses a four-point scale. For the tooth color evaluation a 16-point Vita Shade Guide score index was used. Mean “before” and “after” tooth color scores, SGI scores and SRI scores were calculated. Mean differences between baseline values and after-treatment values were also reported. A t-test was used to determine significant differences with alpha set at 0.05.

Results:
Compared to the baseline control values, the ACP gel showed a significant (p < 0.01) longitudinal percent improvement in tooth surface gloss and roughness at one week (SGI = 10.1%; SRI = 6.15%) and two weeks (SGI = 22.4%; SRI = 15.4%). Tooth color was also improved significantly compared to baseline, reaching a maximum shade change of 8.13 (± 1.02) units at day 14 (t-test, p < 0.0001). At the +five days post-treatment evaluation, no significant changes in tooth color, SGI or SRI were found compared to day 14 results (p < 0.0001).
Conclusion:
The dual-chambered, 16% carbamide peroxide equivalent, ACP-containing bleaching gel has superior tooth whitening and surface properties that include excellent tooth-whitening ability (8+ Vita Shade Guide improvements from baseline) and improving teeth luster (significantly increased enamel gloss and decreased enamel roughness compared to baseline).