

Benefits of ACP

in vitro study

Influence of Five Home Whitening Gels and a Remineralizing Gel on the Enamel and Dentin Ultrastructure and Hardness

Pineiro HB, Cardoso PEC. Influence of Five Home Whitening Gels and a Remineralizing Gel on the Enamel and Dentin Ultrastructure and Hardness. Am J Dent 2011;24:131-137. Universidade de São Paulo, São Paulo, Brazil

Objective

To investigate the influence of calcium phosphate-enhanced home whitening agents on human enamel and dentin surface microhardness and ultramorphology.

Materials

- Ten intact molar crowns
- 15% carbamide peroxide + potassium nitrate + fluoride (Opalescence PF, Ultradent)
- 16% carbamide peroxide + potassium nitrate + fluoride (Whiteness Perfect, FGM)
- Potassium nitrate + fluoride + calcium + phosphate (Relief ACP, Discus Dental)
- 16% carbamide peroxide + potassium nitrate + calcium + phosphate (NiteWhite ACP, Discus Dental)
- 7.5% hydrogen peroxide + potassium nitrate + calcium + phosphate (DayWhite ACP, Discus Dental)
- 7.5% hydrogen peroxide + potassium nitrate + fluoride + calcium (White Class Ca, FGM)

Methodology

Five intact molar crowns were used for ultrastructural analysis and five for microhardness tests. Each resulting coronal structure was cut in slices. After measuring the baseline Knoop Hardness Number (KHN) of the enamel and dentin, the slices were divided into six experimental groups and one control group (n=5). The groups were as follows: G1 = 15% CP; G2 = 16% CP; G3 = Ca and PO4; G4 = 16% CP with Ca and POH4; G6 = 7.5% HP with Ca.

Results

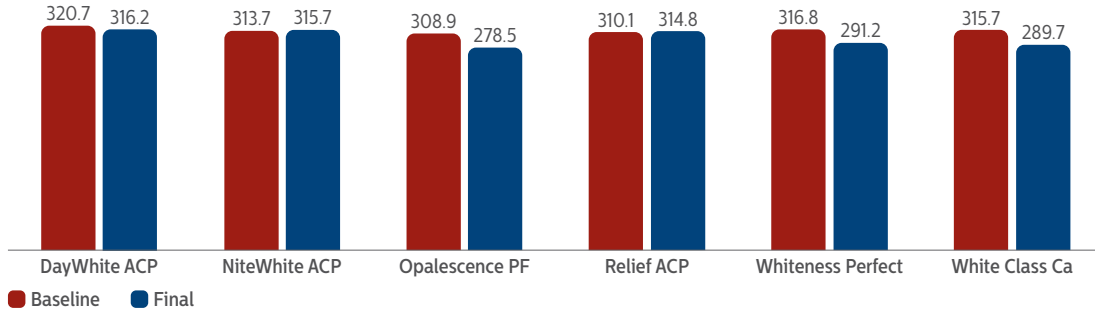
Conventional whitening agents (G1, G2) and the gel with calcium (G6) cause KHN decrease ($p < 0.05$). The remineralizing and whitening agents with calcium and phosphate (G3, G4, G5) did not change KHN. A change in morphology was observed on dentin surfaces in G1, G2, and G5.

Conclusion

The results indicated that the gels with calcium and phosphate added did not change the superficial enamel and dentin hardness nor did it change the tooth morphology. The conventional whitening gels that did not have remineralizing agents added to the formulation showed decreases on superficial hardness of enamel and dentin as well as morphological changes on tooth structure.

Mean Enamel Hardness Before and After Treatment

KHN



Mean Dentin Hardness Before and After Treatment

KHN

