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ZOOM!

Take-home

Benefits of ACP

in vitro study

Whitening Agents with ACP: Enamel Caries Formation and Progression

Hicks J, Flaitz C. Whitening Agents with ACP: Enamel Caries Formation and Progression. J Dent Res 85 (Spec Iss A), 0882, 2006.

Objective

To evaluate the effect of whitening agents containing amorphous calcium phosphate (ACP) on human enamel caries formation and progression

Materials

- 15 human teeth
- 9.5% hydrogen peroxide ACP (DayWhite Excel 3, Discus Dental)
- 6% hydrogen peroxide ACP (NiteWhite Turbo, Discus Dental)
- 16% carbamide peroxide ACP (NiteWhite, Discus Dental)

Methodology

Fifteen teeth with sound enamel surfaces were divided into four portions. Each tooth portion was assigned to a treatment group: Group 1) No Treatment Control; Group 2) DayWhite Excel 3 9.5% hydrogen peroxide ACP; Group 3) NiteWhite Turbo 6% hydrogen peroxide ACP; Group 4) NiteWhite 16% carbamide peroxide ACP. The teeth were treated according to the manufacturer's recommendations followed by synthetic saliva, on a daily basis for 14 days. Control tooth portions were exposed only to synthetic saliva. A modified ten Cate solution was used for in vitro enamel caries formation and progression. The teeth were treated prior to lesion formation, and before lesion progression 1 and lesion progression 2 periods. Longitudinal sections were taken after lesion formation, lesion progression 1 and lesion progression 2 periods for polarized light study and statistical analysis (ANOVA, DMR).

Results

Mean lesion depths were:

- Lesion Formation Period: Control 108±15um; DayWhite 93±11um; NiteWhite Turbo 48±7um (P<.05); NiteWhite 16% 105±12um.
- Progression Period 1: Control 171±18um; DayWhite 126±13um (P<.05); NiteWhite Turbo 96±9um (P<.05); NiteWhite 16% 132±12um (P<.05).
- Progression Period 2: Control 228±20um; DayWhite 165±17um (P<.05); NiteWhite Turbo 129±11um (P<.05); NiteWhite 16% 152±16um (P<.05).

Conclusion

Whitening agents containing calcium phosphate have a reduced susceptibility to in vitro enamel caries lesion initiation and progression.

Mean Lesion Depths

	Group 1: Control	Group 2: DayWhite Excel 3 - 9.5% hydrogen peroxide ACP	Group 3: NiteWhite Turbo 6% hydrogen peroxide ACP	Group 4: NiteWhite 16% carbamide peroxide ACP
Lesion Formation Period	108±15um	93±11um(P<.05)	48±7um (P<.05)	105±12um(P<.05)
Progression Period 1	171±18um	126±13um(P<.05)	126±13um(P<.05)	132±12um (P<.05)
Progression Period 2	228±20um	165±17um (P<.05)	129±11um (P<.05)	152±16um (P<.05)

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[1] Martin Giniger & Company, New York, NY, USA,
[2] Discus Dental, Culver City, CA, USA