
Title

Effects of alpha-tocopherol antioxidant on fracture strength and adhesion of endodontically treated teeth restored after dental bleaching

Abstract

This study evaluated the effect of different concentrations of alpha-tocopherol in gel form on fracture strength, hybrid layer formation, and microtensile bond strength of endodontically treated teeth bleached with 40% hydrogen peroxide (H₂O₂). Sixty bovine incisors were randomized into one of six groups (n = 10 incisors per group) defined by the interventions carried out after endodontic treatment. In the control group, no additional intervention was carried out, while all teeth in the five intervention groups were bleached with 40% H₂O₂ and subsequently treated with alpha-tocopherol at concentrations of 15% (15AT), 20% (20AT), or 25% (25AT), with 10% sodium ascorbate (10SA), or with nothing (40HP). Fracture strength was evaluated in a mechanical testing machine, hybrid layer formation was assessed using scanning electron microscopy, and bond strength was determined using microtensile bond-strength testing. Data were analyzed using Kruskal-Wallis and Dunn's tests. No statistically significant difference regarding fracture strength was observed among groups. Hybrid layer formation was greater in the 15AT group than in groups 40HP and 10SA. Teeth in groups 15AT, 20AT, and 25AT demonstrated higher bond strength than teeth in groups 40HP and 10SA. Alpha-tocopherol, preferably at 15%, effectively reverses the deleterious effects, of bleaching, on hybrid layer formation and bond strength to dentin. © 2023 Scandinavian Division of the International Association for Dental Research. Published by John Wiley & Sons Ltd.

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Year

2024

Source title

European Journal of Oral Sciences

Volume

132.0

Issue

1

Art. No.

e12965

Cited by

3

DOI

10.1111/eos.12965

Link

<https://www.scopus.com/inward/record.uri?eid=2-s2.0-85180218958&doi=10.1111%2feos.12965&partnerID=40&md5=3d5d4cc8ebf34266443e6774954264b8>

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Author Keywords

adhesive systems; bond strength; hybrid layer; hydrogen peroxide; sodium ascorbate

Index Keywords

alpha-Tocopherol; Animals; Antioxidants; Cattle; Composite Resins; Dental Bonding; Flexural Strength; Hypochlorous Acid; Tooth Bleaching; Tooth, Nonvital; alpha

tocopherol; antioxidant; hypochlorous acid; resin; animal; bovine; chemistry; dental bonding; dental procedure; flexural strength; tooth pulp disease

Chemicals/CAS

alpha tocopherol, 1406-18-4, 1406-70-8, 52225-20-4, 58-95-7, 59-02-9; hypochlorous acid, 7790-92-3; alpha-Tocopherol, ; Antioxidants, ; Composite Resins, ; Hypochlorous Acid,

Funding Details

Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, CAPES

Funding Texts

This study was financed, in part, by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)—Finance code 001.

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Publisher

John Wiley and Sons Inc

ISSN

09098836

PubMed ID

38115770.0

Language of Original Document

English

Abbreviated Source Title

Eur. J. Oral Sci.

Document Type

Article

Publication Stage

Final

Source

Scopus

EID

2-s2.0-85180218958