

EFFICACY OF 35% HYDROGEN PEROXIDE ON HUMAN ENAMEL: IN VITRO EVALUATION IN DIFFERENT TOOTH AREAS

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ABSTRACT

This study aimed to assess the efficacy of a 35% hydrogen peroxide – based gel without activation in vitro on three areas of the tooth surface. Vestibular faces of human premolar teeth were darkened, followed by two whitenings at 7-day intervals. The efficacy of whitening was determined in the cervical third, medium third and incisal third of the tooth surface with an Easyshade-Vita spectrophotometer based on the CIELab system. The L, a*, b* parameters were determined for each third by the identification of high luminosity and hues tending to green and yellow; pigmentation luminosity was then reduced, and the parameters a* and b* became reddish and yellowish, respectively. Seven days after the first whitening, there were*

significant improvements in L and a* values. Seven days after the second whitening, the three parameters returned to values close to the initial values; the b* parameter was most strongly correlated with whitening efficacy. DE values revealed a visually perceptible difference.*

There was a satisfactory removal of pigmentation after both whitenings, while the lack of uniformity among the tooth-surface thirds after the first session justified the performance of two whitening procedures. With regard to each third, DE indicated a visibly perceptible difference, although L, a* and b* values showed no statistically significant differences.*

Key words: teeth whitening; hydrogen peroxide; darkening.

EFICÁCIA DO PERÓXIDO DE HIDROGÊNIO A 35% SOBRE O ESMALTE DENTÁRIO HUMANO

RESUMO

Objetivo: Avaliar, in vitro, a eficácia do gel do peróxido de hidrogênio a 35%, sem ativação, nos três terços dentários. Faces vestibulares de dentes pré-molares humanos foram escurecidos, seguindo-se de duas sessões de clareamento com intervalos de 7 dias. A eficácia do clareamento foi determinada no terço cervical, terço médio e terço incisal pelo espectrofotômetro Easyshade-Vita, com base no sistema CIELab. Os parâmetros L, a*, b* determinados em cada um terço revelaram alta luminosidade e tendência aos tons verde e amarelo; após a pigmentação, a luminosidade foi reduzida e os parâmetros a* e b* revelaram as tonalidades avermelhada e amarelada. 7 dias após o primeiro clareamento houve uma melhora significativa dos parâmetros L* e a*. 7 dias após o*

segundo clareamento, os três parâmetros retornaram aos valores próximos àqueles iniciais, sendo que o parâmetro b foi o principal fator responsável pela eficácia de clareamento. Os valores referentes ao parâmetro DE indicaram haver percepção visual. A remoção da pigmentação foi satisfatória após os dois clareamentos, sendo que a falta de uniformidade entre os terços após a primeira sessão justificou a realização de dois procedimentos de clareamento. Em relação a cada terço, o parâmetro DE mostrou percepção visual, embora os valores de L*, a* e b* não demonstraram diferenças estatisticamente significativas.*

Palavras chave: clareamento dentário; peróxido de hidrogênio; escurecimento.

INTRODUCTION

Attention to aesthetic rehabilitation in dentistry has become a growing concern worldwide. However, having white, well-formed, well taken care of and well-aligned teeth requires more than attendance to aesthetic requirements to the extent that such conditions are important indicators of oral health.

Exogenous dental staining is caused by ingestion of food and beverages containing coloring substances such as tea, coffee, cola-based sodas, mate, red

wine, and beets. Exogenous dental staining is also associated with the deposition of dental plaque¹. Tooth whitening is the recommended treatment for these enamel alterations².

As a dentistry procedure designed for dental rehabilitation, whitening procedures have spread widely due to their benefits with regard to enamel and dental crown preservation.

The chemical whitening process consists of an oxidation-reduction reaction; the amount of pigment removed is proportional to the duration of enamel