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The whitening effect of chlorine dioxide-An in vitro study.

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Source

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Abstract

OBJECTIVES:

The aim of this study was to investigate the whitening properties and rate of bleaching action of chlorine dioxide and compare them with those of hydrogen peroxide of similar concentration.

METHODS:

Sixty bovine central incisor crowns were ground and polished until flat surfaces were obtained. The crowns were subjected to extensive staining cycles of artificial saliva, chlorhexidine and tea before being randomly assigned to three groups: chlorine dioxide (ClO₂), hydrogen peroxide (H₂O₂) and deionised water (H₂O). The crowns in each group were subjected to seven 2min exposure cycles in addition to an extra 30min cycle. CIE LAB spectrophotometric measurements were taken at baseline, after each 2min, and each extended 30min bleaching cycle.

RESULTS:

L* for ClO₂ specimens was significantly higher only after the first 2min cycle ($p < 0.001$) while for H₂O₂ specimens, L* significantly increased after the first two cycles ($p < 0.001$) and continued to increase, at a slower rate, until the end of the treatment cycles. ΔE was significantly greater within H₂O₂ than within ClO₂ specimens ($p < 0.001$).

CONCLUSION:

Chlorine dioxide whitens teeth at a faster rate than hydrogen peroxide. Specimens treated with chlorine dioxide were significantly lighter than those treated with hydrogen peroxide at the end of the first 2min application cycle, however, extended exposures did not enhance colour.

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