An Analysis of Dental Enamel after Bleaching using 35% Hydrogen Peroxide with Energy-dispersive X-ray Spectroscopy

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ABSTRACT

Background: Hydrogen peroxide (H$_2$O$_2$) is an effective bleaching agent of tooth whitening, but its use causes changes in the chemical composition of the elements that configure tooth enamel. The purpose of this study is to determine whether there are changes in the composition of the elements that configure the tooth enamel after bleaching using 35% hydrogen peroxide.

Materials and methods: This study was performed in vitro, which is an experimental research laboratory with controlled time series design. The samples used in this study were six permanent incisors postextraction and are divided into treatment and control groups. The control group was soaked in saline and treatment groups applied with hydrogen peroxide 35%, with time series of 1, 1.5, 2, 2.5, and 3 hours. The elemental composition of enamel was observed using energy-dispersive X-ray spectroscopy analysis; results can be obtained both qualitatively and quantitatively. This study was analyzed using non-parametric test (Kruskal–Wallis test) to determine changes in enamel composition after bleaching, whether No perubahan komposit these elements.

Result: The results of this study showed a p-value of 0.406 (p < 0.05; significant). The result shows a change in the composition of dental enamel after bleaching using 35% hydrogen peroxide.

Conclusion: Application of 35% hydrogen peroxide as the bleaching agent does not have a significant influence on changes in the composition of the elements contained in the enamel.

Keywords: 35% hydrogen peroxide, Bleaching, Composition of dental enamel.


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INTRODUCTION

Enamel is the hardest tissue of teeth, which is the outer layer of the tooth crown. The thickness and density...