

PENGARUH APLIKASI BAHAN *BLEACHING* KOMBINASI ASAM MALAT 1% DAN NATRIUM BIKARBONAT 10% TERHADAP KADAR PELEPASAN ION FOSFAT GIGI

INTISARI

Bleaching merupakan tindakan untuk mengatasi masalah estetika terkait warna gigi tanpa memerlukan pembedahan. Teknik ini umumnya dilakukan melalui aplikasi bahan berbasis peroksida pada permukaan gigi yang berubah warna. Penelitian terdahulu mengungkapkan penggunaan asam malat tidak menunjukkan perbedaan yang signifikan dengan karbamid peroksida sehingga diperlukan penambahan natrium bikarbonat sebagai agen pengkondisi pH. Tujuan penelitian ini adalah untuk mengetahui pengaruh aplikasi bahan *bleaching* kombinasi asam malat dan natrium bikarbonat terhadap kadar pelepasan ion fosfat gigi.

Spesimen penelitian yang digunakan adalah 9 gigi premolar rahang atas dengan mahkota utuh dan bebas karies. Diskolorasi dilakukan dengan perendaman pada larutan kopi selama 12 hari. Spesimen gigi dipotong menjadi dua bagian yaitu mesial dan distal. Gigi bagian mesial digunakan untuk uji kadar fosfat awal, sedangkan gigi bagian distal untuk uji kadar fosfat akhir. Spesimen dibedakan menjadi tiga kelompok perlakuan, yaitu karbamid peroksida 10%, asam malat 1%, dan kombinasi asam malat 1% dengan natrium bikarbonat 10%. Bahan *bleaching* diaplikasikan 6 jam per hari selama 12 hari. Spesimen disimpan dalam inkubator dengan suhu 37°C. Pengukuran kadar ion fosfat dalam gigi dilakukan menggunakan Spektrofotometri UV-Vis.

Hasil uji *Shapiro Wilk* menunjukkan data terdistribusi normal. Hasil uji Levene Test menunjukkan data memiliki variasi yang homogen. Uji *One-Way ANOVA* menunjukkan bahwa bahan *bleaching* karbamid peroksida 10%, asam malat 1%, dan kombinasi asam malat 1% dengan natrium bikarbonat 10% berpengaruh secara signifikan terhadap jumlah pelepasan ion fosfat gigi. Uji *Post Hoc* menunjukkan adanya pengaruh aplikasi bahan kombinasi asam malat 1% dan natrium bikarbonat 10% terhadap pelepasan ion fosfat gigi.

Kata kunci: *bleaching*, karbamid peroksida 10%, asam malat 1%, natrium bikarbonat 10%, ion fosfat gigi.

EFFECT OF 1% MALIC ACID AND 10% SODIUM BICARBONATE BLEACHING COMBINATION ON TOOTH PHOSPHATE ION RELEASE

ABSTRACT

Bleaching was a procedure employed to address aesthetic concerns pertaining to tooth coloration that did not necessitate surgical intervention. This technique was typically implemented through the application of peroxide-based materials onto the surface of discolored teeth. A previous study revealed that the use of malic acid did not demonstrate a significant difference when compared with carbamide peroxide. Therefore, the addition of sodium bicarbonate as a pH conditioning agent was deemed necessary. The objective of this study was to determine the effect of the application of bleaching materials combined with malic acid and sodium bicarbonate on the levels of tooth phosphate ion release.

The research specimens used were nine maxillary premolars with intact and caries-free crowns. The teeth were immersed in a coffee solution for 12 days to induce discoloration. The teeth were bisected, with the mesial teeth serving as the initial phosphate test specimens and the distal teeth used for the final phosphate test. The specimens were then divided into three groups for treatment: 10% carbamide peroxide, 1% malic acid, and a combination of 1% malic acid and 10% sodium bicarbonate. Bleaching agents were applied for a total of 12 days, with a daily application of 6 hours. The specimens were stored in an incubator maintained at 37°C. The measurement of phosphate ion levels in the teeth was performed using UV-Vis spectrophotometry.

The results of the Shapiro-Wilk test indicated that the data were normally distributed, while the results of the Levene test demonstrated that the data exhibited homogeneous variation. The one-way ANOVA test demonstrated that the bleaching agents carbamide peroxide 10%, malic acid 1%, and a combination of malic acid 1% and sodium bicarbonate 10% had a significant effect on the amount of dental phosphate ion release. The Post Hoc test revealed that the application of a combination of 1% malic acid and 10% sodium bicarbonate affected the release of dental phosphate ions.

Keywords: bleaching, carbamide peroxide 10%, malic acid 1%, sodium bicarbonate 10%, tooth phosphate ion.