ABSTRACT

Sodium hypochlorite is the most frequent used irrigation solution. However, complications also occur in the use of NaOCl because of its cytotoxicity levels, and the degree of demineralization that affects dentin microhardness. Siwak (Salvadora persica) is often used in dentistry. Fluoride, calcium, and phosphorus in siwak can inhibit demineralization and induce remineralize teeth. The aim of this study was to compare the application of siwak extract irrigation with the application of 3% NaOCl against alteration in root canal microhardness.

This study was an in vitro analytical experimental laboratory. In this research premolar teeth were placed inside the resin blocks. The teeth were trimed from the cementoenamel junction until to the opened root canal. Samples were treated by root canal preparation using different irrigation materials (3% NaOCl, 25% siwak extract, 30% siwak extract, and 35% siwak extract). Before and after treatment the samples were measured using the Vickers tool to determine the initial hardness (VHN_0) and the final hardness (VHN_1).

Decreasing microhardness occurred in group I-III, while for group IV there was increasing in microhardness. The results of the Wilcoxon showed that there was a significant change ($p < 0.05$) from the application of irrigation solutions to microhardness. The ANOVA test results showed significant differences ($p > 0.05$) between irrigation solutions of 3% NaOCl, 25% siwak extract, 30% siwak extract, and 35% siwak extract.

The most decreasing microhardness was 3% NaOCl, followed by siwak extract 25%, siwak extract 30%, while 35% in siwak extract group increased dentine microhardness.

Keywords: Siwak extract, Salvadora persica, Sodium hypochlorite, Irrigation solution, Microhardness dentin, Root canal preparation

ABSTRAK

Sodium hipoklorit merupakan larutan irigasi yang paling sering digunakan. Meskipun demikian, komplikasi juga terjadi dalam penggunaan NaOCl karena kadar sitotoksiknya, dan derajat demineralisasi yang mempengaruhi kekerasan mikro dentin. Siwak (*Salvadora persica*) sering digunakan dalam bidang kedokteran gigi. Fluoride, kalsium, dan fosfor dalam siwak dapat menghambat demineralisasi dan membantu remineralisasi gigi. Tujuan penelitian ini untuk mengetahui perbandingan penggunaan larutan irigasi ekstrak siwak dengan NaOCl 3% terhadap perubahan kekerasan mikro dentin saluran akar.

Jenis penelitian ini adalah analitik eksperimental laboratoris *in vitro.* Pada penelitian ini gigi premolar ditanam dalam *resin block*. Gigi dipotong sebatas *cementoenamel junction* hingga saluran akar terbuka. Sampel diberikan perlakuan preparasi saluran akar menggunakan bahan irigasi yang berbeda-beda (NaOCl 3%, ekstrak siwak 25%, ekstrak siwak 30%, dan ekstrak siwak 35%). Sebelum dan setelah perlakuan sampel di ukur dengan menggunakan alat *Vickers* untuk mengetahui kekerasan awal (VHN_0) dan kekerasan akhir (VHN_1).

Penurunan kekerasan mikro terjadi pada kelompok I-III, sedangkan untuk kelompok IV terjadi peningkatan kekerasan mikro. Hasil analisis uji *Wilcoxon* menunjukkan terjadi perubahan secara signifikan ($p<0,05$) dari penggunaan larutan irigasi terhadap kekerasan mikro. Hasil uji ANOVA adalah terdapat perbedaan yang signifikan ($p>0,05$) antara larutan irigasi NaOCl 3%, ekstrak siwak 25%, ekstrak siwak 30%, dan ekstrak siwak 35%.

Penurunan kekerasan mikro tertinggi pada NaOCl 3%, diikuti dengan ekstrak siwak 25%, ekstrak siwak 30%, sedangkan pada kelompok ekstrak siwak 35% terjadi peningkatan kekerasan mikro dentin.

Kata kunci: Ekstrak Siwak, *Salvadora persica*, Sodium hipoklorit, Larutan irigasi, Kekerasan mikro dentin, Preparasi saluran akar