PENGARUH *RECHARGING* PADA KOMPOSIT BIOAKTIF TERHADAP PELEPASAN ION FLUOR DALAM SALIVA BUATAN pH ASAM

INTISARI

Aplikasi topikal fluor pada permukaan restorasi diketahui dapat menambah kandungan ion fluor sehingga dapat memperpanjang efek terapeutik dari material restorasi. Hal ini sangat dibutuhkan selama tidak menimbulkan efek merugikan terhadap sifat fisik dan mekanik pada material. Penelitian ini bertujuan untuk mengetahui pengaruh *recharging* pada komposit bioaktif terhadap kemampuan pelepasan ion fluor dalam saliva buatan pH asam.

Jumlah sampel penelitian adalah sebanyak 75 buah komposit bioaktif (*ACTIVA, Bioactive-Restorative*) dibagi menjadi 15 kelompok (n=5/kelompok) berdasarkan lama perendaman. Dua puluh lima sampel diukur sebelum *recharging*. Dua puluh lima sampel diambil untuk dilakukan *recharging* dan 25 lainnya tidak dilakukan *recharging*. *Sodium fluoride* 5% digunakan sebagai bahan *recharging* yang dilakukan dengan cara mengaplikasikan bahan ke seluruh permukaan material dan didiamkan selama 4 menit. Seluruh sampel direndam dalam larutan saliva buatan dengan pH 4,5 disimpan di dalam inkubator suhu 37^{o}C. Kemampuan pelepasan ion fluor dihitung berdasarkan lama perendaman 12 jam, 24 jam, 2 hari, 4 hari dan 7 hari menggunakan spektrofotometri *UV-Vis*. Seluruh data yang diperoleh dianalisis menggunakan ANAVA dan uji lanjutan *Games Howell*.

Hasil analisis menunjukkan bahwa *recharging* berpengaruh terhadap kemampuan pelepasan ion fluor pada material komposit bioaktif ($p<0,05$). Hasil analisis uji *post hoc Games Howell* menunjukkan perbedaan yang signifikan antara kelompok. Kesimpulan dari penelitian ini adalah *recharging sodium fluoride* pada komposit bioaktif berpengaruh terhadap kemampuan pelepasan ion fluor pada material komposit bioaktif.

Kata kunci: *Recharging*, komposit bioaktif, pelepasan ion fluor.

FLUORIDE RELEASE AND RECHARGE OF BIOACTIVE COMPOSITE IN ACIDIC ARTIFICIAL SALIVA

ABSTRACT

Topical application of fluoride on the surface of restoration is known to increase the content of fluoride ions in the material and thus prolong the therapeutic effect of the restoration material. This is necessary as long as it does not cause adverse effects on the physical and mechanical properties of the material. This study aims to determine the effect of recharging on bioactive composites on the ability to release fluoride ions in acidic pH artificial saliva.

Seventy-five samples were prepared from bioactive composites (*ACTIVA, Bioactive Restorative*) and then equally divided into 15 groups (n=5/group), representing the time interval of measurement. Twenty-five samples were measured before recharging. Twenty-five samples were taken for recharging and another 25 were recharged. The recharging process is carried out by applying 5% sodium fluoride. The entire samples immersed in an artificial saliva solution with a pH of 4.5 was stored in an incubator with a temperature of 37^{o}C. The release rate of fluoride ions was calculated based on the immersion time of 12 hours, 24 hours, 2 days, 4 days, and 7 days using UV-Vis spectrophotometry. All data obtained were analyzed using ANOVA and post hoc tests of Games Howell.

The results of the analysis showed that there was a significant effect of recharging sodium fluoride on the release ability of fluoride ions from bioactive composite materials ($p<0.05$). The results of the post hoc test analysis Games Howell showed significant differences between groups. This study concludes that recharging sodium fluoride in bioactive composites affects the ability to release fluoride ions in bioactive composite materials.

Keywords: Recharging, composite bioactive, ion fluoride release