

PELEPASAN ION KALSIUM RESIN MODIFIED GLASS IONOMER CEMENT DAN ENHANCED RESIN MODIFIED GLASS IONOMER CEMENT DALAM SALIVA pH ASAM DENGAN LAMA PERENDAMAN 14, 21, 28 HARI

INTISARI

Resin *modified glass ionomer cement* (RMGIC) dan *enhanced resin modified glass ionomer cement* (ERMGIC) merupakan bahan restorasi bioaktif yang dapat melepaskan ion kalsium untuk menghambat proses demineralisasi pada rongga mulut yang asam. Penelitian ini bertujuan mengetahui jumlah pelepasan ion kalsium dari RMGIC dan ERMGIC yang direndam dalam saliva buatan pH asam selama 14, 21, dan 28 hari.

Spesimen terdiri dari 2 kelompok bahan, yaitu kelompok RMGIC (I) dan ERMGIC (II) dan dibagi kembali menjadi 3 subkelompok berdasarkan lama perendaman, yaitu 14 hari (A), 21 hari (B), dan 28 hari (C) dengan delapan spesimen setiap subkelompok. Spesimen berbentuk silinder berdiameter 15 mm dan ketebalan 1 mm direndam pada 10 mL saliva pH 4,5. Spektrofotometer UV-Vis digunakan untuk menghitung jumlah pelepasan ion kalsium ($\lambda=516$ nm). Data diuji normalitas (uji Shapiro-Wilk), homogenitas (Levene's Test), kemudian dilanjutkan dengan Uji Anava 2 jalur dan Tukey's Post-hoc HSD ($\alpha=0,05$).

Hasil uji anava 2 jalur membuktikan jenis bahan restorasi dan lama perendaman berpengaruh terhadap jumlah pelepasan ion kalsium ($p<0,05$) dan tidak terdapat interaksi antara keduanya ($p>0,05$). Uji *Tukey* menunjukkan perbedaan bermakna antara RMGIC dan ERMGIC pada hari ke-21 dan ke-28, namun tidak pada hari ke-14. Lama perendaman 14 hari memiliki perbedaan bermakna terhadap 21 hari dan 28 hari, namun pada 21 hari terhadap 28 hari tidak berbeda.

Material ERMGIC memiliki rerata jumlah pelepasan ion kalsium lebih tinggi daripada RMGIC pada semua waktu uji, jumlah rerata ion kalsium semakin meningkat pada lama perendaman yang semakin lama, dan tidak ada interaksi antara bahan restorasi dengan lama perendaman.

Kata kunci: *enhanced resin modified glass ionomer cement*, ion kalsium, *resin modified glass ionomer cement*, lama perendaman, saliva pH asam

**CALCIUM ION RELEASE OF RESIN MODIFIED GLASS IONOMER
CEMENT AND ENHANCED RESIN MODIFIED GLASS IONOMER
CEMENT IN ACIDIC SALIVARY pH WITH IMMERSION
PERIOD OF 14, 21, 28 DAYS**

ABSTRACT

Resin modified glass ionomer cement (RMGIC) and enhanced resin modified glass ionomer cement (ERMGIC) are bioactive restorative materials that capable of releasing calcium ions to inhibit demineralization in acidic oral environments. The aim of this study was to determine the amount of calcium ion release from RMGIC and ERMGIC immersed in acidic saliva for 14, 21, and 28 days.

The specimens were divided into two material groups, RMGIC (I) and ERMGIC (II), and further subdivided into three subgroups based on immersion time: 14 days (A), 21 days (B), and 28 days (C), and each subgroup consisting of 8 specimens. The specimens shaped as cylinders with a diameters of 15 mm and a thickness of 1 mm were immersed in 10 mL of saliva at pH 4,5. A UV-Vis spectrofotometer was used to measure calcium ion release ($\lambda=516$ nm). Data were tested for normality (Shapiro-Wilk test) and homogeneity (Levene's Test), followed by two-way ANOVA and Tukey's HSD Post-hoc test ($\alpha=0,05$).

Two-way ANOVA test demonstrated that both the type of restorative material and immersion time significantly affected calcium ion release ($p<0,05$), while no interaction was found between the type of restorative material and immersion time ($p>0,05$). Tukey's test showed significantly differences between RMGIC and ERMGIC on 21 days and 28 days, but not on day 14. Immersion for 14 days showed significant differences compared to 21 days and 28 days, while there was no significant difference between 21 days and 28 days.

The mean calcium ion release of ERMGIC was higher than RMGIC at all time points, the calcium ion release progressively increased with prolonged immersion, and no interaction was observed between the material type and immersion time.

Keywords: enhanced resin modified glass ionomer cement, calcium ion, resin modified glass ionomer cement, immersion time, acidic pH saliva