KELARUTAN BAHAN RESTORASI *RESIN MODIFIED GLASS-IONOMER CEMENT* DAN *ENHANCED RESIN MODIFIED GLASS-IONOMER CEMENT* DALAM LARUTAN *SIMULATED BODY FLUID*

INTISARI

Resin Modified Glass-Ionomer Cement (RMGIC) dan *Enhanced Resin Modified Glass-Ionomer Cement* (ERMGIC) adalah bahan restorasi penting dan relatif baru dalam kedokteran gigi yang digunakan dalam berbagai aplikasi restoratif, namun interaksi bahan ini dengan lingkungan rongga mulut belum sepenuhnya diketahui. Keawetan suatu bahan dapat dievaluasi melalui sifat kimia salah satunya adalah kelarutan. Pada penelitian ini lingkungan simulasi tubuh direpresentasikan oleh larutan *Simulated Body Fluid (SBF).* Tujuan penelitian ini adalah untuk mengetahui kelarutan *resin modified glass-ionomer cement* dan *enhanced resin modified glass-ionomer cement* dalam larutan *simulated body fluid.*

Subjek pada penelitian ini terbagi menjadi dua kelompok yaitu kelompok I adalah *Resin Modified Glass-Ionomer Cement* (RMGIC) dan kelompok II adalah *Enhanced Resin Modified Glass-Ionomer Cement* (ERMGIC). Jumlah spesimen pada masing-masing kelompok adalah RMGIC (n=10) dan ERMGIC (n=10) sehingga jumlah total spesimen adalah (n=20). Bentuk dan ukuran spesimen yaitu berbentuk silinder dengan diameter 15 mm dan tebal 1 mm yang kemudian dilakukan perendaman pada larutan *simulated body fluid* pada suhu 37^{o}C selama 24 jam. Spesimen dilakukan pengeringan ke dalam desikator kemudian ditimbang untuk mendapatkan massa akhir. Uji kelarutan diukur berdasarkan standar ISO 4049:2009. Data dari penelitian ini dianalisis dengan menggunakan uji *Independent t-test* (α=0,05).

Hasil analisis statistik *Independent t-test* menunjukkan bahwa terdapat perbedaan yang signifikan ($p<0,05$) kelarutan kedua kelompok perlakuan RMGIC dan ERMGIC setelah dilakukan perendaman dalam larutan SBF selama 24 jam. Kesimpulan penelitian ini adalah kelarutan RMGIC lebih tinggi dibandingkan ERMGIC dalam perendaman larutan *Simulated Body Fluid* (SBF) selama 24 jam.

Kata kunci: kelarutan, *resin modified glass-ionomer cement*, *enhanced resin modified glass ionomer-cement*, *simulated body fluid*.

SOLUBILITY OF RESTORATION MATERIALS *RESIN MODIFIED GLASS-IONOMER CEMENT* AND *ENHANCED RESIN MODIFIED GLASS-IONOMER CEMENT* IN *SIMULATED BODY FLUID* SOLUTION

ABSTRACT

Resin Modified Glass-Ionomer Cement (RMGIC) and Enhanced Resin Modified Glass-Ionomer Cement (ERMGIC) are important and relatively new restorative materials in dentistry that are used in a variety of restorative applications, however, the interaction of these materials with the oral environment is not fully understood. The durability of a material can be evaluated through its chemical properties, one of which is solubility. In this research, the body simulation environment is represented by a Simulated Body Fluid (SBF) solution. The aim of this research is to determine the solubility of resin modified glass-ionomer cement and enhanced resin modified glass-ionomer cement in a simulated body fluid solution.

The subjects in this study were divided into two groups, namely group I was Resin Modified Glass-Ionomer Cement (RMGIC) and group II was Enhanced Resin Modified Glass-Ionomer Cement (ERMGIC). The number of specimens in each group is RMGIC (n=10) and ERMGIC (n=10) so the total number of specimens is (n=20). The shape and size of the specimen is cylindrical with a diameter of 15 mm and a thickness of 1 mm, which is then immersed in a simulated body fluid solution at a temperature of 37^{o}C for 24 hours. The specimens were dried in a desiccator and then weighed to obtain the final mass. The solubility test is measured based on the ISO 4049:2009 standard. Data from this study were analyzed using the Independent t-test (α=0.05).

The results of the independent t-test statistical analysis showed that there was a significant difference ($p<0.05$) in the solubility of the two RMGIC and ERMGIC treatment groups after immersion in the SBF solution for 24 hours. The conclusion of this research is that the solubility of RMGIC is higher than ERMGIC when immersed in a Simulated Body Fluid (SBF) solution for 24 hours.

Keywords: solubility, resin modified glass-ionomer cement, enhanced resin modified glass-ionomer cement, simulated body fluid.