

INTISARI

Perawatan ortodonti sering kali menggunakan bahan adhesif, terutama pada alat ortodonti cekat. Bahan adhesif ortodonti salah satunya yaitu semen ionomer kaca modifikasi resin (SIKMR) yang dapat melepas *fluoride* namun belum mampu untuk menghambat bakteri penyebab karies, sehingga diperlukan tambahan bahan yang dapat menjadi agen antibakteri seperti arginin. Arginin memberikan kapasitas penyangga berbasis prebiotik untuk mencegah terjadinya karies. Arginin 4% yang dicampur ke dalam bahan adhesif terbukti efektif dalam menghambat bakteri penyebab karies. Pasien dengan perawatan ortodonti memiliki prevalensi lebih tinggi untuk mengalami terjadinya karies. Bakteri utama yang berperan dalam perkembangan karies adalah *Streptococcus mutans*. Tujuan dari penelitian ini adalah untuk mengetahui pengaruh penambahan arginin 4% terhadap potensi kemampuan antibakteri dari SIKMR ortodonti.

Penelitian menggunakan sampel specimen SIKMR dan SIKMR dengan tambahan arginin 4%. Spesimen direndam pada suspensi bakteri sesuai standar McFarland 0,5 selama 24 jam. Spesimen yang sudah direndam dimasukkan ke dalam NaCl untuk di *vortex*. Hasil *vortex* dilakukan pengenceran 10^{-4} dalam larutan NaCl kemudian ditanam dalam media agar *brain heart infusion* (BHI). Jumlah koloni bakteri setelah inkubasi 24 jam dihitung dengan *colony counter*.

Hasil uji *independent T-test* menunjukkan adanya perbedaan yang signifikan ($p < 0,05$) antar kelompok uji atau penambahan arginin bermakna terhadap jumlah bakteri *S. mutans*. Kesimpulan dari penelitian ini adalah penambahan arginin 4% ke dalam SIKMR ortodonti mampu menghambat pertumbuhan bakteri *S. mutans*.

Kata kunci: semen ionomer kaca modifikasi resin, arginin, *Streptococcus mutans*

ABSTRACT

Orthodontic treatment often used adhesive materials, especially on fixed orthodontic devices. One of the orthodontic adhesive materials are resin-modified glass ionomer cement (RMGIC) which can released fluoride but has not been able to prevent caries causing bacteria, so additional ingredients are needed that could be antibacterial agents such as arginine. Arginine provided a prebiotic based buffering capacity to prevent caries. Arginine 4% was blended into the adhesive material and proved to be an effective inhibitor of caries causing bacteria. Patients with orthodontic treatment have a higher prevalence of caries. The main bacteria that contribute to the caries progression are *Streptococcus mutans*. The purpose of this study was to determine the effect of the addition of 4% arginine on the potential antibacterial ability of orthodontic RMGIC.

The study used samples of RMGIC and RMGIC specimens with 4% arginine added. The specimens were immersed in a suspension of bacteria according to the McFarland 0.5 standard for 24 hours. Specimens that have been soaked are put into NaCl to be vortexed. The results of the vortex were diluted up to 10^{-4} in NaCl solution and then drop onto brain hearth infusion (BHI) agar media. The number of bacterial colonies after 24 hours incubation was counted with a colony counter.

The results of the independent T-test showed a significant difference ($p < 0.05$) between the test groups or significant addition of arginine to the number of *S. mutans* bacteria. Based on the concluded results, the addition of 4% arginine to orthodontic RMGIC could inhibit the growth of *S. mutans* bacteria.

Keywords: resin modified glass ionomer cement, arginine, *Streptococcus mutans*