

Perbedaan efektivitas antibakteri gel chitosan dengan berat molekul berbeda terhadap jumlah koloni bakteri streptococcus mutans pada permukaan enamel sekitar braket ortodontik : studi In-Vitro =
Differences of antibacterial effectiveness of chitosan gel with different molecular weights against the number of streptococcus mutans colonies on enamel surface around orthodontic bracket : In-Vitro Study

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Abstrak

Latar belakang: Chitosan merupakan bahan alami yang bersifat antibakteri dan dapat dibentuk menjadi gel sehingga dapat dijadikan sebagai agen profilaksis khususnya anti-demineralisasi enamel di mana lesi white spot menjadi suatu risiko dari penggunaan alat ortodontik cekat. Berat molekul merupakan salah satu faktor yang dapat mempengaruhi efektivitas antibakteri chitosan, namun hubungan antara keduanya masih memberikan hasil yang inkonsisten.

Tujuan: Menganalisis perbedaan efektivitas antibakteri gel chitosan dengan berat molekul berbeda terhadap jumlah koloni bakteri Streptococcus mutans pada permukaan enamel sekitar braket ortodontik.

Metode: Dari 24 jumlah sampel, 6 sampel dioleskan gel chitosan A (50-80 kDa), 6 sampel dioleskan gel chitosan B (50-150 kDa), 6 sampel dioleskan gel chitosan C (190-310 kDa), dan 6 sampel dioleskan dengan gel kontrol klorheksidin diglukonat 0.2% (CHX). Seluruh sampel diinkubasi secara bertahap, 10 l suspensi plak yang terbentuk pada sampel dibiakkan untuk memperoleh jumlah koloni. Data dianalisis dengan uji one-way ANOVA dan uji lanjutan Least Significant Difference (LSD).

Hasil: Tidak terdapat perbedaan jumlah koloni bakteri Streptococcus mutans yang signifikan antara ketiga gel chitosan tersebut ($p>0.05$). Namun, terdapat perbedaan jumlah koloni bakteri Streptococcus mutans yang signifikan antara ketiga gel chitosan dengan gel kontrol ($p<0.05$).

Kesimpulan: Tidak terdapat perbedaan efektivitas antibakteri antara gel chitosan A, B, dan C secara statistik, meskipun terdapat perbedaan jumlah koloni bakteri secara klinis dan terdapat perbedaan efektivitas antibakteri antara gel klorheksidin diglukonat 0.2% (CHX) dengan ketiga gel chitosan tersebut.

.....Background: Chitosan is a natural antibacterial ingredient and can be formed into gel so that it can be used as a prophylactic agent, especially anti-enamel demineralization where white spot lesions are a risk of using fixed orthodontic appliances. Molecular weight is one of the factors that affects the antibacterial effectiveness of chitosan. The relationship between them still gives inconsistent results.

Aim: Analyzing differences in antibacterial effectiveness of chitosan gel with different molecular weights on the number of Streptococcus mutans colonies in the enamel surface around orthodontic brackets.

Methods: 24 total samples, 6 samples were smeared with chitosan gel A (50-80 kDa), 6 samples were

smearred with chitosan gel B (50-150 kDa), 6 samples were smearred with chitosan gel C (190-310 kDa), and 6 samples were smearred with chlorhexidine digluconate 0.2% gel (CHX) as control. All samples were incubated in stages, 10 l suspension of plaque formed on the samples were cultured to obtain the number of colonies. Data were analyzed by one-way ANOVA test and Least Significant Difference (LSD) test.

Result: There was no significant difference in the number of *Streptococcus mutans* colonies between the three chitosan gels ($p>0.05$) and there was a significant difference in the number of *Streptococcus mutans* colonies between the three chitosan gels and the control gel ($p<0.05$).

Conclusion: There was no difference in antibacterial effectiveness of chitosan gel A, B, and C, although there were differences in the number of bacterial colonies clinically and there were differences in the antibacterial effectiveness between 0.2% chlorhexidine digluconate gel (CHX) with those chitosan gels.