

INTISARI

Relapse ortodonti memiliki aktivitas seluler mirip pergerakan gigi ortodonti. Interleukin-1 β (IL-1 β) stimulasi ikatan RANKL-RANK yang mengaktifkan prekursor osteoklas untuk berdiferensiasi menjadi osteoklas dan menginduksi resorpsi tulang. *Silk sericin* mengandung antioksidan serin, threonin dan tyrosin sebagai penangkal radikal bebas dari proses inflamasi sehingga dapat menekan *nuclear factor kappa light chain enhancer of activated B cells* (NF- κ B) dan menurunkan IL-1 β . Kitosan potensial digunakan sebagai *drug delivery* dan memperkuat sifat *silk sericin* yang rapuh. Penelitian ini bertujuan untuk menganalisis pengaruh nanohidrogel *silk sericin*-kitosan terhadap kadar IL-1 β paska stabilisasi ortodonti in vivo. Tiga puluh tikus *R. norvegicus* terbagi menjadi 10 kelompok (n=3) terdiri dari 5 kelompok kontrol dan 5 kelompok perlakuan, masing-masing diamati hari ke 0, 3, 7, 14 dan 21. Gigi molar pertama kanan atas tikus digerakkan ke mesial menggunakan *close coil spring* selama 7 hari dilanjutkan stabilisasi 14 hari. Nanohidrogel *silk sericin*-kitosan dibuat dengan reksi gelasi ionik diaplikasikan secara intersulkuler di distal molar pertama, setiap hari selama 14 hari periode stabilisasi, dilanjutkan pelepasan peranti ortodonti. Cairan sulkus gingiva diambil pada hari ke-0, 3, 7, 14 dan 21 dibagian distal gigi molar kanan atas paska stabilisasi ortodonti. Kadar IL-1 β diukur dengan metode ELISA. Data yang diperoleh menunjukkan pengaruh penurunan yang signifikan pemberian nanohidrogel terhadap kadar IL-1 β kelompok perlakuan (p<0,05). Terdapat pengaruh yang signifikan terhadap hari pengamatan (p<0,05), namun tidak ada interaksi bermakna antara pemberian nanohidrogel dengan hari pengamatan (p>0,05). Kesimpulan penelitian ini adalah pemberian nanohidrogel *silk sericin*-kitosan dapat menurunkan IL-1 β paska stabilisasi ortodonti.

Kata kunci: *silk sericin*, kitosan, nanohidrogel, IL-1 β , *relapse*

ABSTRACT

Orthodontic relapse has cellular activity similar to orthodontic tooth movement. Interleukin-1 β (IL-1 β) stimulates RANKL-RANK binding that activates osteoclast precursors to differentiate into osteoclasts and induces bone resorption. Silk sericin contains the antioxidants serine, threonine and tyrosine as free radical scavengers from the inflammatory process to suppress the nuclear factor kappa light chain enhancer of activated B cells (NF- κ B) and reduce IL-1 β . Chitosan has the potential to be used as a drug delivery and strengthens the brittle of silk sericin. This study aims to analyze the effect of silk sericin-chitosan nanohydrogel on IL-1 β levels after orthodontic stabilization in vivo. Thirty R. norvegicus rats were divided into 10 groups (n=3) consisting of 5 control groups and 5 treatment groups, each observed on days 0, 3, 7, 14 and 21. The upper right first molar of the rats was moved mesially using a close coil spring for 7 days followed by 14 days of stabilization. Silk sericin-chitosan nanohydrogels made by ionic gelation reaction were applied intersulcularly in the distal part of the first molar, every day for 14 days of stabilization period, followed by removal of orthodontic appliances. Gingival crevicular fluid was taken on days 0, 3, 7, 14 and 21 in the distal part of the upper right molar after orthodontic stabilization. IL-1 β levels were measured by the ELISA method. The data showed significant decrease in treatment group nanohydrogel administration on IL-1 β levels ($p < 0.05$). There was a significant effect by the day of observation ($p < 0.05$), but there was no significant interaction between the administration of nanohydrogel and the day of observation ($p > 0.05$). The conclusion is that the administration of silk sericin-chitosan nanohydrogel can reduce IL-1 β after orthodontic stabilization.

Keywords: silk sericin, chitosan, nanohydrogel, IL-1 β , relapse