

## INTISARI

*Platelet rich fibrin* (PRF) dan *Advanced platelet rich fibrin* (a-PRF) merupakan turunan dari darah yang dapat digunakan untuk memengaruhi pergerakan gigi ortodonti, namun memerlukan penelitian lanjut mengenai efektivitas PRF dan a-PRF. Pergerakan gigi ortodonti terjadi karena peningkatan aktivitas aktif resorpsi tulang osteoklas. Kadar *C-terminal telopeptide of type I collagen* (CTX-1) merupakan salah satu marker untuk mengetahui aktivitas resorpsi tulang. Penelitian ini bertujuan mengetahui perbandingan injeksi PRF dengan a-PRF terhadap kadar CTX-1 pada pergerakan gigi ortodonti kelinci (*Oryctolagus cuniculus*).

Empat puluh lima kelinci dibagi menjadi 3 kelompok (n=15): kontrol, PRF, dan a-PRF. Peranti ortodonti *open coil spring* dipasang diantara braket insisivus rahang bawah dengan gaya sebesar 50 cN pasca anestesi ketamin dan *xylazin*. Cairan PRF dan a-PRF diinjeksikan 0.2 cc secara intrasulkular ke sulkus gingiva dan diulang setiap hari ke-7. Pengambilan sampel cairan sulkus gingiva diambil pada jam 08.00-10.00 WIB hari ke 0, 3, 7, 14, 21 dan dilakukan pengujian kadar CTX-1 dengan metode ELISA menggunakan ELISA Kit CTX-1 (BT LAB, England). Data yang diperoleh dianalisis menggunakan *Two-way ANOVA* dan uji *Tukey's post-hoc HSD* ( $p < 0,05$ ).

Hasil penelitian menunjukkan kadar CTX-1 meningkat secara signifikan pada hari ke-7, hari ke-14 ( $p < 0,05$ ) pasca aktivasi peranti ortodonti. Peningkatan kadar CTX-1 tertinggi terjadi pada kelompok a-PRF, diikuti kelompok PRF, dan paling rendah kelompok kontrol. Kesimpulan penelitian ini adalah injeksi intrasulkular a-PRF dapat meningkatkan kadar CTX-1 lebih tinggi dibandingkan injeksi PRF.

Kata kunci: *advanced-platelet-rich fibrin*, *C-terminal telopeptide of type I collagen*, *platelet-rich fibrin*, pergerakan gigi ortodonti

## ABSTRACT

Platelet rich fibrin (PRF) and Advanced platelet rich fibrin (a-PRF) are blood derivatives that can be used to influence orthodontic tooth movement, but require further research regarding the effectiveness of PRF and a-PRF. Orthodontic tooth movement occurs due to an increase in the active activity of osteoclast bone resorption. C-terminal telopeptide of type 1 collagen (CTX-1) levels are a marker for determining bone resorption activity. This study aims to determine the comparison of PRF injection with a-PRF on CTX-1 levels in orthodontic tooth movement rabbit (*Oryctolagus cuniculus*).

Forty-five rabbits were divided into 3 groups (n=15): control, PRF, and a-PRF. An open coil spring orthodontic appliance was placement between the mandibular incisor brackets with a force of 50 cN after ketamine and xylazine anesthesia. Platelet rich fibrin and a-PRF fluids were injected 0.2 cc intrasulcularly into the gingival sulcus and repeated every 7th day. Gingival crevicular fluid samples were taken at 08.00-10.00 WIB on days 0, 3, 7, 14, 21 and tested for CTX-1 levels using the ELISA method using the CTX-1 ELISA Kit (BT LAB, England). The data obtained were analyzed using *Two-way ANOVA* and *Tukey's post-hoc HSD test* ( $p < 0.05$ ).

The results showed that CTX-1 levels increased significantly on day 7, day 14 ( $p < 0.05$ ) after activation of the orthodontic device. The highest increase I CTX-1 levels occurred in the a-PRF group, followed by the PRF group, and the lowest in the control group. The conclusion of this study is that intrasulcular injection of a-PRF can increase CTX-1 levels higher than PRF injection

Key words: advanced-platelet-rich fibrin, C-terminal telopeptide of type 1 collagen, platelet-rich fibrin, orthodontic tooth movement