

INTISARI

Tatalaksana maloklusi dapat dicapai dengan perawatan ortodonti, namun durasi perawatan ortodonti yang lama dapat menyebabkan efek samping seperti karies dan buruknya kebersihan mulut sehingga diupayakan berbagai penelitian untuk mempercepat laju pergerakan gigi ortodonti. Salah satu biomarker pergerakan gigi ortodonti adalah kadar *Receptor Activator of Nuclear Kappa-β Ligand* (RANKL) yang dihasilkan osteoblas untuk mengaktivasi osteoklas saat proses remodeling tulang. Penelitian ini bertujuan untuk menganalisis pengaruh injeksi intrasulkular PRF dan a-PRF terhadap kadar RANKL pada pergerakan gigi ortodonti kelinci.

Empat puluh lima kelinci dibagi menjadi 3 kelompok, kontrol, PRF, dan a-PRF. Peranti ortodonti *open coil spring* dipasang diantara braket insisivus rahang bawah dengan gaya sebesar 50 *gram force*. Cairan PRF dan a-PRF diinjeksikan secara intrasulkular ke sulkus gingiva paska aktivasi peranti ortodonti, kemudian diulang pada hari ke 7 dan 14 paska pengambilan sampel cairan sulkus gingiva. Pengambilan sampel cairan sulkus gingiva diambil di sisi tertekan pada hari ke 0, 3, 7, 14 dan 21., selanjutnya dilakukan pengujian kadar RANKL dengan metode ELISA menggunakan ELISA Kit Rabbit RANKL (BT LAB, *England*). Data dianalisis dengan menggunakan Anava dua jalur dan *Post Hoc* HSD.

Hasil penelitian menunjukkan kadar RANKL meningkat secara signifikan ($p < 0,05$) pada hari ke-7, 14 dan 21 paska aktivasi peranti ortodonti. Peningkatan kadar RANKL tertinggi terjadi pada kelompok a-PRF, diikuti kelompok PRF, dan paling rendah yaitu kelompok kontrol. Injeksi intrasulkular a-PRF dapat meningkatkan kadar RANKL lebih tinggi dibandingkan injeksi PRF.

Kata Kunci : *advanced-platelet-rich fibrin, platelet-rich fibrin, RANKL*

ABSTRACT

Long duration of orthodontic treatment to treat malocclusion can cause side effects such as caries and poor oral hygiene. Various studies have been attempted to speed up the rate of orthodontic tooth movement. One of the biomarkers of orthodontic tooth movement is the level of Receptor Activator of Nuclear Kappa- β Ligand (RANKL) which is produced by osteoblasts to activate osteoclasts during the bone remodelling process. This study aims to analyze the effect of intrasulcular injection of PRF and a-PRF on RANKL levels in rabbit orthodontic tooth movement.

Forty-five rabbits were divided into 3 groups: control, PRF, and a-PRF. The open coil spring appliance was applied between the mandibular incisor brackets with 50 gram force. PRF and A-PRF were injected intrasulcularly into the gingival sulcus after placement of orthodontic appliance and were repeated on day 7 and 14 after gingival crevicular fluid sample collection. Gingival crevicular fluid samples from pressure side were taken on days 0, 3, 7, 14, and 21. RANKL levels were tested using the ELISA method using the ELISA Kit Rabbit RANKL (BT LAB, England). Data were analyzed by two way Anova and Post Hoc HSD test.

The results showed that RANKL levels increased significantly ($p < 0.05$) on days 7, 14 and 21 after activation of the orthodontic device. The highest increase in RANKL levels occurred in the a-PRF group, followed by the PRF group, and the lowest was in the control group. Intrasulcular injection of a-PRF can increase RANKL levels higher than PRF injection.

Keywords : advanced-platelet-rich fibrin, fixed orthodontic treatment, platelet-rich fibrin, RANKL