INTISARI

Gigi yang mengalami penurunan tekanan oklusal atau gigi hipofungsional ketika digerakkan secara ortodonti mengalami penurunan laju pergerakan ortodonti dibandingkan dengan gigi normal. Osteoprotegerin (OPG) disekresikan oleh osteoblas dan menghambat osteoklastogenesis dengan mencegah interaksi *receptor activator of nuclear factor kappa-B ligand* (RANKL) dengan *receptor activator of nuclear factor kappa-B* (RANK). Tujuan dari penelitian ini adalah untuk mengetahui kadar osteoprotegerin sisi tertarik tulang alveolar pada gigi hipofungsional selama pergerakan gigi ortodonti.

Penelitian menggunakan 18 tikus *Wistar* jantan yang diberi aplikasi *labial coil spring* pada gigi insisivus rahang atas. Tikus dibagi menjadi 2 kelompok, yaitu kelompok ortodonti dengan daya kunyah normal (NO) dan tanpa daya kunyah (hipofungsional, HO). Sampel cairan sulkus gingiva diambil pada hari ke 0 (H_0), 5 (H_5), dan 10 (H_{10}). Kadar OPG dalam sampel dianalisis menggunakan *Enzyme-Linked Immunosorbent Assay* (ELISA). Data kadar OPG pada sisi tertarik kemudian dilakukan uji analisis secara statistik menggunakan uji Anava Dua Jalur dan dilanjukan uji Post Hoc LSD.

Hasil penelitian menunjukkan kadar osteoprotegerin pada sisi tertarik kelompok HO lebih tinggi daripada kelompok NO ($p<0,05$). Kadar osteoprotegerin sisi tertarik kelompok HO, pada H_5 sama dengan H_{10} ($p>0.05$). Kadar osteoprotegerin sisi tertarik kelompok HO pada H_5 sama dengan kelompok NO pada H_{10} ($p>0.05$). Hasil penelitian dapat disimpulkan bahwa kadar OPG sisi tertarik tulang alveolar pada gigi hipofungsional lebih tinggi dibanding gigi normal selama pergerakan gigi secara ortodonti, terjadi peningkatan kadar OPG sisi tertarik tulang alveolar pada gigi hipofungsional selama 5 dan 10 hari pergerakan gigi secara ortodonti, peningkatan kadar OPG pada hari ke-5 gigi hipofungsional sama dengan hari ke-10 gigi daya kunyah normal, terdapat interaksi antara gigi hipofungsional dan waktu pengamatan terhadap kadar OPG cairan sulkus gingiva sisi tertarik selama pergerakan gigi secara ortodonti.

Kata kunci : hipofungsional, pergerakan gigi secara ortodonti, osteoprotegerin

ABSTRACT

Hypofunctional teeth when moved orthodontically will have a decreased tooth movement rate compared to normal teeth. Osteoprotegerin (OPG) is secreted by osteoblastic cells and inhibits osteoclastogenesis by preventing the interaction of receptor activator of nuclear factor kappa-B ligand (RANKL) with receptor activator of nuclear factor kappa-B (RANK). The aim of this study was to determine the level of OPG on the tension side of the hypofunctional teeth during orthodontic tooth movement.

Eighteen Male Wistar rats were given a labial coil spring application on the maxillary incisors. Rats were divided into 2 groups, the orthodontic group with normal occlusion (NO) and hypofunctional (HO). The gingival crevicular fluid were obtained using a paper point to evaluate OPG levels on days 0 (H_0), 5 (H_5), and 10 (H_{10}). OPG levels in samples were analysed using the Enzyme-Linked Immunosorbent Assay (ELISA). The data were analysed using the Analysis of Variance (ANOVA) and continued with the Post Hoc Least Significance Difference (LSD).

The results showed that the levels of OPG in group HO was significantly higher than group NO ($p<0.05$). The levels of OPG in group HO at H_5 not only was the same as H_{10} in group HO ($p>0.05$) but also the levels of OPG in group NO at H_{10} ($p>0.05$). From this study, it can be concluded that OPG levels on the alveolar bone on the tension side in hypofunctional teeth were higher than normal teeth during orthodontic tooth movement, and there was an increase in OPG levels on the alveolar bone on the tension side in hypofunctional teeth during 5 and 10 days of orthodontic tooth movement, increased OPG levels on the 5th day the hypofunctional teeth are the same as the 10th day of the normal occlusion, there is an interaction between the hypofunctional teeth and the time of observation of OPG levels of the gingival sulcus fluid on the tension side during orthodontic tooth movement.

Keyword : hypofunction, orthodontic tooth movement, osteoprotegerin