

INTISARI

Stimulasi pembentukan tulang merupakan upaya pencegahan relaps pasca perawatan kawat gigi. Enzim alkaline fosfatase (ALP) sebagai marker awal pembentukan tulang diketahui menurun pada usia tua yang berkaitan dengan meningkatnya *oxidative stress*. Flavonoid banyak diteliti berperan sebagai antioksidan yang mampu menangkal radikal bebas dan menurunkan *oxidative stress*. Flavonoid terkandung dalam berbagai jenis makanan, salah satunya madu. Flavonoid dalam madu dapat menstimulasi proses pembentukan tulang melalui stimulasi proliferasi dan diferensiasi osteoblas. Penelitian ini bertujuan untuk mempelajari pengaruh pemberian madu terhadap kadar ALP cairan sulkus gingiva tikus tua dan muda pada relaps pasca stabilisasi ortodonti.

Sprague dawley tua dan muda dibagi menjadi dua kelompok (kontrol dan perlakuan). Gaya ortodonti diaplikasikan pada interinsisivus rahang atas menggunakan *open coil spring* selama 14 hari. Madu dosis 0,40 ml/200gram BB diberikan selama 14 hari fase stabilisasi pada kelompok perlakuan. Analisis kadar ALP cairan sulkus gingiva hari ke-0,3,7,14 fase relaps pasca stabilisasi menggunakan *microplate reader* panjang gelombang 450 nm. Analisis statistik menggunakan uji Anava tiga jalur dan uji *Post Hoc* LSD $p < 0,05$.

Hasil penelitian menunjukkan terdapat perbedaan kadar ALP cairan sulkus gingiva antara kelompok kontrol dan perlakuan ($p < 0,05$). Peningkatan kadar ALP pada kelompok tikus muda lebih tinggi dibanding kelompok tikus tua. Kadar ALP tertinggi terlihat pada kelompok tikus muda yang diberi madu pada hari ke-14. Kesimpulan penelitian ini adalah pemberian madu selama fase stabilisasi dapat meningkatkan pembentukan tulang alveolar pada fase relaps melalui peningkatan kadar ALP cairan sulkus gingiva.

Kata kunci: alkaline fosfatase, madu, relaps, ortodonti, tua dan muda

ABSTRACT

Stimulation of bone formation is a mechanism to prevent orthodontic relapse. Alkaline phosphatase (ALP) is an early marker of osteoblastogenesis and it promotes bone formation. ALP decreased in aging due to rises in oxidative stress. Flavonoid has an antioxidant effect as radical scavenging ability to decrease oxidative stress. Flavonoid contains in honey stimulates bone formation by induction of osteoblast differentiation and mineralization. This study aimed to investigate the effect of honey administration on ALP levels in gingival crevicular fluid in young and old rats in relapse after orthodontic stabilization.

Young and adult *Sprague dawley* were divided into two groups (control groups and experimental groups). The orthodontic force was applied using open coils spring in the maxillary incisor of rats for 14 days of activation. The experimental group was given 0,40 ml/200gram BW of honey during 14 days stabilization periods. The gingival crevicular fluid was collected using paper points on relapse days 0, 3, 7, 14 and evaluated for the expression levels of ALP using a microplate reader 450 nm wavelength. Statistical analysis was performed using three ways ANOVA and Post Hoc LSD $p < 0,05$.

The results of this study showed the ALP levels in the treatment groups were significantly different from the control group ($p < 0.05$). The young groups have higher ALP levels than the old groups. The highest ALP levels were observed on day 14 relapse after stabilization. It can be concluded that honey administration during the stabilization periods increased alveolar bone formation in the relapse period by increasing ALP level.

Keywords: alkaline phosphatase, honey, relapse, orthodontic, young and adult