

## INTISARI

Pergerakan gigi secara ortodonti terjadi karena proses remodeling tulang yang melibatkan proses resorpsi tulang oleh osteoklas di daerah tertekan, serta pembentukan tulang oleh osteoblas di daerah tertarik. Remodeling tulang dipengaruhi beberapa faktor, salah satunya kondisi hormonal seperti hormon estrogen. Gandum adalah bahan pokok yang sering dikonsumsi dan mengandung fitoestrogen. Fitoestrogen merupakan tanaman yang memiliki struktur, fungsi yang mirip seperti hormon estrogen. Penelitian ini bertujuan mengetahui pengaruh pemberian biji gandum terhadap imbalanced jumlah osteoblas di daerah tertarik dan osteoklas di daerah tertekan pada pergerakan gigi secara ortodonti.

Penelitian ini merupakan eksperimental laboratoris. Menggunakan hewan coba 36 ekor tikus *Sprague dawley* jantan, dibagi menjadi kelompok perlakuan muda, perlakuan tua, kontrol muda dan kontrol tua. Gigi incisivus rahang atas tikus digerakkan ke distal menggunakan alat ortodonti berupa kawat *stainless steel* 0,012 U dengan koil diameter 2 mm dan panjang lengan kawat 5 mm pada keempat kelompok. Hewan coba kelompok perlakuan diberi ekstrak biji gandum dosis 0,3 g untuk tikus muda dan 0,6 g untuk tikus tua. Tikus dimatikan pada hari ke-1,4,7 setelah pemasangan ortodonti. spesimen dilakukan pengecatan Hematoksilin eosin dan dianalisis menggunakan mikroskop optilab. Data dianalisis menggunakan uji *three-way anova* dengan tingkat kepercayaan 95%.

Hasil uji *three-way anova* menunjukkan perbedaan signifikan antara kelompok kontrol, perlakuan, usia, waktu pengamatan terhadap imbalanced jumlah osteoblas di daerah tertarik dan osteoklas di daerah tertekan ( $p < 0,05$ ). Hasil menunjukkan peningkatan imbalanced kelompok perlakuan, peningkatan imbalanced usia muda lebih tinggi dibandingkan usia tua serta peningkatan imbalanced hari pengamatan ke 7, 4, 1 usia muda dan hari 7, 4, 1 usia tua.

Kata kunci : Gandum, fitoestrogen, pergerakan gigi secara ortodonti, imbalanced osteoblas-osteoklas, usia, hari pengamatan

## Abstract

Orthodontic tooth movement occurs due to bone remodelling that involves bone resorption process by osteoclast cells in the pressure side and bone development by osteoblast cells in the tension side. Bone remodelling is affected by many factors, including hormonal condition as estrogen hormone. Wheat is one of staple crops it contains phytoestrogens and has structures and activities similar to estrogen hormone. This study is aimed to determine the effect of wheat seed on the balanced number of osteoblast in the tension side on orthodontic tooth movement.

This study is laboratory experimental study which used 36 male *Sprague dawley* rats as the experimental animal. Animals were divided into groups such as young treatment, old treatment, young control, and old control group. The maxillary incisivus was moved distally with a 0.012 U stainless steel orthodontic appliances with a 2 mm diameter coil and 5 mm wire length in all groups. Treatment groups were given wheat extract with a dose of 0.3 g for the young group and 0.6 g for the old group. The animals were killed on the 1st, 4th, and 7th day after the orthodontic appliance installation. The specimen results were stained using Hematoxylin-Eosin and observed using a microscope optilab. Data were analyzed using three-way Anova with a confidence level of 95%.

The results of three-way Anova Test showed significant differences between control and treatment group, age, and observation time and the balanced number of osteoblast in tension side and osteoclast in pressure side ( $p < 0.05$ ). The results showed an increase in the balanced number of treatment group, young and old group, and 1st, 4th, and 7th day group.

**Keywords :** Wheat, phytoestrogens, Orthodontic Tooth Movement, Osteoblast-Osteoclast Balance, age, observation time.