ABSTRAK

Proses ortodonsi resorpsi dan remodeling tulang akan terjadi bersamaan. Pada daerah yang tertekan terus menerus akan mengalami kekurangan nutrisi dan hipoksia yang mengakibatkan kematian sel sehingga lama kelamaan akan mengalami resorpsi tulang alveolar. Peningkatan ekspresi RANKL berhubungan dalam proses inflamasi karena disertai peningkatan mediator inflamasi. Kombinasi SHED (*Stem Cell Human Exfoliated Decidious Teeth*) dan PRP (*Platetel Rich Plasma*) dapat menginduksi regenerasi tulang alveolar gigi dan dapat menghambat proses resorpsi tulang sehingga menekan proses inflamasi. Penelitian ini bertujuan untuk mengetahui pengaruh kombinasi SHED dan PRP terhadap ekspresi RANKL pada tulang alveolar tikus wistar jantan.

Metode penelitian ini berjenis eksperimental *post-test only control group design*, dengan total sampel berjumlah 32 ekor dengan perlakuan gel PRP, gel SHED, kombinasi PRP dan SHED, dan povidone iodine. induksi periodontitis dengan forcep. aplikasi wedge pada interdental gigi untuk menghasilkan efek pergerakan orto. Setelah 14 hari perlakuan, diperiksa immunohistokimia untuk mengetahui ekspresi RANKL. Analisis data menggunakan analisis *one way anova*.

Hasil penelitian menunjukkan rerata ekspresi RANKL kelompok PRP sebesar 9,625±0,72, SHED 9,825±0,92, kombinasi PRP dan SHED 7,760±1,39, povidone iodine 10,725±0,46. Analisis uji hipotesis *one way anova* didapatkan bahwa terdapat perbedaan yang signifikan ekspresi RANKL masing-masing kelompok percobaan (P<0.05).

Kesimpulan yang diperoleh yaitu terdapat pengaruh kombinasi SHED dan PRP terhadap penurunan ekspresi RANKL pada tulang alveolar tikus wistar jantan.

Kata kunci : Orthodonsi, *Receptor Activator of Nuclear Factor kappa-B Ligand* (RANKL), *Stem Cell Human Exfoliated Decidious Teeth* (SHED), *Platetel Rich Plasma* (PRP)
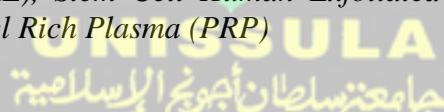
ABSTRACT

The process of orthodontics bone resorption and remodeling occur simultaneously. In areas that are under continuous stress, they will experience nutritional deficiencies and hypoxia which results in cell death so that over time it will experience alveolar bone resorption. Increased expression of RANKL is associated with the inflammatory process because it is accompanied by an increase in inflammatory mediators. The combination of SHED (Stem Cell Human Exfoliated Decidious Teeth) and PRP (Platetel Rich Plasma) can induce alveolar bone regeneration and can inhibit the bone resorption process thereby suppressing the inflammatory process. This study aims to determine the effect of the combination of SHED and PRP on RANKL expression in the alveolar bone of male Wistar rats.

This research method was experimental post-test only control group design, total sample of 32 male Wistar rats treated with PRP gel, SHED gel, a combination of PRP and SHED, and povidone iodine. Induction of periodontitis with forceps, wedge application to the interdental to produce the effect of ortho movement. After 14 days of treatment immunohistochemistry was examined to determine RANKL exsspression, Data analysis used one way anova analysis.

The results showed that the mean RANKL expression in the PRP group was 9,625 ± 0,72, SHED 9,825 ± 0,92, the combination of PRP and SHED was 7,760 ± 1,39, povidone iodine 10,725 ± 0,46. Analysis of the one way anova hypothesis test found that there was significant difference in the RANKL expression for each experimental group ($P < 0.05$).

It can be concluded that there was effect of the combination of SHED and PRP on decreasing RANKL expression in the alveolar bone of male Wistar rats.

Keywords: Orthodontics, Receptor Activator of Nuclea Factor kappa-B Ligand (RANKL), Stem Cell Human Exfoliated Decidious Teeth (SHED), Platetel Rich Plasma (PRP)