

INTISARI

Alat ortodonti dapat mengganggu mekanisme pembersihan rongga mulut, sehingga dapat menyebabkan terjadinya gingivitis. Gingivitis yang tidak dirawat dapat berkembang menjadi penyakit periodontal yang lebih parah. Medikasi alternatif untuk gingivitis diperlukan karena klorheksidin sebagai baku emas perawatan gingivitis telah menunjukkan berbagai efek negatif. Papain terbukti memiliki efek antibakteri dan antiinflamasi, sedangkan arginin dapat mempercepat proses penyembuhan luka, menghambat pembentukan biofilm dan mengganggu kestabilan plak. Penelitian ini bertujuan untuk mengetahui pengaruh aplikasi gel papain–arginin terhadap proliferasi neutrofil pada terapi gingivitis dalam perawatan ortodonti.

Gel papain–arginin dibuat dengan mencampurkan papain 10% b/b, arginin 8% b/b dan CMC–Na 2%. Tikus *Sprague dawley* jantan sejumlah 27 ekor dengan berat ± 250 –300 gram dibagi secara acak menjadi 3 kelompok; gel papain–arginin, gel klorheksidin dan tanpa perlakuan. Tikus diinduksi gingivitis selama 7 hari dengan alat ortodonti *3–spin loop spring* yang dipasangkan pada kedua gigi insisivus rahang atas tikus. Spesimen gingiva dari tiap kelompok dibuat preparat histologis dengan pengecatan hematoksilin–eosin pada hari ke–1, 3 dan 7 setelah perawatan. Pengamatan proliferasi neutrofil menggunakan mikroskop binokuler dan kamera *Optilab Advance* dengan perbesaran 400 kali.

Hasil uji *two–way ANOVA* menunjukkan adanya perbedaan yang signifikan ($P < 0,05$) antar kelompok, waktu pengamatan serta interaksi antara kelompok dan waktu pengamatan terhadap jumlah proliferasi neutrofil. Uji *post hoc LSD* menunjukkan gel papain–arginin dan gel klorheksidin memiliki kemampuan yang sama dalam menurunkan jumlah proliferasi neutrofil. Kesimpulan penelitian ini yaitu aplikasi gel papain–arginin dapat mempercepat penurunan jumlah proliferasi neutrofil pada terapi gingivitis dalam perawatan ortodonti.

Kata kunci: arginin, gingivitis, neutrofil, ortodonti, papain

ABSTRACT

Orthodontic appliances might interfere oral cleansing mechanism which lead to gingivitis forming. Untreated gingivitis will progress into further periodontal diseases. Chlorhexidine as a gold standard of gingivitis treatment had shown a wide range of negative effect. Therefore, an alternative of gingivitis treatment medication is required. Papain enzyme has been employed for its antibacterial and anti inflammation effects. Meanwhile, arginine is able to enhance wound healing, inhibit biofilm formation and interfering plaque stability. The aim of this study was to evaluate the effect of papain–arginine gel application on the number of neutrophils proliferation on the treatment of gingivitis caused by orthodontic appliances.

Papain–arginine gel was prepared by mixing 10% w/w papain, 8% w/w arginine and 2% CMC–Na. A total of 27 male *Sprague dawley* rats weighing ± 250 –300 grams were randomly divided into three groups; papain–arginine gel group, chlorhexidine gel group and untreated group. Rats were induced gingivitis for 7 days by placing 3–spin loop spring orthodontic appliance in the upper incisors. Gingiva specimens from all groups were prepared for histological processing followed by hematoxylin–eosin staining at day 1, 3 and 7 days after treatment. Neutrophils proliferation were observed under binocular microscope with *Optilab Advance* camera at 400 times magnification.

Two–way ANOVA showed a significant difference ($P < 0.05$) of neutrophil proliferation between groups, days and interaction between groups and days. Post hoc LSD indicates that papain–arginine gel and chlorhexidine gel has the same capability to reduce neutrophil proliferation. It can be concluded that papain–arginine gel was able to accelerate the decline of neutrophils proliferation on the treatment of gingivitis caused by orthodontic appliances.

Keywords: arginine, gingivitis, neutrophil, orthodontic, papain