

## INTISARI

**Latar belakang.** Asam hialuronat (AH) dan *platelet-rich fibrin* (PRF) terbukti mampu meregenerasi papila interdental. Membran *Leucocyte PRF* (L-PRF) diaplikasikan secara bedah namun hasil samping pembuatan membran L-PRF yaitu eksudat L-PRF, *Concentrated PRF* (C-PRF) maupun kombinasi eksudat L-PRF dan C-PRF belum dimanfaatkan untuk regenerasi papila interdental. Penelitian ini bertujuan untuk membandingkan regenerasi papila interdental pascainjeksi eksudat L-PRF, C-PRF, kombinasi eksudat L-PRF dan C-PRF, dengan AH. **Metode penelitian.** *Platelet-rich fibrin* berasal dari 10 ml darah manusia yang disentrifugasi dengan mesin *fixed angle* kecepatan 2700 selama 12 menit. Lapisan PRF dipisahkan, dilanjutkan hitung jumlah trombosit dan leukosit. Dua puluh  $\mu$ L eksudat L-PRF (n=3), C-PRF (n=3), kombinasi eksudat L-PRF dan C-PRF (n=3), AH (n=3), dan *phosphate-buffered saline* (PBS) (n=3) diinjeksikan pada papila interdental *Sprague-Dawley* model *open gingival embrasure* (OGE). Lebar OGE, *spring-papilla distance* (SPD), fibroblas, kolagen, pembuluh darah, epitel, dan *proliferating cell nuclear antigen* (PCNA) diamati secara *double blinded* oleh 2 *independent observer* dengan indeks reliabilitas >80%. Lebar OGE dan SPD pada hari ke-14 tidak terdistribusi normal sehingga dilakukan uji Kruskal-Wallis. Parameter lain terdistribusi normal dan dianalisis dengan analisis varians (ANOVA) satu arah diikuti oleh Tukey's HSD. **Hasil penelitian.** Semua jenis PRF memiliki jumlah fibroblas yang lebih tinggi daripada AH ( $p < 0,05$ ) namun hanya C-PRF yang memiliki jumlah pembuluh darah lebih tinggi dibandingkan AH ( $p < 0,05$ ). Semua kelompok PRF memiliki kepadatan kolagen, ketebalan epitel, ekspresi PCNA, dan tinggi papila interdental yang sama dengan AH ( $p > 0,05$ ). **Kesimpulan.** Injeksi hasil samping pembuatan membran L-PRF meningkatkan proliferasi fibroblas dan ekspresi PCNA pada lapisan superfisial epitel lebih tinggi dibandingkan AH. Hanya *Concentrated PRF* yang menstimulasi vaskularisasi dan memiliki retepeg lebih tinggi dibandingkan AH. Kepadatan kolagen, ketebalan epitel, ekspresi total PCNA pada epitel, dan tinggi papila interdental pascainjeksi PRF sama dengan AH. Injeksi L-PRF, C-PRF, kombinasi L-PRF dan C-PRF berpotensi sebagai alternatif AH pada perawatan rekonstruksi papila interdental secara non bedah.

**Kata kunci:** asam hialuronat, gingiva, *platelet-rich fibrin*, *proliferating cell nuclear antigen*, regenerasi

## ABSTRACT

**Introduction.** Hyaluronic acid (HA) and platelet-rich fibrin (PRF) regenerate interdental papillae. While leucocyte-rich PRF (L-PRF) is applied surgically, other by-products like L-PRF exudate and concentrated PRF (C-PRF) have not been thoroughly studied. This study compares the regeneration effects of L-PRF exudate, C-PRF, their combination, and HA. **Method.** PRF was obtained by centrifuging 10 ml of human blood at 2700 RPM for 12 minutes, and 20  $\mu$ L samples were injected into the interdental papillae of an open gingival embrasure (OGE) model in Sprague-Dawley rats. The groups included L-PRF exudate (n=3), C-PRF (n=3), combined L-PRF exudate and C-PRF (n=3), autologous hemostatic agent (HA) (n=3), and phosphate-buffered saline (PBS) (n=3). OGE width, spring-papilla distance (SPD), fibroblast counts, collagen density, blood vessels, epithelium, and PCNA expression were assessed by two independent observers with a reliability index of >80%. The OGE width and SPD on day 14 were analyzed using the Kruskal-Wallis's test, while other parameters were assessed with one-way ANOVA and Tukey's HSD test (p-value<0.05). **Result.** All PRF had a higher number of fibroblasts than HA (p<0.05), but only C-PRF had a higher number of blood vessels than HA (p<0.05). As HA, all PRF groups had the same collagen density, epithelial thickness, PCNA expression, and interdental papillae height (p>0.05). **Conclusion.** The injection of L-PRF membrane byproduct increased fibroblast proliferation and PCNA expression in the superficial layer of the epithelium, which was higher than AH. Only Concentrated PRF stimulated vascularization and had a higher retepeg than AH. Collagen density, epithelial thickness, total PCNA expression in the epithelium, and height of interdental papillae after PRF injection were similar to AH. Injection of L-PRF, C-PRF, and a combination of L-PRF and C-PRF can be an alternative to AH in the non-surgical reconstructive treatment of interdental papillae. Injection of L-PRF, C-PRF, and a combination of L-PRF and C-PRF can be an alternative to HA in treating the non-surgical reconstruction of interdental papillae.

**Keywords:** gingiva, hyaluronic acid, platelet-rich fibrin, proliferating cell nuclear antigen, regeneration