

## INTISARI

Efek diabetes melitus terhadap gangguan penyembuhan luka terjadi akibat hiperglikemia. Kondisi ini dapat menyebabkan abnormalitas sel endotel baik fungsi maupun morfologinya, sehingga mengganggu proses angiogenesis. Penelitian ini bertujuan menguji pengaruh laktoferin terhadap angiogenesis melalui pengamatan kepadatan mikrovessel (MVD) dan rasio luas mikrovessel (MVAR) pada tikus diabetes.

Dua puluh tujuh ekor tikus Sprague Dawley diabetes melitus tipe 2 yang diinduksi STZ dibagi 3 kelompok dan dibuat luka di punggung dengan *punch biopsy*. Kelompok I diberi gel povidon iodine 10% secara topikal, kelompok II diberi gel CMC-Na secara topikal dan kelompok III diberi gel laktoferin 1,5 µg/ml secara topikal. MVD dan MVAR diperiksa secara histologis pada hari ke-7 dengan pewarnaan imunohistokimia anti VEGF dengan penghitungan morfometri menggunakan *software script* MAT LAB.

Hasil uji statistik Manova menunjukkan ada perbedaan angiogenesis antara ketiga kelompok ( $P < 0,05$ ). Uji post hoc menunjukkan bahwa ada perbedaan MVD dan MVAR yang bermakna antara kelompok yang diberi laktoferin 1,5 µg/ml dengan kelompok yang diberi PVI 10% dan gel CMA-Na ( $p < 0,05$ ) dan tidak ada perbedaan MVD dan MVAR yang bermakna antara kelompok PVI dan CMC-Na ( $p > 0,05$ ). Kesimpulan penelitian ini adalah pemberian gel laktoferin 1,5 µg/ml paling efektif dalam mempercepat penyembuhan luka dengan meningkatkan angiogenesis pada luka tikus model DM tipe 2 dari pada pemberian PVI 10% dan gel CMC-Na ( $p < 0,05$ ).

**Kata Kunci:** Penyembuhan luka, diabetes melitus tipe 2, laktoferin, angiogenesis, MVD, MVAR

## ABSTRACT

*Diabetes mellitus contributes to the disorder in wound healing because of hyperglycemia. This condition can stimulate endothelial cell abnormalities in both function and morphology, thus interfering with the angiogenesis process. This study aimed to examine the effects of lactoferrin on angiogenesis through observation of the microvessel density (MVD) and the microvessel area ratio (MVAR) on diabetic rat.*

*Twenty seven STZ-induced Sprague Dawley rats of type 2 diabetes mellitus were divided into 3 groups and received punch biopsy on the back. Group I was topically applied with 10% povidone iodine gel, Group II was topically treated with CMC-Na gel and Group III was given a topical 1.5 µg / ml lactoferrin gel. MVD and MVAR were examined histologically on day 7 with anti-VEGF immunohistochemical staining with MAT LAB script software-assisted morphometric calculation.*

*Multivariate analysis of variance (MANOVA) statistics test showed that there were differences in angiogenesis among the three groups ( $P < 0.05$ ). Post-hoc test indicated there were significant differences in MVD and MVAR between the group applied with 1.5 µg / ml lactoferrin and the group treated with 10% PVI and CMA-Na gel ( $p < 0.05$ ) and no significant differences in MVD and MVAR were found between the PVI and CMC-Na groups ( $p > 0.05$ ). This study concluded that 1.5 µg / ml lactoferin gel was the most effective application in accelerating wound healing by increasing angiogenesis in type 2 diabetes mellitus compared to the application of 10% PVI and CMC-Na ( $p < 0.05$ ).*

**Keywords:** Wound healing, type 2 diabetes mellitus, lactoferrin, angiogenesis, MVD, MVAR