

ABSTRAK

Nama. : Nindya Faza Fadhila

Program Studi : Kedokteran

Judul Skripsi : Studi Eksperimental Efek Formulasi Getah *Jatropha multifida* L-Plasenta-CMC terhadap Angiogenesis pada Proses Penyembuhan Luka Sayat Tikus Putih Jantan dan Tinjauannya Menurut Pandangan Islam

Latar Belakang : Luka sayat merupakan luka terbuka akibat benda tajam yang berisiko menimbulkan perdarahan dan infeksi. Penyembuhan luka melibatkan tahapan inflamasi, proliferasi, dan remodeling jaringan. *Povidone iodine* efektif sebagai antiseptik, namun berpotensi menimbulkan iritasi dan keterbatasan efektivitas jangka panjang. Oleh karena itu, diperlukan alternatif terapi aman berbasis bahan alam. Getah *Jatropha multifida* L. bersifat antimikroba, antiinflamasi, dan pro-angiogenik, plasenta kaya faktor pertumbuhan, dan *Carboxymethyl Chitosan* (CMC) berperan sebagai matriks biokompatibel. Kombinasi ketiganya diharapkan mampu meningkatkan proses penyembuhan luka melalui stimulasi angiogenesis dan regenerasi jaringan. Penelitian ini bertujuan mengevaluasi pengaruh formulasi getah *J. multifida* L-plasenta-CMC terhadap angiogenesis dan gambaran makroskopik penyembuhan luka sayat pada tikus putih jantan.

Metodologi : Penelitian ini merupakan penelitian eksperimental murni dengan pendekatan kuantitatif. Hewan uji dibagi menjadi tujuh kelompok: *saline*, *base cream*, *Povidone iodine*, *Jatropha multifida* L., plasenta, CMC, dan kombinasi JM-P-CMC. Evaluasi makroskopis dilakukan setiap hari dengan dokumentasi foto pada hari ke-5, hari ke-10, dan hari ke-15. Analisis mikroskopis angiogenesis dilakukan setelah terminasi hewan menggunakan pewarnaan HE dengan penghitungan jumlah pembuluh darah pada tiga lapang pandang acak. Efektivitas perlakuan dianalisis melalui perhitungan persentase perubahan (delta %) berdasarkan nilai rerata dan dibandingkan terhadap kelompok *Povidone iodine*. Data dianalisis menggunakan uji *Kruskal-Wallis* dan uji *post hoc Mann-Whitney*.

Hasil : Secara makroskopis, kelompok JM–P–CMC menunjukkan penyusutan luas luka yang lebih cepat dan konsisten dibandingkan kelompok kontrol lainnya, dengan hasil paling optimal pada fase remodeling. Secara mikroskopis, angiogenesis pada kelompok JM–P–CMC tampak aktif pada fase awal dan menurun lebih cepat pada fase berikutnya, menandakan maturasi jaringan yang lebih efektif dibandingkan *Povidone iodine*.

Kesimpulan : Formulasi kombinasi JM–P–CMC berpotensi menjadi terapi topikal alternatif yang aman dan efektif untuk penyembuhan luka sayat, dengan efektivitas yang lebih baik dibandingkan *Povidone iodine*.

Kata kunci : Angiogenesis, *Carboxymethyl Chitosan* (CMC), *Jatropha multifida* L., luka sayat, plasenta, *Povidone iodine*.

ABSTRACT

Name. : Nindya Faza Fadhila

Study Program : Medicine

*Thesis Title : Experimental Study on the Effects of a *Jatropha multifida* L. Sap–Placenta–CMC Formulation on Angiogenesis in the Wound Healing Process of Male White Rats and Its Review from an Islamic Perspective*

Background : Incisional wounds are open injuries caused by sharp objects and are associated with a risk of bleeding and infection. Wound healing is a complex process involving the inflammatory, proliferative, and remodeling phases. Povidone iodine is widely used as an antiseptic, however, its long-term use may cause tissue irritation and reduced effectiveness. Therefore, safer alternative therapies derived from natural products are needed. *Jatropha multifida* L. sap exhibits antimicrobial, anti-inflammatory, and pro-angiogenic properties, placenta is rich in growth factors, and Carboxymethyl Chitosan (CMC) functions as a biocompatible matrix. The combination of these three components is expected to enhance wound healing by stimulating angiogenesis and tissue regeneration. This study aims to evaluate the effects of a *J. multifida* L.–placenta–CMC formulation on angiogenesis and the macroscopic features of wound healing in male white rats.

Methodology : This study was a true experimental study with a quantitative approach. Experimental animals were divided into seven groups: saline, base cream, Povidone iodine, *Jatropha multifida* L., placenta, CMC, and a combination of JM–P–CMC. Macroscopic evaluation was performed daily, with photographic documentation on day 5, day 10, and day 15. Microscopic analysis of angiogenesis was conducted after animal termination using HE staining by counting blood vessels in three random fields of view. Treatment effectiveness was assessed by calculating the percentage change (delta %) based on mean values and compared with the Povidone iodine group. Data were analyzed using the Kruskal–Wallis test followed by the Mann–Whitney post hoc test.

Results : Macroscopically, the JM–P–CMC group showed faster and more

consistent wound contraction compared with other control groups, with the most optimal results observed during the remodeling phase. Microscopically, angiogenesis in the JM–P–CMC group was prominent in the early phase and declined more rapidly in subsequent phases, indicating more effective tissue maturation compared with Povidone iodine.

Conclusion : *The JM–placenta–CMC combination formulation has potential as a safe and effective alternative topical therapy for incisional wound healing, demonstrating superior effectiveness compared with Povidone iodine.*

Keywords : *Angiogenesis, Carboxymethyl Chitosan (CMC), incisional wound, Jatropha multifida L., placenta, Povidone iodine.*