

Formulasi dan Karakterisasi Capsaicin Konsentrasi Tinggi dalam Pembawa Transfersom pada Sediaan Gel = Formulation and Characterization of High Concentration Capsaicin in Transfersome Carriers in Gel Dosage Form

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Abstrak

Capsaicin topikal dengan konsentrasi tinggi (8%) efektif dalam pengobatan nyeri pada pasien Post-Herpetic Neuralgia (PHN) dan HIVAssociated Distal Sensory Polyneuropathy (HIV-DSP), namun penggunaan capsaicin ini masih menimbulkan reaksi yang tidak diinginkan pada tempat aplikasi. Penelitian ini bertujuan memformulasikan dan mengkarakterisasi capsaicin transfersom konsentrasi tinggi pada sediaan gel serta melihat hasil uji histologinya pada jaringan kulit tikus putih jantan Sprague Dawley. Formula optimum transfersom dihasilkan oleh campuran fosfolipid (Phospholipon 90G®) dan tween 80 rasio 80:20 dengan indeks polidispersitas $0,389 \pm 0,08$, ukuran partikel $183,03 \pm 25,95$ nm, potensial zeta $-33,87 \pm 0,83$ mV, dan efisiensi penjerapan $71,58 \pm 0,12$ %. Formula terpilih transfersom dibentuk ke dalam suatu sediaan gel kemudian dibandingkan dengan gel non-transfersom untuk melihat penetrasinya ke dalam kulit melalui uji sel difusi Franz. Selanjutnya, dianalisa menggunakan metode Spektrofotometri UV-Vis dengan panjang gelombang 281 nm. Berdasarkan uji sel difusi Franz, didapatkan jumlah kumulatif gel capsaicin transfersom sebesar $7572,19$ ng/cm² dan gel capsaicin non-transfersom sebesar $20326,66$ ng/cm². Nilai fluks Capsaicin transfersom adalah $329,12$ ng.cm⁻²jam⁻¹ and capsaicin non-transfersom adalah $760,08$ ng.cm⁻²jam⁻¹. Kemudian dilakukan studi histologi jaringan kulit menggunakan pewarnaan Hematoksilin-Eosin (HE) dengan melihat ketebalan lapisan epidermis, dermis, dan jumlah sel radang per 100×100 m². Uji histologi menunjukkan bahwa capsaicin transfersom memberikan gambaran keadaan sel yang lebih baik dibandingkan capsaicin non transfersom. Dapat disimpulkan bahwa komposisi Phospholipon 90G® dan tween 80 dengan rasio 80:20 menghasilkan formula optimum dari transfersom capsaicin konsentrasi tinggi. Gel capsaicin transfersom memiliki kemampuan penetrasi yang lebih lambat dibandingkan capsaicin non transfersom. Capsaicin yang dienkapsulasi dalam transfersom dapat mengurangi toksisitas capsaicin terhadap kulit.

.....Topical capsaicin with high concentrations (8%) is effective in the treatment of pain in patients with Post-Herpetic Neuralgia (PHN) and HIVAssociated Distal Sensory Polyneuropathy (HIV-DSP), but the used of capsaicin causes unintended drug reactions at the site of application. This study aimed to formulate and characterize the transfersome with high concentration capsaicin in a gel dosage form and see its histology study on skin tissue of Sprague Dawley male white rats. The optimum transfersome formula used a mixture of phospholipid (Phospholipon 90G®) and tween 80 (80:20) with polydispersity index $0,389 \pm 0,08$, particle sized $183,03 \pm 25,95$ nm, zeta potential $-33,87 \pm 0,83$ mV, and entrapment efficiency $71,58 \pm 0,12$ %. The selected transfersome formula was formed into a gel, then compared with non-transfersome gel to see the penetration into the skin through the Franz diffusion cell test. Then analyzed using spectrophotometry UV-Vis method with a wavelength 281 nm. Based on the Franz diffusion cell test, the cumulative amount of capsaicin from transfersome gel was $7572,19$ ng/cm² and non-transfersome capsaicin gel was $20326,66$ ng/cm². Flux value for transfersome capsaicin was $329,12$ ng.cm⁻²hour⁻¹ and

nontransfersome capsaicin was $760,08 \text{ ng.cm}^{-2}\text{hour}^{-1}$. Then a histology study of skin tissue was carried out using Hematoxylin-Eosin (HE) staining by looking at the thickness of the epidermal layer, dermis layer, and the amount of inflammatory cells per $100 \times 100 \text{ m}^2$. Histology study showed that transfersome capsaicin gave a better condition of skin tissue than non-transfersome capsaicin. It could be concluded that the composition of Phospholipon 90G® and tween 80 with a ratio of 80:20 resulted in the optimum formula of transfersome with high concentration capsaicin. Transfersome capsaicin gel has a slower penetration than nontransfersome capsaicin. Capsaicin encapsulated in transfersomes can reduce the toxicity of capsaicin to the skin.