Formulasi dan uji penetrasi sediaan hidrogel transdermal yang dibuat dari eksipien koproses amilosa tersambungsilang6 xanthan gum 1 : 2 = Formulation and penetration studies of transdermal hydrogel based on co processed excipient of xanthan gum and 6 cross linked amylose 1 : 2 / Ufairah Hanifah Indriatin

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Abstrak

ABSTRAK
Rute penghantaran obat transdermal membutuhkan eksipien khusus untuk menghantarkan obat melalui kulit menuju sistemik. Tujuan penelitian ini adalah membuat dan menganalisis kemampuan penetrasi hidrogel transdermal yang dibuat dari eksipien koproses amilosa tersambungsilang6 – xanthan gum (Ko-CLA6-XG) pada perbandingan 1:2 sebagai pembentuk matriks dan natrium diklofenak sebagai model obat. Uji penetrasi in vitro dilakukan menggunakan sel difusi Franz dan dianalisis dengan spektrofotometer UV. Uji penetrasi in vivo dilakukan dengan mengaplikasikan hidrogel transdermal berukuran 1 x 1 cm pada bagian abdomen tikus jantan galur Sprague-Dawley. Analisis hasil uji penetrasi in vivo dilakukan menggunakan kromatografi cair kinerja tinggi (KCKT) dengan detektor photodiode array (PDA). Hasil uji penetrasi in vitro menunjukkan jumlah kumulatif obat yang terpenetrasi selama 12 jam sebesar 7629 ± 2711 µg.cm-2 dengan fluks sebesar 655,23 ± 216,43 µg.cm-2.jam-1. Profil pelepasan natrium diklofenak dari hasil uji penetrasi in vivo memberikan konsentrasi puncak plasma (Cmax) sebesar 4,35 ± 0,94 µg.ml-1 pada 1 jam dengan nilai area di bawah kurva (AUC 0-∞) 54,35 ± 7,55 µg.ml-1.jam. Berdasarkan hasil tersebut, hidrogel transdermal dengan eksipien Ko-CLA6-XG (1:2) mampu mempenetrasikan dan mengendalikan pelepasan natrium diklofenak selama 12 jam.
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ABSTRACT
Transdermal drug delivery needs specific excipient to deliver drug through the skin. The goals of this research were produced and analyzed penetration ability of transdermal hydrogel based on co-processed excipient of xanthan gum and 6-cross-linked amylose (Co-CLA6-XG) in 1:2 composition as matrix-forming and diclofenac sodium as a drug model. In vitro penetration study was evaluated using Franz diffusion cell and analyzed by UV-spectrophotometre. In vivo penetration study was performed by applying a transdermal hydrogel in size of 1 x 1 cm on the abdomen of Sprague-Dawley rats. Plasma concentration of diclofenac was analyzed by high-performance liquid chromatography (HPLC) with photodiode array (PDA) detector. In vitro penetration study showed that the cumulative drug permeated across the skin for 12 hours was 7629 ± 2711 µg.cm-2 with flux 655.23 ± 216.43 µg.cm-2.hours-1. The results of in vivo study showed that maximum plasma concentration (Cmax) was 4.35 ± 0.94 µg.ml-1 during 1 hour and area under curve (AUC 0-∞) was 54.35 ± 7.55 µg.ml-1.hour. According to the results, it can be concluded that transdermal hydrogel based on Co-CLA6-XG (1:2) excipient is able to deliver and penetrate diclofenac sodium release during 12 hours.