# Hidrogel transdermal dengan eksipien sambungsilang-6 dari koproses amilosa-xanthan gum dan uji penetrasinya secara in vitro dan in vivo = Development of transdermal hydrogel based on 6-cross-linked excipient of co-processed amylose-xanthan gum and its penetration study

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Abstrak

Sistem penghantaran obat transdermal saat ini banyak digunakan sebagai alternatif terhadap terapi konvensional (oral) untuk menghindari masalah seperti efek samping, metabolisme lintas pertama, dan kurangnya kepatuhan pasien.Penelitian ini bertujuan untuk mengembangkan sediaan hidrogel transdermal yang mengandung natrium diklofenak serta mengevaluasi penetrasi perkutan secara in vitro dan in vivo. Matriks sediaan hidrogel dibuat dari eksipien sambungsilang-6 dari koproses amilosa dan xanthan gum (CL6-Ko-A-XG). Hidrogel yang dibuat diuji penetrasinya secara in vitro melewati kulit tikus dengan menggunakan metode sel difusi Franz. Selanjutnya, dilakukan uji penetrasi secara in vivo menggunakan tikus Sprague-Dawley jantan (n=6) selama 12 jam. Analisis kadar natrium diklofenak dalam plasma tikus dilakukan dengan menggunakan kromatografi cair kinerja tinggi (KCKT). Berdasarkan hasil uji penetrasi secara in vitro, diperoleh jumlah kumulatif natrium diklofenak yang terpenetrasi 5890 ± 0,8 g/cm2 dan fluks pada kondisi tunak 528 ± 72,5 g/cm2/jam. Selanjutnya, dari hasil uji penetrasi in vivo diperoleh nilai area di bawah kurva (AUC0-t) natrium diklofenak yakni 47,94 ± 16,5 g/mL jam. Maka, dapat disimpulkan bahwa hidrogel yang terbuat dari eksipien CL6-Ko-A-XG dapat menghantarkan natrium diklofenak hingga sirkulasi sistemik d. ..... Transdermal drug delivery system can be an alternative to conventional (oral) therapy in order to avoid problems such as side effects, first pass metabolism, and poor patient compliance. The purpose of this study was to develop transdermal hydrogels containing diclofenac sodium and evaluate the in vitro and in vivo percutaneous penetration. The hydrogels matrices were prepared from 6-crosslinked of co-processed amylose-xanthan gum (CL6-Ko-A-XG). The hydrogels were subjected to in vitro penetration through rat skin using Franz diffusion cell. Furthermore, in vivo penetration study was carried out in male Sprague-Dawley rats (n=6) during 12 hours. In vivo drug plasma concentrations were determined using high performance liquid chromatography (HPLC). Based on the results of the in vitro study, the cumulative amount of diclofenac sodium penetrated was 5890 ± 0.8 g/cm2 and flux at steady state condition was 528 ± 72.5 g/cm2 hour. Moreover, the results of in vivo study showed that the area under curve (AUC0-t) was 47.94 ± 16.5 g/mL hr. In conclusions, hydrogels which were formulated using CL6-Ko-A-XG could deliver diclofenac sodium into systemic circulation. According to the results, CL6-Ko-A-XG has a potential to be developed as matrices in transdermal system.