Design and Characterization of Transdermal Films Containing Ketorolac Tromethamine

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Abstract:

The objective of this work was to develop suitable film formulations of ketorolac tromethamine (KT) for transdermal use and to investigate the effect of film composition and permeation enhancers on the in-vitro release and skin permeation of the drug. Polyvinyl alcohol (PVA), sodium carboxymethylcellulose (NaCMC), and chitosan were used as film-forming polymers. The adhesive hydrophilic polymers plastoid® E35L (PL E35) and polyvinyl pyrrolidone (PVP) were added to improve bioadhesion. The permeation enhancers used were oleyl alcohol (OA), sodium glycocholate (NaGC) and propylene glycol (PG). Formulated films were characterized by measuring their mean thickness, mass, drug content, folding endurance and bioadhesion. In-vitro release was studied using the USP XXIII rotating paddle method and in-vitro permeation across hairless rat skin was studied using an in-vitro diffusion cell. Addition of PVP enhanced the drug release and permeation especially in case of chitosan, while Plastoid® E35L improved permeation only. Skin permeation of the drug was greatly improved by the addition of permeation enhancers, the rank of their effectiveness was: sodium glycocholate (Na GC) > oleyl alcohol (OA) > propylene glycol (PG). The results obtained showed that these polymeric films can be a promising therapeutic system for the transdermal delivery of ketorolac.

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