Development and Evaluation of Ethosomal Gel of Lornoxicam for Transdermal Delivery: In-Vitro and In-Vivo Evaluation

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Abstract

Abstract: Lornoxicam is a non-steroidal anti-inflammatory BCS-II class drug, having low solubility and high permeability. The aim of present investigation was to develop ethosomal gel of lornoxicam, for its transdermal delivery. The ethosomal formulations were prepared by hot method using phospholipid and ethanol (20% to 40%) and then evaluated for entrapment efficiency, vesicular size, shape, in-vitro skin permeation, skin retention, drug-membrane component interaction and stability. FT-IR studies revealed no interaction between the drug and excipients. Transmission electron microscopy (TEM) confirmed the three dimensional nature of ethosomes. The sonicated ethosomal formulation ET7 was selected for further skin permeation studies as it exhibited highest percentage of drug entrapment (93.96%) and small particle size (100±3.9 nm). Formulation ET7 containing 2% w/w phospholipid and 30% alcohol showed highest percentage of drug permeation (74.18%) at the end of 24 hours. The ethosomal vesicles were incorporated in carbopol gel base and its anti-inflammatory efficiency was compared with the plain lornoxicam gel. The pharmacodynamic studies showed the enhanced anti-inflammatory activity of ethosomal gel compared to the plain gel formulation. Stability studies carried out at two different temperatures, showed no significant change in entrapment efficiency of vesicles at the end of 3 months, indicating that all the formulations were physiochemically stable. The results obtained suggested that the ethosomes could be an efficient carrier for transdermal delivery of lornoxicam in the treatment of inflammation compared to plain gel.

Keywords: Lornoxicam, phospholipid, ethanol, ethosomes, sonication.