Extended Release Niosomal Hydrogel for Ocular Targeting of Piroxicam: In vitro and Ex vivo Evaluation

Abstract

This study aimed at the investigation of piroxicam-niosomal hydrogel for ocular targeting to prolong and enhance its local analgesic activity. Various formulations were prepared, characterized and evaluated ex vivo for their transocular permeation using excised cow cornea. The prepared niosomes had distinct spherical multi-lamellar shape and mean vesicle size between 1.25±0.81µm and 7.47±0.85µm. Relevant increase in drug EE% was obtained with increase of cholesterol content and surfactant's hydrophobicity. Drug retention in vesicles was significantly ($p<0.05$) higher at refrigerated condition than that at the room temperature. Prolonged drug release was achieved with high niosomal cholesterol content and the mechanism of drug release can be described as Fickian diffusion. The niosomal hydrogel showed 3.7 Permeability Improvement Ratio comparing to piroxicam aqueous suspension. The optimized niosomal gel showed prolonged drug release and enhanced piroxicam ocular bioavailability due to the formation of an amorphous drug form within the gel.