Abstract

The purpose of this study was to investigate the development and evaluation of proniosomal gel for transdermal iontophoretic drug delivery. Three different analgesic drugs namely, naproxen, lornoxicam and tramadol HCl were chosen as the model drugs. The proniosomal structure was liquid crystalline-compact niosomes hybrid which could be converted into niosomes upon hydration. The system was evaluated for EE, vesicle size, zeta potential, microscopy (optical and TEM), DSC, *in-vitro* release, *ex-vivo* permeation across goat skin and rate of hydration (spontaneity). The effect of composition of formulation, type of surfactant, amount of surfactant, amount of drug, amount of lecithin and amount of cholesterol on transdermal permeation profile was observed. The stability studies were performed at refrigerated and at room temperature (37°C). *In-vivo* assessment of anti-inflammatory effect and antinociceptive activity were also studied. The use of proniosomal gel as a vehicle for the transdermal iontophoresic delivery was evaluated *in-vitro*. The characteristics of the applied electric current, such as density, type, frequency, and on/off interval ratio were observed. The study confirms the synergistic effect of proniosomes and iontophoresis in improving the transdermal permeation profile of selected analgesic drugs. It is concluded that proniosomal gel can be used as a vehicle for transdermal iontophoretic drug delivery under suitable electric conditions.