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Development and Optimization of Microemulsion Formulation using Box-Behnken Design for Enhanced Transdermal Delivery of Lornoxicam

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***SUMMARY*. The purpose of present study is to optimize microemulsion of poorly water soluble NSAID, lornoxicam. The microemulsion was optimized using three factor, three level Box Behnken statistical design. Independent variables were oil, surfactant and cosurfactant mixture (Smix) and water, while dependent variables were cumulative quantity permeated through rabbit skin, flux and lag time. Microemulsion was prepared using almond oil, Tween20 (surfactant) and dimethylsulfoxide (DMSO) (co-surfactant) and water. The ranges of pH, conductivity, droplet size, polydispersity index and viscosities was found to be 4-5, 102-205 *µ*siemens/cm, 50-90 nm, 0.120-0.350 and 50-430 cp, respectively, of all Box-Behnken derived formulations. *In vitro* release studies on Franz cell showed the optimized formulation consisted of 20% almond oil, 54% Smix (Tween20 and DMSO in 3:1) and 27% water. The cumulative quantity permeated, flux and lag time of the optimum formulation was found to be 8503 *µ*g, 229 *µ*g/cm2 h and 0.41 h. The results indicated that microemulsion containing DMSO as permeation enhancer is promising vehicle for enhanced transdermal delivery of Lornoxicam.**

KEY WORDS: Box-Behnken design, DMSO, Lornoxicam, Microemulsion.

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