

Basarkar GD, Shirsath GN, Patil SB. Development of microspheres containing diclofenac diethylamine as sustained release topical formulation. *Bull. Pharm. Res.* 2013;3(1):14-22.

Abstract: The aim of present work was to formulate diclofenac diethylamine microspheres using a natural wax, to be applied topically on the skin for the purpose of sustaining its release to avoid the side effects resulting from the oral administration of the drug and also to reduce the dosing frequency. Wax collected was purified using reported method and evaluated for physicochemical parameters. Drug excipients compatibility was performed using IR and DSC study. Following preliminary evaluations on process conditions for preparation of microspheres by cooling induced solidification technique, a 3² full factorial design was employed to investigate the influence of the formulation variables like concentration of wax and concentration of Tween 80 on the particle size, entrapment efficiency and drug release. Developed formulation followed Higuchi model for drug release from microspheres. Further, these microspheres were dispersed in carbopol 934 gel (1% w/w). The gel was evaluated for appearance, homogeneity, pH, spreadability, viscosity, drug content uniformity and *in vitro* drug diffusion study. Korsmeyer-Peppas equation was followed for *in vitro* drug diffusion from gel containing microspheres. Diffusion coefficient of Korsmeyer-Peppas equation indicated that the non-Fickian mechanism was basically involved in the drug release from gel containing microspheres.

Key words: Diclofenac diethylamine, Sustained release microspheres, Cooling induced solidification technique, Rice bran wax.

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*Author to whom correspondence should be addressed:

Dr. Ganesh D. Basarkar (basarkarg@yahoo.com)

Professor & Head, Department of Pharmaceutics,

SNJB's Shriman Sureshdada Jain College of Pharmacy, Neminagar, Chandwad,

Nashik, Maharashtra, India