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Nanoemulsion Based Emulgel Formulation of Lipophilic Drug for Topical Delivery

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Abstract : Objective: The aim of the present work was to investigate the potential of flurbiprofen loaded nanoemulsion based emulgel for topical delivery. In order to improve the solubility, and increasing the bioavailability of drug nanoemulsion based emulgel was formulated.

Methods: Flurbiprofen loaded nanoemulsion were successfully prepared by using high pressure homogenizer. Selection and area of nanoemulsion based emulgel was identified by constructing pseudo ternary phase diagram in which varying concentration of oil, surfactant, co surfactant and distilled water, andthe drug concentration was same in all the formulations. The prepared nanoemulsion was subjected to the various thermodynamic stability studies. The nanoemulsion formulations were evaluated for their particle size analysis, turbidimetric evaluation, transmission electron microscope, and viscosity. The emulgel was selected by performing the spreadability test and swelling index determination. The prepared nanoemulgel were further evaluated for their pH, drug content, viscosity, *in-vitro* and *in-vivo* studies. The in-vitro skin permeation study of the optimized formulation was compared with that of marketed gel.

Results: A significant increase in permeability was observed in optimized nanoemulsion based emulgel (84%).The anti – inflammatory effect of the formulation F1 showed a significant increase ($p<0.05$)in percent inhibition value after 12 hours when compared with marketed gel and nanoemulsion based emulgel on carrageenan induced paw edema of rats.

Conclusion: These results suggested that nanoemulsion based emulgel have great potential for topical delivery of flurbiprofen.

Keywords: nanoemulsion, emulgel, flurbiprofen, topical delivery.

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