



Investigation of Enhancing Effect of Glucam® P-20 on the *In Vitro* Skin Permeation of Diclofenac Sodium Microemulsions

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SUMMARY. The aim of this work was to investigate the potential of Glucam® P-20 as a skin penetration enhancer for diclofenac sodium microemulsions across excised newborn pig skin. Glucam® P-20 (GP-20) or PPG-20-methyl glucose ether is generally used as a humectant, emollient and fragrance fixative. The w/o microemulsions composed of Tween 80, Eutanol G and water were formulated. The concentration of diclofenac sodium was 1 % w/w while the amounts of GP-20 were varied from 0-20 % w/w, ME-1 (0 %), ME-2 (5 %), ME-3 (10 %) and ME-4 (20 %). All microemulsions were transparent with Newtonian flow behaviour. The mean droplet sizes of the microemulsions were about 200 nm. The FTIR spectra of the microemulsions containing GP-20 were not markedly different from those of the microemulsion without GP-20, ME-1. The *in vitro* release and skin permeation studies of diclofenac sodium loaded microemulsions were investigated using modified Franz diffusion cell. For the *in vitro* release across synthetic membrane, the rank order of the release rate was ME-4 > ME-3 > ME-2 > ME-1. For the *in vitro* skin permeation experiments, GP-20 at 10 % and 20 % could markedly enhance the percutaneous absorption of the drug. The optimum concentration of GP-20 was 10 %. GP-20 is proposed as a potential skin penetration enhancer for percutaneous absorption of diclofenac sodium.

KEY WORDS: Diclofenac sodium, Microemulsions, Glucam® P-20, Skin penetration enhancer.

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