NS.SCI.6

INVESTIGATION OF THE POTENTIAL ABILITY OF A MICROEMULSION FORMULATION, FOR TRANSDERMAL DELIVERY OF DICLOFENAC SODIUM

E. P. N. Premarathne[1], A. D. L. Chandani Perera[1,2], D. N. Karunaratne[1,2]

[1]Postgraduate Institute of Science, University of Peradeniya
[2]Department of Chemistry, Faculty of Science, University of Peradeniya

A microemulsion is a system of water, oil, and amphiphilic compounds (surfactant and co-surfactant) which is a transparent, single optically isotropic, and thermodynamically stable liquid.Microemulsions are excellent systems for drug delivery because of their improved drug solubilisation, long shelf life and ease of preparation and administration. Assessment of percutaneous permeation of molecules is one of the main steps in the initial design and later in the evaluation of dermal or transdermal drug delivery systems. The aim of the present study was to investigate a microemulsion formulation for transdermal delivery of diclofenac [2-(2,6-dichloranilino) phenylacetic acid] sodium which is a nonsteroidal anti-inflammatory drug commonly taken to reduce inflammation and pain.

The microemulsion area was identified by constructing pseudo-ternary phase diagrams of water, olive oil and Span 80. One composition in the microemulsion region was selected from the phase diagram for further studies. Transdermal permeation of diclofenac sodium through the skin of the pig ear was compared with the commercially available diclofenac gel (DICLORAN* Gel) using Franz diffusion cell.

A significant increase in permeability parameters such as steady-state flux (J_{ss}), permeability coefficient (K_p), and average permeation was observed in the optimized microemulsion formulation which consisted of 79% (wt/wt) of olive oil, 10% (wt/wt) of Span 80, 10% (wt/wt) of distilled water and 1% (wt/wt) of Diclofenac sodium.

Funding: NSF Grant No: RG/2011/BS/02.