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Research Article

Formulation and evaluation of topical Calcineurin inhibitor loaded transfersomal drug delivery for Vitiligo

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ABSTRACT

The aim of the present investigation was to formulate and evaluate topical calcineurin inhibitor loaded transfersomal drug delivery for vitiligo using rota evaporator followed by thin film method. Tacrolimus can restore the melanocytes if given in transfersomal gel. Fourier transform infrared spectroscopy (FTIR) had employed to study drug-excipients incompatibility. Analytical method was performed using UV spectrophotometer. Topical calcineurin inhibitor loaded transfersomal gel was evaluated for particle size, zeta potential, percent drug entrapment, surface morphology, in-vitro drug release study, in vitro permeability study and stability study. Optimization of process parameter was done by 3^2 full factorial Design Expert software. Topical calcineurin inhibitor was successfully prepared with drug:lipid(1:10), lipid:surfactant(9:1), water as hydration medium, chloroform:methanol(9:1) as solvent, HPMCK100 as mucoadhesive agent and extract of catechu powder to provide colour on skin. Optimization study of process parameter shows that batch prepared with hydration time 55 min, evaporation time 15 min, hydration temperature is 50°C and temperature to form thin film is 60°C as optimum condition for rota evaporator. Particle size, zeta potential, percent drug entrapment were found to be 155.5 nm, -49 mV, 80% respectively for optimized batch.

Keywords: Vitiligo, Tacrolimus, Transfersomal gel, Thin film hydration method, Vesicle size, PDE, Zeta-potential, Skin irritation study, Skin sustain study, Stability study.