

**Proniosomal Topical Gel of Tacrolimus for Atopic Dermatitis****Submitted By**

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**Abstract**

Atopic dermatitis (AD, a type of eczema) is an inflammatory, relapsing, non-contagious and pruritic (itchy) skin disorder. Tacrolimus is the widely used drug for the treatment of the atopic dermatitis which inhibits the T cell activation thus suppressing inflammation. However, the most common adverse effects of Tacrolimus are burning sensation and pruritus at application site, which prompt for development of novel carrier that could effectively target Tacrolimus to site of action without producing undesirable side-effects. The aim of present study was to prepare and evaluate the proniosomal topical gel of Tacrolimus for the treatment of atopic dermatitis which could enhance the permeation of the drug through skin and reduce the burning sensation and pruritus at the site of the application. The drug excipient compatibility was determined using FTIR. The proniosomal gel was prepared by coacervation phase separation method using phospholipon 90G (soya lecithin), span 60 and cholesterol as main components. The proniosomal gel was characterized for particle size, zeta potential, percentage entrapment entrapped (%EE) and in vitro drug release study. The optimized proniosomal gel was incorporated in structured vehicle like HPMC K100M (2%w/v) and proniosomal gel loaded in HPMC K100M gel base was characterized for viscosity, pH, spreadibility and in vitro drug release study. Skin irritation study of proniosomal gel and marketed formulation was carried out in albino wistar rats for 24 hours. FTIR spectra did not indicate any incompatibility between drug and excipients. The vesicle size, zeta potential and percentage entrapment entrapped (%EE) were found to be 166.0 nm, -13.5 mV and 76.31 % respectively. The pH, viscosity and spreadibility were found to be 6.2, 31.164

Pa/s and 5.28 gm.cm/sec respectively. The in vitro release was found to be 85.55 % after 24 hours. The proniosomal gel was stable at refrigeration temperature. The skin irritation study showed that the proniosomal gel produced the less irritation as compared to the marketed formulation. The present investigation provides a practical approach for direct delivery of Tacrolimus encapsulated in proniosomal gel for safe delivery at the site of action.

Keywords: proniosomal gel, atopic dermatitis