ABSTRACT

Topical dosage forms with prolong action have been an attractive alternative for drug delivery, particularly for the patients suffering from dermatological problems. Embelin is the major constituent of the Vidang which is used to prevent and treat fungal skin infections. Hence, Vidang was chosen as a drug to formulate topical drug delivery system.

Topical drug delivery systems of Vidang, an antifungal drug in the form of gel and cream were formulated and evaluated for physical appearance, pH measurements, viscosity measurements, spreadability, drug content, *in vitro* diffusion study through cellophane membrane.

By using 3^2 factorial design, topical gels of Vidang were prepared using carbopol 934 (1.2, 1.6, 2%) as a gelling agent and propylene glycol (8, 12, 16%) as a co-solvent. Both independent variables, amount of carbopol 934 and amount of propylene glycol, had an influence on the three dependent variables, viscosity, time required for 50% release of drug ($T_{50\%}$) and drug release at 1 hr (DR_1). On the basis of % similarity with maximum desirability of dependant variables, formulation containing 1.6% carbopol 934 with 12% propylene glycol was selected as an optimized formulation (OF).

By using 3^2 factorial design, topical creams of Vidang were prepared using stearic acid (2, 6, 10%) and propylene glycol (2, 7, 12%). Both independent variables, amount of stearic acid and amount of propylene glycol, had an influence on the three dependent variables, viscosity, time required for 50% release of drug ($T_{50\%}$) and drug release at 1 hr (DR_1). On the basis of % similarity with maximum desirability of dependant variables, formulation containing 6% stearic acid with 10% propylene glycol was selected as an optimized formulation (OC).

Both optimized formulations OF and OC were evaluated for *in vitro* diffusion study, *Ex vivo* permeation study, *in vitro* antifungal study and other measurable parameters. Stability studies were carried out at 25^0C/60% RH and 40^0C/75% RH for both optimized formulations OF and OC for 3 months. The results during stability studies clearly indicate that there was no significant change found in general appearance, drug content, pH, viscosity and *in vitro* diffusion profile.

The optimized gel and cream herbal formulations can be considered as promising aspect for topical delivery of Vidang extract.

Key words: Vidang, Topical drug delivery system, 3^2 factorial design, DR_1, $T_{50\%}$.