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Formulation, Development and Evaluation of Film-Forming Gel for Prolonged Dermal Delivery of Miconazole Nitrate

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Abstract : The localized treatment of diseases of body tissues requires that the pharmaceutical active be maintained at the site of treatment for an effective period of time. Sweat, clothing, movements and getting washed away easily on contact with water are some of the problems that have limited the effectiveness and residence time of conventional topical formulations for treatment of fungal infections of skin. This necessitates longer treatment duration. Hence, a composition that adheres to skin surface afflicted and provides localized delivery of an antifungal agent is needed. The present work aims at designing a dosage form of Miconazole nitrate referred to as a 'film-forming gel' which on application forms a thin, transparent film on skin surface. Eudragit RS PO and hydroxypropyl cellulose were used in combination to provide a matrix film that would permit the release of the antifungal agent for a prolonged time. The formulations were prepared using 3^2 full factorial design. They were tested for drying time, drug release, antifungal activity, skin irritation and stability studies. The gel was characterised for pH, viscosity, drug content, effective dosage volume and mechanical properties of the film formed after application; water vapour permeability were also tested.
All the formulations showed results within acceptable range for various tests. The optimized formulation showed drug release of 99.76% and antifungal activity in terms of efficacy as 98.78%. Such a formulation can be claimed to decrease duration of therapy, will be more accepted by the patients and be a breakthrough in treating fungal infections of the skin.
Keywords : Miconazole nitrate ; Fungal skin infections; Film-forming gel; Eudragit RS PO;Hydroxypropyl cellulose.

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