OBJECTIVES

Many viral infections and diseases are affecting the healthy normal lifestyle of human-beings. Oral, systemic and topical routes for antiviral agents are available for many viral infections. Human Herpes Simplex Virus infections where topical treatment of antiviral agents should be beneficial include herpes genitalis, herpes labialis and herpetic keratitis. When infection is limited to the skin, topical therapy should be considered because of convenience in application and reduced drugs systemic side effects. However systemic antiviral treatment is preferred to treat cervical or intraoral lesions.

Topical drug delivery has been used as a route of medicinal delivery for many years and it has gained importance in past many years. The transdermal drug delivery has gained considerable advances in recent years. It has potential advantages over conventional drug delivery systems like avoiding hepatic first pass metabolism, maintaining constant blood levels for prolonged period of time, reduction in dosing frequency, improved bioavailability and decreased gastrointestinal irritation.

Skin irritation and less cosmetic appearance are the major disadvantages of transdermal drug delivery systems. The main focus of recent advances with traditional passive transdermal drug delivery is reducing skin irritation and making product more aesthetically acceptable by the patients.

An approach for promoting permeation through skin of poorly penetrating drug molecule is the formulation of a suitable delivery vehicle, or incorporation of a chemical enhancer into transdermal delivery systems.

In the skin, the biochemical order of the intercellular lipid matrices of the stratum corneum or keratinized environment of the corneocytes must be altered to allow the penetration of compounds at a suitable rate to the desired site of activity. Diffusion of drugs with low solubility and affinity for the hydrophilic and lipophilic components of stratum corneum would partition at slow rate. Chemical permeation enhancers promote
drug partitioning into the stratum corneum. They also partition into stratum corneum and affect the intrinsic diffusional barrier properties of skin structure. Chemical enhancers may act by spatial disruption of the normally ordered arrangement of the intercellular lipid molecules. Different permeation enhancers to be used in present study are polyethylene glycol derivative, menthol, N-methyl-2-pyrrolidone.

Iontophoresis technique is the one which can promote the flux of compounds across the skin, even for hydrophilic compounds. The technique facilitates the movement of charged molecules across the transdermal membrane under the influence of externally applied potential difference. A very minute current (0.5 mA/cm²) is applied through a reservoir containing drug by two electrodes placed at a distance on the skin. Ionized molecules will permeate by repulsion force of electrodes. Iontophoresis has been particularly effective in treatment of palmoplantar hyperhidrosis. Today the treatment of hyperhidrosis is most successful and popular application of iontophoresis in dermatological medication. In addition to local indication, iontophoresis is also capable for systemic delivery of drugs. Apart from ionized molecules, unionized molecules can also be delivered by electroosmotic flow of solvent created in this technique.

Topical cream formulation containing antiviral drug is available in market. Objective of this research work is to prepare gel formulation containing antiviral drug and chemical permeation enhancers. The gel formulation further facilitates drug penetration iontophoresis technique by providing more hydrophilic medium for drug delivery.

The drug containing gel will be prepared by selected polymer, chemical permeation enhancer and other suitable excipients. Different gel formulations containing different permeation enhancers will be prepared and compared for optimum drug amount diffusion through animal skin by in vitro study. Formulations would be characterized for different physicochemical parameters. Effect of applied current on drug permeation from prepared gel through the skin would be evaluated. Combined effect of chemical permeation enhancers and iontophoresis on drug flux is going to be studied further.