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REVIEW ARTICLE

THEORETICAL ASPECTS OF TRANSDERMAL DRUG DELIVERY SYSTEM

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Transdermal patch is a medicated adhesive patch that is placed on the skin to deliver the drug through the skin in order to achieve systemic absorption of drug at a predetermined rate over a prolonged period of time. Its main advantages includes controlled drug release with minimum side effects, improved bioavailability, bypass first pass metabolism and many more. There are factors such as physiochemical as well as biological which affect the bioavailability of transdermal medicament. Due to technological advancement, many new techniques which have attained attention are iontophoresis, phonophoresis, electroporation micro needles etc. Different types of transdermal patches can be prepared by varying methods. Transdermal patches can be evaluated by interaction studies, folding endurance, thickness of the patch, weight uniformity, drug content and *in vitro* studies. This review covers general aspects like advantages, methods of preparation of transdermal patches, evaluation, basic components of transdermal drug delivery system.

Key words: Transdermal delivery, Skin, Controlled release, Transdermal patch, Franz diffusion cell.

INTRODUCTION

The most common and popular route of drug delivery is the oral route. However, this route of administration suffers from some significant drawbacks including first pass metabolism and drug degradation in gastrointestinal tract due to enzymes, pH etc.

To overcome these difficulties, a novel drug delivery system was developed (Chien, 1992; Banker, 1990; Guy, 1996). In transdermal drug delivery system (TDDS), transdermal patch or skin patch is a medicated adhesive patch that is placed on the skin to deliver drug through the skin and to the systemic circulation at a predetermined rate over a prolonged period of time.

Transdermal delivery provides a leading edge over injectables and oral routes by increasing patient compliance and avoiding first pass metabolism respectively (Jain, 2001; Allen Jr. *et al* 2001). Transdermal patch consists of a special membrane to control the rate at which the drug contained in the reservoir within the patch can pass through the skin and then into the bloodstream.

A drug is applied in a relatively high dose inside of a patch, which is worn on the skin for an extended period of time. Through a diffusion process, the drug enters the bloodstream directly through the skin. Since there is high concentration in the patch and low concentration in the blood, the drug will keep diffusing into the blood for a long period of time, maintaining the constant concentration of drug in the blood flow. Some drugs must be combined with substances, such as alcohol, that increase their ability to penetrate the skin in order to be used in a skin patch.

Transdermal patches were developed in the 1970s and the first was Transderm-SCOP which was approved by the FDA in 1979 for the treatment of motion sickness and nausea. It was

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