



REVIEW ARTICLE

ETHOSOMES: NOVEL VESICULAR CARRIER FOR ENHANCED TRANSDERMAL DRUG DELIVERY SYSTEM

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The dermal route has been recognized as one of the highly potential routes of systemic drug delivery and provides the advantage of avoidance of the first pass effect, ease of use and withdrawal (in case of side effects), and better patient compliance. The skin, in particular the stratum corneum, poses a formidable barrier to drug penetration thereby limiting topical and transdermal bioavailability. Ethosomes are non-invasive delivery carrier system which is mainly used for delivery of drug to the systemic circulation. Ethosomes have higher quantity of ethanol. Ethanol penetration of drug into the stratum corneum by increases the fluidity of cell membrane lipids. The present review includes the composition, mechanism of penetration, advantages, method of preparation and characterization of ethosomes. The applications of ethosomes for various type of drug delivery, cosmetics use and marketed preparations are also described.

Key words: Transdermal drug delivery, Ethosome, Stratum corneum, Permeation enhancement.

INTRODUCTION

Skin is the largest human organ and consists of three functional layers: epidermis, dermis, and subcutis. It has a wide variety of functions. One major task of the skin is to protect the organism from water loss and mechanical, chemical, microbial and physical influences. The protective properties are provided by the outermost layer (epidermis) of the skin (Engstrom *et al* 2000). Dermal drug delivery is used for the treatment of various skin diseases. This has the advantage that high concentrations of drugs can be localized at the site of action, reducing the systemic side effects. Transdermal drug delivery system can be used as an alternative delivery of drug into the systemic circulation (Nandy *et al* 2009; Mohabe *et al* 2011; Talegaonkar *et al* 2011).

Transdermal drug delivery offers many advantages as compared to traditional drug delivery systems, including oral and parenteral drug delivery system. Transdermal route is a

better alternative to achieve constant plasma levels for prolonged periods of time, which additionally could be advantageous because of less frequent dosing regimens (Cal *et al* 2008). Advantages claimed are increased patient acceptability, avoidance of first pass metabolism, predictable and extended duration of activity, minimizing side effects and utility of short half-life drugs, improving physiological and pharmacological response, avoiding the fluctuation in drug levels. The barrier function govern by stratum coneum is main problem for delivery of drugs across the skin. The stratum corneum consists of corneocytes surrounded by lipid layers, which play an essential role in the barrier properties of the stratum corneum (Wertz, 2000; Williams and Elias, 1987; Pilgram *et al* 1999).

In order to increase the number of drugs administered via transdermal route, novel drug delivery systems have to be designed. These systems include use of physical means, such as