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RESEARCH ARTICLE

CHARACTERIZATION AND *EX-VIVO* SKIN PERMEATION STUDY OF DOMPERIDONE MALEATE TRANSDERMAL PATCH

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The present study was designed to develop a suitable matrix type transdermal drug delivery system (TDDS) of domperidone maleate using blends of three different polymeric combinations of polyvinylpyrrolidone (PVP) and ethylcellulose (EC). Physical studies including moisture content, moisture uptake and flatness to study the stability of the formulations were performed. *In-vitro* dissolution as well as *ex-vivo* skin permeation studies of the experimental formulations were also performed. *Ex-vivo* skin permeation study was conducted across the depilated rat abdominal skin using a modified Franz's diffusion cell. Drug-excipient interaction studies were carried out using TLC (Thin Layer Chromatography) method. All the formulations were found to be suitable for formulating in terms of physicochemical characteristics and there was no significant interaction noticed between the drug and polymers used. It was observed that as the concentration of the hydrophilic polymer (PVP) increased in the formulation, the rate of dissolution increased subsequently and the best result found for the polymer ratio PVP:EC, 3:5. From the study of release mechanism, it was found that the Higuchi plot showed reasonably straight line with high correlation coefficient. *Ex-vivo* skin permeation study also shows that the permeation of the drug (Domperidone maleate) through the depilated rat abdominal skin was reasonably better in the formulation where PVP concentration was high. It was also found that there was no significant reaction developed during the contact of patch with the dermis. Hence, it can be reasonably concluded that domperidone maleate can be formulated into the transdermal matrix type patches to sustain its release characteristics and the polymeric composition (PVP:EC, 3:5) was found to be the best choice for manufacturing transdermal patches of domperidone maleate among the formulations studied.

Key words: Domperidone maleate, Transdermal patch, Polyvinylpyrrolidone, Ethyl cellulose, *Ex-vivo* skin permeation, Franz diffusion cell.

INTRODUCTION

Transdermal drug delivery is the delivery of drugs across epidermis to achieve systemic effects. The success of transdermal patches lies in their commercialization. Transdermal patches control the delivery of drugs at controlled rates by employing an appropriate combination of hydrophilic and lipophilic polymers (Mohabe *et al* 2011). For many medications, it is important that the administration regime is as simple and non-invasive as possible in order to maintain a high level of compliance by a patient. Oral administration is one that is commonly used because it is a relatively simple regime to follow. However, the oral administration route is also complicated because of the complications associated with gastrointestinal irritation, drug metabolism in the liver and is also impractical if a patient is vomiting or nauseous.