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Feasibility Assessment of Ondansetron Hydrochloride Transdermal Systems: Physicochemical Characterization and *In vitro* Permeation Studies

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SUMMARY. The present investigation aims at feasibility assessment of ethyl cellulose (EC) and polyvinylpyrrolidone (PVP) based ondansetron hydrochloride matrix type transdermal systems. The effects of polymeric concentration, its blend and drug loading dose on the *in vitro* drug permeation from the transdermal patches has been investigated. Ratio of EC: PVP and drug loading dose were selected as independent variables and their influence on the amount drug permeated at 24 h, permeation flux and steady state permeability coefficient were studied using experimental design. Various physicochemical parameters were studied to assess the feasibility of the transdermal systems. Ratio of EC: PVP was found to be the main influential factor for all the dependent variables studied. Drug loading dose was also found to influence the dependent variables but to a lesser extent. Physicochemical parameters of the prepared patches were evaluated and found satisfactory. Fourier transform infrared spectroscopy, scanning electron microscopy and X-ray diffraction studies confirmed amorphous state of ondansetron in the transdermal system. The study indicated the need for permeation enhancement techniques to meet the clinical requirement.

KEY WORDS: FT IR, Ondansetron hydrochloride, Permeation, SEM, Transdermal delivery, XRD.

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