FORMULATION AND EVALUATION OF MUCOADHESIVE *IN SITU* NASAL GEL OF CYLOBENZAPRINE HYDROCHLORIDE

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Abstract:

The aim of the study was to formulate and develop Thermoreversible nasal in situ gel of Cyclobenzaprine hydrochloride by cold method which may improving the bioavailability and avoidance of the first pass metabolism. Drug excipient compatibility study was carried out using Fourier transform infrared spectroscopy which shows that neither drug decomposition nor drug-excipients and excipients-excipients interactions occurred in the formulation. Thermoreversible nasal in situ gel of Cyclobenzaprine hydrochloride containing Poloxamer 407 was used as the gelling agent gives excellent thermo sensitive gelling effect and Hydroxyl Propyl Methyl Cellulose K4M was used as a mucoadhesive Polymer gives good mucoadhesivity to the formulation and increase nasal residence time of the formulation. Quick release of drug was achieved by PEG 400 used as a permeation enhancer. 3^2 Factorial designs were apply for optimization of the concentration of HPMCK4M and PEG400. In situ gel based formulation of Cyclobenzaprine Hydrochloride was evaluated for clarity, pH ,Drug Content ,Gelling Temperature, mucoadhesive force,% drug release ,histopathological study and stability study. An optimized formulation containing 18% poloxamer 407 , 0.4 % HPMCK4M and 1% PEG was found to be good in terms of clarity, pH (5.8), gelation temperature (32^0C), mucoadhesive force (736 Dyne/cm^2), Drug content (96.87),% Cumulative drug released (94.05% in 5 hr with a flux of 0.122 mg/cm^2/min) and had no cellular damage as indicated by histopathological study. The optimized formulation was stable for 21 days in accelerated conditions.

Keywords: Cyclobenzaprine hydrochloride, Thermo sensitive, nasal *insitu* gel, Poloxamer 407, HPMCK4M, PEG, sustain release.