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Development and Evaluation of Fluoxetine Hydrochloride Loaded Solid Lipid Nanoparticles For Nasal Drug Delivery

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ABSTRACT

The nasal drug delivery is an alternative route for most of the CNS active agents because nasal mucosa is one of the most permeable and highly vascularized site for drug administration. This ensuring rapid absorption and early onset of therapeutic action. In addition, it minimizes the lag time associated with oral drug delivery and is noninvasive. This unlike intravenous drug delivery permits, self medication increases comfort to the patient and ensures compliance. Fluoxetine Hydrochloride (a selective serotonin reuptake inhibitor) loaded solid lipid nanoparticles ware prepared by microemulsion followed by ultrasonication method to improve the drug delivery. Glyceryl mono stearate and Stearic acid were selected as lipids for solid lipid nanoparticles preparation, acetone and ethanol as co-solvents and Tween 80 was used as surfactant. The FTIR spectra revealed no interaction between Fluoxetine Hydrochloride and lipids and pH of the formulations was found to be between 4.66 to 7.83. The entrapment efficiency and the particle size of optimized formulation F4 was found to be 76.66% and 66.72nm respectively. Shape and surface morphology was determined by TEM indicated spherical form of solid lipid nanoparticles. The optimized formulation F4 showed drug release of 97.20% in 24 hrs. Release kinetic study showed that the optimized formulation followed zero order diffusion controlled and non-fickian release mechanism. The permeation of optimized formulation (F4) was found to be two times more as compare to pure drug. On the basis of results it was concluded that Fluoxetine HCl loaded Solid lipid nanoparticles are potentially useful drug delivery methodfor improving the penetration through nasal route.

Keywords: Nasal route, Solid lipid nanoparticles, Fluoxetine HCl, Microemulsion, Glyceryl mono stearate, Stearic acid.

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