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Preparation and evaluation of self nanoemulsifying drug delivery system of Itraconazole

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Abstract

The present investigation was targeted to develop a self-nanoemulsifying drug delivery system (SNEDDS) for oral bioavailability enhancement of BCS II antifungal drug Itraconazole. SNEDDS of Itraconazole were developed using NMP as oil, Labrasol as surfactant and Transcutol as co-surfactant. After screening of five oils, four surfactants and four co-surfactants, the final ingredients were selected based on high solubility of Itraconazole. Ternary phase diagrams were constructed, using Triplot V4 software, to optimize the concentrations of excepients. All the formulations exhibited emulsification time as less than one minute. Thermodynamic stability studies were satisfactory. Robustness to dilution did not exhibit phase separation and drug precipitation. The *invitro* release profile showed a significant increased rate of dissolution, when compared with the pure drug. Among 41 formulations, 6 formulations showed more than 85% of drug release and were considered superior and subjected to droplet size analysis and zeta potential measurement. Droplet size ranged from 80 nm to 613 nm. The nano size was obtained for three formulations. The zeta-potential results indicated the range -6 to -30 mV. Based on all evaluation tests, formulation T26 was chosen as the best, which gave the dissolution of 94% in 120 minutes. The pharmacokinetic study in rats for the optimized formulation was performed and compared to the pure drug. SNEDDS formulation has significantly increased the absorption rate when compared to the pure drug. Thus, this self-nanoemulsifying drug delivery system should be an effective oral dosage form for improving oral bioavailability of lipophilic drug Itraconazole.

Biography

Trapti Saxena is working as Sr. Asst. Prof in Andhra Pradesh 1st NBA Accredited pharmacy college. She has supervised 5 project students for post graduate research work in Novel Drug Delivery Systems. She has 2 publications to her account. Apart from 9 years of academic experience, she has 5 years of research experience.