Formulation and Evaluation of Oral Solid Self Micro-emulsion of Anti-psychotic Drug

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Abstract

The aim of the present investigation was to develop a Solid self-microemulsifying drug delivery system(S-SMEDDS) to enhance solubility and dissolution rate of Quetiapine Fumarate. The solubility of Quetiapine Fumarate was checked in different oils, surfactants and cosurfactants and ternary phase diagrams were constructed to evaluate the microemulsion domain. Final formulation for SMEDDS containing 2.5% Capmul CMC EP, 50% Cremophore EL & Tween 20 and 47.5% water were optimized by 3^2 factorial design and response surface modelling. SMEDDS were characterized for % Transmittance, mean globule size, zeta potential, and % Cummulative drug release. The optimized microemulsion was further evaluated for % transmittance, dilutability, pH, viscosity, conductivity, drug content and stability study. Diffusion rate of Quetiapine Fumarate was measured by *in-vitro* Dissolution method by USP type II apparatuse using phosphate buffer (PBS) pH 6.8 as diffusion media. Based on characterization and *in-vitro* release results optimize batch was selected. Solid SMEDDS were prepared using colloidal silicon dioxide (Aerosil 200) and microcrystalline cellulose (Avicel PH101) to adsorb the optimal liquid SMEDDS.

S-SMEDDS were evaluated for powder characteristics and dissolution profile. The *in-vitro* release of S-SMEDDS, SMEDDS and marketed tablet formulation were compared. The globule size, zeta potential and % Cumulative drug release of optimal SMEDDS were found to be 11.86nm, -11.67 mv and 96.64% respectively. The quetiapine Fumarate S-SMEDDS showed maximum drug release 97.87% in 30 min compare to liquid-SMEDDS and marketed formulation.

Key words: Self micro emulsifying drug delivery system, Solid SMEDDS, Quetiapine Fumarate, Schizophrenia.