

# Spray dried self-nanoemulsifying drug delivery systems for sertraline HCl pharmacokinetic study in healthy volunteers

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## Abstract

**Purpose:** The aim of this study is to improve low oral bioavailability of sertraline HCl by formulation and characterization of solid self-nanoemulsifying drug delivery system [SNEDDS] using spray drying technique.

**Methods:** Solubility of sertraline HCl in different vehicles was determined, and ternary phase diagrams were constructed. Various formulations were prepared and characterized by morphological characterization, differential scanning calorimetry and droplet size analysis. The formulations were evaluated for in vitro release profile in comparison to the marketed product. In vivo study was performed on healthy human volunteers for pharmacokinetic analysis of the optimized formulations.

**Results:** In vitro release data showed significant improvement of dissolution rate of sertraline HCl in form of liquid SNEDDS compared to the plain drug. Optimized liquid SNEDDS were chosen for the preparation of solid SNEDDS by spray drying technique. High dissolution efficiency values of solid SNEDDS indicated the increase in dissolution characteristics of sertraline HCl in solid SNEDDS. F6 showed high values for AUC [0-72 h], AUC [0-∞] and AUMC [0-72 h].

**Conclusion:** The prepared formulation reveals the potentiality of incorporating sertraline HCl in a SNEDDS formulation to improve the biological performance of the drug.

*International Journal of Pharmaceutical Sciences and Developmental Research*  
2018, June