Solubility and Dissolution Enhancement of Tadalafil Using Self-Nanoemulsifying Drug Delivery System

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Abstract:

The aim of this study was to develop and evaluate self-nanoemulsifying drug delivery system (SNEDDS) of tadalafil (TDL) in order to enhance its aqueous solubility and dissolution rate. TDL SNEDDS were developed by aqueous phase titration method via construction of pseudo-ternary phase diagrams. The formulations which passed thermodynamic stability and self-nanoemulsification tests were further characterized in terms of droplet size, viscosity, % transmittance and drug content. Selected SNEDDS and drug suspension were subjected to in vitro drug release studies via dialysis membrane in phosphate buffer (pH 6.8). In vitro drug release studies showed 96.6% release of TDL from optimized SNEDDS F5 as compared to only 12.4% from drug suspension after 24 h of study. The results of solubility studies showed 1434 folds enhancement in TDL solubility from optimized SNEDDS F5 as compared to its aqueous solubility. Overall, these results indicated that developed SNEDDS could be successfully used to enhance solubility and dissolution rate of poorly soluble drugs such as TDL.

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