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Design, formulation and evaluation of self nano emulsifying drug delivery system for nisoldipine

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Abstract

The aim of the present work was to formulate and evaluate the Nisoldipine as Self Nano Emulsifying Drug Delivery System (SNEDDS). Nisoldipine, a calcium channel blocker is used in the treatment of hypertension. Nisoldipine belongs to BCS Class II drug which is poorly soluble in water and have very less bioavailability (5%). SNEDDS is an isotropic mixture of oils, surfactants, and co-surfactant or co solvents, which on dilution with water forms o/w emulsion. Nisoldipine SNEDDS was designed to improve the solubility and bioavailability. Solubility study of Nisoldipine was performed with various oils, surfactant and co-surfactant. In that, Acrysol L135 (53 mg/ml), Cinnamon oil (53 mg/ml), Capmul MCM (30mg/ml), PEG 400 (30mg/ml, Tween 80 (27mg/ml) has shown the highest solubility. Various compositions Acrysol L135, Capmul MCM, PEG were used to develop ternary phase diagram. Formulations AC 2, AC 15, AC 14 and AC 19 showed better self emulsifying region. Dilution studies of these formulations with different buffers were performed; the selected formulations showed no precipitation and turbidity. Droplet size of selected formulations was less than 200nm. In vitro results revealed formulations AC 14 and AC 19 have 55% and 59% drug release respectively when compared with pure drug in solution (29%) for 24 hours. The study concludes that the prepared SNEDDS formulation of Nisoldipine have better in vitro release profile.

Biography

Balakumar Krishnamoorthy, Assistant Professor, PSG College of Pharmacy, Coimbatore has completed under graduate and post graduate from The TN Dr. M.G.R. Medical University, Chennai. His area of specialization in post graduation is Pharmaceutics. His research areas are Self Nano Emulsifying Drug Delivery System, Nanoparticulate drug delivery and bioavailability improvement techniques for BCS Class II/IV drugs. He has nearly 2 years of experience in Novel Drug Delivery System, Formulation Development in Shasun Chemicals and Drugs Limited and he published 5 research papers and 2 review in peer reviewed international journals.