

Pharmacokinetic comparison of loratadin self-emulsifying drug delivery system with its conventional oral solution in rat

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Background and Aims: Preparation of self-emulsifying drug- delivery systems (SEDDS) is among the strategies to overcome low bioavailability of drugs with poor aqueous solubility. The aim of the current study is to compare the plasma concentration profile of a SEDDS of loratadine with its commercially available oral solution.

Methods: Loratadine(4 mg/kg) in the form of a SEDDS(composed of Span 20 , Capriol, paraffin, Transcutol and loratadine) and its conventional oral solution was administered in two separate groups of wistar rats(n=13) after an over-night fasting. Blood samples (0.5 ml) were collected at 0 (as a control), 0.25, 0.5, 1, 2, 3, 4, 8, 12 hours post drug administration. Loratadine blood concentrations were determined by high-performance liquid chromatography with fluorescence detection (excitation at 290 and emission at 460 nm). Chromatography was carried out using a C8 column and a mixture of methanol:acetonitrile:0.05 M KH₂PO₄ (3:30:67, v/v/v, pH 2.0) delivered at a flow rate of 1.2 ml/min. Plasma samples(containing propranolol as internal standard) were prepared by liquid-liquid extraction of loratadine with n-butyl alcohol/n-hexane after alkalization by NaOH and back-extraction into water with perchloric acid.

Results: Dose-normalized loratadine plasma concentrations following administration of SEDDS showed an average of 4-fold increase for all sampling -time points in comparison to those of oral solution. Calculated AUC (0-12) based on Naïve average of plasma concentration data was three-times greater in rat receiving SEDDS. However, due to large inter-individual variability in all plasma concentrations (25-192% for oral solution and 69-749% for SEDDS) all these differences could not be considered statistically significant.

Conclusions: Results indicated that SEDDS could lead to an increase in loratadine bioavailability, however, this formulation showed very large inter-individual variability in plasma concentration- time profile of the drug as compared to its conventional oral solution.

Keywords: Loratadine; Drug delivery; Self emulsifying; Pharmacokinetics; Rat