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Preparation and *in vivo* evaluation of artemisinin-dextrin freeze dried powders

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Artemisinin (ART) is an oral antimalarial agent with poor aqueous solubility and low oral bioavailability. The present study describes the preparation of artemisinin freeze dried powder using dextrin at different ratios, designed to enhance the solubility of artemisinin and hence oral bioavailability. The resultant products were evaluated using relative bioavailability studies which were conducted in Sprague-Dawely rats using the optimized formulation against the reference suspension. The effect of incorporation of different co-carriers (citric acid or mannitol) to artemisinin-dextrin freeze dried powder at different ratio was evaluated. There was a significant increase in the solubility and dissolution rate of artemisinin was obtained with the artemisinin-dextrin-citric acid freeze dried powder at a ratio of 1:3:1. There was statistically significant increase in the oral bioavailability of freeze dried artemisinin-dextrin-citric acid mixture compared to reference suspension. The rate and extent of absorption was enhanced by 3.4 folds. In conclusion freeze dried product of artemisinin was able to increase solubility, dissolution and therefore the oral bioavailability.

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Bioavailability enhancement of sulpiride from a gastro retentive drug delivery system in rabbits

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The present study was aimed to develop, validate a simple reversed-phase high performance liquid chromatographic method for determination of sulpiride in plasma and also to evaluate *in vivo* performance of the optimized gastroretentive formulation in comparison with a non-gastroretentive reference product (Dogmatil®) using rabbits as an animal model. The HPLC system was operated at an excitation and emission wavelengths of 300 nm and 365 nm, respectively with the gain was set at 4 and sensitivity at medium. The mobile phase was consisted of 0.01 M phosphoric acid, acetonitrile and methanol (84:12:4, v/v) with addition of Triethylamine (0.15%v/v). The mobile phase pH was adjusted to 6 by using glacial acetic acid. The mobile phase was isocratically pumped at a flow rate of 1 mL/min. The analytical column Luna C18 (5 µm, 250 x 4.6 mm ID, Phenomenex, USA) fitted with a refillable guard column (Upchurch Scientific, Oak Harbour, WA, USA) packed with Perisorb RP-18 (30-40 µm, pellicular) was used for chromatographic separation. The mobile phase was filtered under vacuum through 0.45 µm nylon membrane filter (Whatman International, England) and degassed before used. The calibration curve was linear in the range of 15 to 4000 ng/ml with correlation coefficient (r) of 0.9999 (±0.0001). The intra-day accuracy ranged from -4.59% to 12.91% with a precision from 1.42% to 6.79%. The inter-day accuracy ranged from -1.86% to 6.29% with a precision from 4.21% to 13.91%. The extraction recovery values were found to be 95.99 ± 9.44%, 96.12 ± 11.94% and 93.49 ± 5.13%, with precision of 9.84%, 12.42% and 5.49% respectively. The mean recovery for internal standard (metoclopramide) was 90.28 ± 3.95%. The values of accuracy, precision and recovery obtained were within the acceptable limits as proposed by USFDA Bioanalytical Guidelines. For *in vivo* pharmacokinetics study a balanced two-way crossover design was used using 6 rabbits. The optimized formulation had higher Tmax, andAUC0-∞ values but lower C_{max} value than non-gastroretentive reference product (Dogmatil® capsule). The bioavailability of sulpiride in the optimized gastroretentive dosage form was 2.20 times higher than the non-gastroretentive reference product (Dogmatil® capsule). In addition, the amount of drug released in vitro was correlated with the amount of drug absorbed in vivo.

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