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TITLE

EVALUATING EFFECT OF SELF-MICROEMULSIFYING DRUG DELIVERY FORMULATION AND CONCOMITANT ADMINISTRATION OF PIPERINE ON BIOAVAILABILITY OF SULPIRIDE, A P-GP SUBSTRATE AND BCS CLASS IV DRUG

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The aim of the study was to evaluate the effects of self-microemulsifying drug delivery system (SMEDDS) and concomitant administration of piperine on bioavailability of sulpiride, a P-gp substrate and BCS Class IV drug. The bioavailability study was conducted using 24 male New Zealand white rabbits weighing between 3.0-3.5 kg, according to a parallel study design. The rabbits were divided into four groups and administered four different formulations, Dogmatil®, SMEDDS, piperine + Dogmatil® and piperine + SMEDDS. The SMEDDS formulation was comprised of 17.71% oleic acid, 55.14% Tween 80 and 27.15% propylene glycol. Piperine at a dose equivalent to 7 mg/ kg body weight, while SMEDDS and Dogmatil® at a dose equivalent to 17 mg/ kg body weight, were administered. The SMEDDS formulation exhibited 2.18 folds higher bioavailability than Dogmatil®. The increase in bioavailability might be attributed to enhancement in the dissolution rate, permeability and P-gp inhibition. Concomitant administration of piperine increased the bioavailability of Dogmatil® to 1.64 folds. The increase in the bioavailability could be attributed to the modulation of permeability characteristics of the intestine, increase in blood flow to the splanchinic organs, P-gp inhibition and increase in the gastric transit time. When SMEDDS formulation was administered concomitant with piperine, the bioavailability of Dogmatil® increased further to 2.80 folds. The increase in the bioavailability might be attributed to enhancement in the dissolution rate, the synergistic effect of Tween 80 and piperine in increasing the permeability and inhibition of P-gp. In conclusion, concomitant administration of piperine further enhanced the bioavailability of SMEDDS formulation of sulpiride.