

Omeprazole from determination to healthy subjects

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Background and Aims: To develop a simple and rapid HPLC method for measuring of omeprazole concentrations in human plasma and evaluate pharmacokinetic parameters of omeprazole after single oral administration to Iranian healthy subjects.

Methods: Following a single step liquid-liquid extraction omeprazole along with an internal standard were separated using an isocratic mobile phase of phosphate buffer (10 mM)/acetonitrile (53/47, v/v adjusted pH to 7.3 with triethylamine) at flow rate of 1 mL/min on reverse phase TRACER EXCEL 120 ODS-A column at room temperature. 30 healthy male subjects, aged 24-31 years, weighing 60-98 kg completed the study. Plasma concentrations of omeprazole were measured over a 12 h period after administration of a single oral dose of 20mg omeprazole (Losec®). The pharmacokinetic parameters were calculated from the plasma concentration-time profiles. Liquid chromatography coupled to tandem mass spectrometry (LC-MS/MS) was used to quantify 5-Hydroxyomeprazole.

Results: Total analytical run time for omeprazole was 6 min. The assays exhibited good linearity ($r^2 > 0.99$) in range of 20 to 2500 ng/mL. The recovery of the method was greater than 80% and lower limit of quantification (LLOQ) was 20 ng/mL. Coefficient of variation and error at all of the intra-day and inter-day assessment were less than 9.2%. The mean for AUC_{0-∞}, C_{max}, t_{1/2} and CL/F were 987.3 ± 643.7 ngh/ml, 386.2 ± 138.4 ng/ml, 0.9 ± 0.4 h and 0.32 ± 0.12 L/h/Kg (mean \pm SD), respectively. In general, most subjects showed normal distribution. Only one subject did show very high AUC compared with the corresponding mean AUC level and different metabolic profile.

Conclusions: The results indicated that this method is sensitive and reproducible enough to be used in pharmacokinetic studies. Pharmacokinetic results are consistent with previous literature that showed existence of interindividual variability in omeprazole pharmacokinetics, even within a single ethnic group.

Keywords: Omeprazole; HPLC; Pharmacokinetics