

Phenotype-genotype analysis of CYP2C19 in Iranian population

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Background and Aims: Omeprazole is metabolized to 5-hydroxyomeprazole by the hepatic cytochrome P450 (CYP) 2C19 enzyme. The defective mutations of CYP2C19 cause genetic polymorphisms responsible for the presence of poor metabolizers (PMs), intermediate metabolizers (IMs) and extensive metabolizers (EMs). In several studies the plasma concentration ratio of omeprazole and hydroxyomeprazole, is used as an index for determination of CYP2C19 activity. The aim of present study is to evaluate genotype and phenotype status of CYP2C19 in Iranian population, in order to contribute to the use of appropriate strategies of drug therapy for this population.

Methods: 100 subjects were genotyped using polymerase chain reaction-restriction fragment length polymorphism PCR-RFLP technique. For phenotyping process each subject received a single dose of omeprazole. Blood samples were collected 3 hours after ingestion of medicine and hydroxylation index of omeprazole was determined by Reversed Phase HPLC.

Results: The averages of Hydroxylation index [$\log(\text{omeprazole}/\text{hydroxyomeprazole})$] for the three genotypes were statistically different. Hydroxylation index of omeprazole was lowest in the EMs, and highest in the PMs. Based on our data, there was no difference between frequency of CYP2C19 allelic variants in our study and other evaluated Caucasians ($p > 0.05$).

Conclusions: Since pharmacogenetic allows the introduction of personalized pharmacotherapy, according to individual genetic data, the results of this study will be useful for drug dosage recommendations in Iran.

Keywords: Polymorphism; Genotype; Phenotype