Genetic Polymorphism of Cytochrome P450 2D6*4 and 2D6*5 in an Adult Population Sample from Costa Rica

Chaverri-Fernández, José Miguel1*, Ortiz-Ureña, Angie1, Díaz-Madriz José Pablo1, Alvarado-Leitón, Jeimy1, García-Chaves, Sergio1, Garro-Zamora, Luis David1, Arias-Echandi and María Laura2

1Pharmaceutical Research Institute, Pharmacy Faculty, Universidad de Costa Rica
2Tropical Disease Research Center and Microbiology Faculty, Universidad de Costa Rica
3Pharmacy Department, Hospital Clínica Bíblica, Costa Rica

*Telephone: 2511 8643, E-mail: maria.ariasechandi@ucr.ac.cr

KEYWORDS Cytochrome-P450. Drug Metabolism. Pharmacogenetics. Single Nucleotide Polymorphism

ABSTRACT Currently, there is a defined group of drugs, previously established by the Food and Drug Administration (FDA), that requires pharmacogenomic tests, due to possible polymorphisms in the cytochromes that metabolizes them, leading to a potential modification of their pharmacokinetic and/or pharmacodynamic properties, and therefore their dosage. The main objective of this study was to determine the frequency of two single-nucleotide polymorphism (SNP) for CYP2D6 cytochrome, related to a poor metabolizer phenotype: CYP2D6*4 and CYP2D6*5 in a group of adults from Costa Rica. CYP2D6*4 allele was determined by PCR RFLP methodology and CYP2D6*5 allele by multiplex PCR in 389 adult blood samples from Costa Rica. The allelic frequency determined for CYP2D6*4 was of 12.2 percent, and of 2.8 percent for CYP2D6*5. There were 23 subjects with a homozygote polymorphic genotype (4*/4*) and 3 with a double heterozygote mutation (wt/4* and wt/5*); that corresponds to a 6.7 percent of the sample. The relevance of this finding is due to the fact that a slower metabolism for selective substrates has been demonstrated in subjects from Costa Rican origin, due to SNP in alleles for CYP2D6; nevertheless, other CYP2D6 polymorphisms implied in this phenotype should be analyzed, in order to give a definitive characterization.