

Pharmacogenetic testing in population of South Ural

V.O. Barysheva* and G.G. Ketova

South Ural State Medical University, Scientific-educational Center Clinical Pharmacology, Chelyabinsk, Russia

*Corresponding author. E-mail: valeriya.bar@mail.ru

BACKGROUND: Drug resistance is a phenomenon that has received serious attention in recent years in everyday medical practice. This may also be described as responsiveness or non-responsiveness to drugs, as patients respond partially to medical treatment or have no response at all [1]. The non-responsiveness to clopidogrel in cardiac patients of different populations is due to genetic variations in the cytochrome P450 (CYP) gene [2]. Carriers of at least one ‘poor metabolizer allele’ of CYP2C19 (either *2 or *3) have lower levels of the active metabolite of clopidogrel and have reduced platelet inhibition [3]. Furthermore, the significant inter-ethnic variability in the allelic frequencies of CYP2C19*2 has been associated with differential clopidogrel resistance [4]. Such mutations in this variant allele are responsible for the inability of the CYP enzyme to convert clopidogrel into its active metabolite, which may result in the increased risk of death, heart attack or stroke among patients who have undergone percutaneous coronary intervention (PCI) [5]. South Ural is a multinational region, a subject of the Russian Federation, where genetic variations have not been studied fully yet.

OBJECTIVE: To examine prevalence of mutant alleles in population of South Ural.

METHODS: We conducted pharmacogenetic testing for specific single nucleotide polymorphisms in 54 patients. The present research was conducted in the alleles CYP2C19*2 and CYP2C19*3. The data were processed using the program SPSS Statistics.

RESULTS: The mean age of patients was 58, 4 years (from 26 to 79 years). Among all patients 59.3% were male, 40.7% of female patients.

Among the studied patients in allele CYP2C19*2, the “wild” type GG was detected in 75,9% of patients, GA type in 22.2% and AA variant was detected in 1.9% of all patients. Allele CYP2C19*3 is often found among alleles with reduced function and also associated with resistance to clopidogrel. Functional drug response is observed in patients with type GG. All of the studied patients were carriers of this type. According to literature data the frequency of genotypes associated with resistance to clopidogrel in the Russian population is 11.4%, which is comparable with European ethnic groups [6].

CONCLUSIONS: It was revealed that 75,9% of patients were sensitive to clopidogrel, and for them this drug in its standard dosage will be effective, and 24,1% of patients were not sensitive, therefore, they would require replacement of clopidogrel with another drug.

Keywords: Clopidogrel, pharmacogenetic testing, CYP, single nucleotide polymorphism

Conflict of interest statement: None.

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