CYP2C19 gene polymorphism in children with drugs-resistant epilepsy in Ukraine

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Objective: The frequency with which drugs-resistant epilepsies occur is unchanged and reaches 30%. It is believed that isoenzymes of cytochrome P450 can significantly affect the metabolism, efficacy and safety of AEDs. The purpose of our study was to find out in children with drug-resistant epilepsy the frequency with which polymorphism of isoenzymes of cytochrome P450 - CYP2C19 occurs taking part in biotransformation of most AEDs.

Material and Methods: We analyzed the results of an examination of 83 patients (children and adolescents), 49 (61.54%) boys and 34 (38.46%) girls, aged 11 months to 18 years. Children suffer from severe, refractory to the treatment forms of epilepsy. Duration of the disease from 7month to 17 years. All children were given genetic research using the allelic method of a specific PCR with the subsequent visualization of the products of amplification in agarose gel.

Research Results: Among the examined patients, 33 (39.76%) appeared to be carriers of the CYP2C19* 2 (rs4244285) allele, associated with a slowdown in AED metabolism due to the synthesis of enzyme with reduced activity. In the examined group was not found CYP2C19* 3 (rs4986893) allele, that corresponds to the literature data on the absence of this type of polymorphism in the European population (Lewis DF, 2004). In 5 children (15.15%), the carriage of the CYP2C19* 2 allele was combined with other polymorphisms - CYP2C9 * 2, CYP2C * 3, CYP3A4 * 1B. Carrier of the allelic variant CYP2C19*2 among children with refractory to epilepsy treatment is very common, significantly higher than its frequency in the general Ukrainian ($p < 0.01$) and other European ($p < 0.05$) populations. According to our data, the heterozygous genotype CYP2C9 *1/*2 was found to be significantly more frequent than in the data of Russian and Turkish specialists. The presence of significant differences in the genotypes of children with epilepsy in Ukraine, Russia and Turkey can be explained by the characteristics of the patients who were included in the study.

Conclusions: The carrier of allele variant CYP2C19*2 among children with refractory to the treatment epilepsy is very common, reaches 39,76%, which is more than twice its frequency in the total Ukrainian ($p<0.01$), in other European ($p<0.05$) populations. The presence of "slow" alleles, in particular of CYP2C19*2, in children with epilepsy affects the effectiveness and safety of therapy, contributing to the formation of resistant forms of the disease.

Biography

Yevhen Tantsura is working in the Department of General practice-Family medicine at the V.N. Karazin National University, Kharkiv, Ukraine. Has his expertise in study of pharmacology and pharmacogenetics.

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