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On the role of genetic factors in the development of preeclampsia

Batlutskaya I.V., Abramova M.Yu.*
BELGOROD State National Research University, Belgorod, Russia
** abramova_myu@bsu.edu.ru*

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Introduction: Preeclampsia (PE) is one of the most severe complications of pregnancy and, traditionally, occupies one of the leading places among the causes of maternal mortality [1]. There are many theories about the causes of this complication of pregnancy, but a consensus on this issue has not yet been formed. The only indisputable fact is that PE, like most other pathologies, refers to multifactorial diseases, the development of which is due to the interaction of environmental and genetic factors. According to the data of foreign and domestic literature, the genetic component in the formation of this complication of gestation is more than 50 % [2]. However, despite the huge array of studies conducted, the results obtained are often ambiguous and vary depending on the ethno-territorial characteristics of the groups studied.
Goal: To study the associations of the rs2681472 polymorphism of the *ATP2B1* gene with the development of preeclampsia in the population of the Central Black Earth Region of the Russian Federation.
Materials and Methods: The samples for this study included 236 women with PE (the mean ± SD age of 26.97 ± 5.38 years) and 97 individuals with a physiological course of gestation (the mean ± SD age of 26.49 ± 5.48 years) of Russian nationality, residents of the Central Black Earth Region of the Russian Federation without any kinship, and who gave voluntary consent to participate in the study. The samples were formed on the basis of the perinatal center of the Saint Joasaph Belgorod Regional Clinical Hospital. The venous blood of all women served as the material for the study. DNA was extracted from whole blood by phenol-chloroform method. Genotyping of the polymorphic variant rs2681472 of the *ATP2B1* gene performed by PCR DNA synthesis on a CFX-96 Real-Time System (Bio-Rad, USA) using standard oligonucleotide primers and probes polymorphism analysis by allele discrimination. The statistical data were analyzed using STATISTICA (V. 6.0.) software for Windows.
Results and Discussion: When conducting a population-genetic analysis of the observed frequency distribution of alleles and genotypes according to the polymorphic marker under consideration, it showed its compliance with the theoretically expected distribution according to the Hardy-Weinberg equilibrium. The following frequency of genotypes and alleles of the polymorphic locus rs2681472 of the ATP2B1 gene established in a sample of women with PE: GG — 2.30 %, AG — 25.74 %, AA – 71.96 %, the frequency A and G alleles was reported to be 84.83 and 15.17 % respectively. In the control group, the frequency was also calculated: homozygote GG – 2.89 %, heterozygote AG — 28.23 % and homozygote AA — 68.87 %. The frequency of A and G alleles in the control group respectively, was reported to be 82.99 % and 17.01 %.

When conducting a comparative analysis of the frequencies of alleles and genotypes rs2681472 of the *ATP2B1* gene, there were no statistically significant differences between the studied samples ($p > 0.05$).

Conclusions: The polymorphic locus rs2681472 of the *ATP2B1* gene is not associated with the development of preeclampsia in the population of the Central Black Earth Region of the Russian Federation.

References

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