

THE ASSOCIATION ANALYSIS OF LIPID METABOLISM GENE POLYMORPHISMS WITH BMI, WAIST CIRCUMFERENCE AND BLOOD LIPODOGRAMM PARAMETERS IN WOMEN

O.S. Glotov^{1,2,3}, I.V. Tarkovskaia^{1,3}, E.U. Ditkina³, E. S. Vashukova^{1,2}, A.S. Glotov^{1,2}, T.E. Ivashchenko^{1,2}

¹St-Petersburg State University, Saint-Petersburg, Russian Federation

²FSBI «The D.O.Ott Research Institute of Obstetrics and Gynecology» NWB RAMS, Saint-Petersburg, Russian Federation

³Co.Ltd «BioGlot», Saint-Petersburg, Russian Federation

ABSTRACT

Using the PCR-RFLP method we have studied polymorphism of 36 genes involved in lipid metabolism in 212 women, residents of St. Petersburg, aged 18 to 77. We found an association of polymorphisms in several candidate genes with body mass index (BMI), waist circumference (WC) and total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C) and very low-density lipoprotein cholesterol (VLDL-C) levels. We proposed a logistic regression models for a primary assessment of these parameters in women based on corresponding genetic markers tests. We estimated the efficiency of these models on the basis of the adjusted determination coefficient (adjusted R^2). The highest rates of adjusted R^2 are received for the VLDL-C parameter ($R^2=0.101$) with the smallest forecasting error (± 0.21 mmol/litre) in comparison with an forecasting error of the BMI (± 4.1 kg/m²), WC (± 10.33 cm), TC (± 0.95 mmol/litre) and the LDL-C levels (± 0.83 mmol/litre). After the division of the group into premenopausal and postmenopausal women it emerged that adjusted R^2 was higher in the group of postmenopausal women in comparison with the group of premenopausal women for all studied parameters: BMI ($R^2=0.44$ and $R^2=0.043$), WC ($R^2=0.38$ and $R^2=0.098$), TC ($R^2=0.32$ and $R^2=0.143$), LDL-C ($R^2=0.33$ $R^2=0.112$), VLDL-C ($R^2=0.43$ and $R^2=0.043$), respectively. Our results apparently indicate higher genetic determinacy of the VLDL-C in comparison with other parameters, and also indicate that after the menopause genes make more contribution to levels of studied parameters than environmental factors. [Complimentarily](#), we performed Kendall's correlation analysis, which partially confirmed the association found with the linear regression model.

Keywords: gene polymorphism, lipid metabolism, TC, LDL-C, VLDL-C, candidate genes, BMI, WC waist circumference, correlation, regression