

Міністерство освіти та науки, молоді та спорту України
Міністерство охорони здоров'я
Сумський державний університет
Медичний інституту



АКТУАЛЬНІ ПИТАННЯ ТЕОРЕТИЧНОЇ ТА ПРАКТИЧНОЇ МЕДИЦИНИ

Topical Issues of Clinical and Theoretical
Medicine

Збірник тез доповідей
III Міжнародної науково-практичної конференції
Студентів та молодих вчених
(Суми, 23-24 квітня 2015 року)

Суми
Сумський державний університет
2015

FREQUENCIES OF VKORC1 G3730A GENETIC VARIANTS IN ISCHEMIC ATHEROTHROMBOTIC STROKE PATIENTS

Garbuzova E.A., Dubovyk Ye.I., Ataman O.V.

Sumy State University, Physiology and Pathophysiology Department

Background. Vitamin K epoxide reductase (VKOR) is an integral membrane protein that catalyzes the reduction of vitamin K 2,3-epoxide and vitamin K to vitamin K hydroquinone, a cofactor required for the G-glutamyl carboxylation reaction. VKOR is highly sensitive to inhibition by warfarin, the most commonly prescribed oral anticoagulant. A lifelong decreased activity of the VKOR enzyme, however, might impair MGP activity and by this increase the risk of vascular calcification. The VKORC1 gene is located on the short arm of chromosome 16 (chromosomal location: 16p11.2). Polymorphisms in the VKORC1 could affect blood coagulation and other vitamin K-dependent proteins, such as osteocalcin, bone Gla protein, matrix Gla protein.

Purpose. Study of frequencies of VKORC1 G3730A genetic variants in ischemic atherothrombotic stroke (IAS) patients.

Materials and Methods. The study was conducted using venous blood of 170 patients with IAS (57,6% men and 42,4% women), the average age of $64,7 \pm 0,73$ years. The control group consisted of 124 healthy donors, and the absence of cardiovascular diseases was confirmed through history, electrocardiogram data and arterial pressure measurements. DNA was isolated from it using a set of "Isogene" (Russia). The polymorphism G3730A (rs7294) was analyzed by amplification of a 500-bp sequence with the use of the following primers: sense – 5'-GTCCCTAGAAGGCCCTAGATGT-3', antisense – 5'-GTGTGGCACAATTTGGTCCATT-3'. The resultant polymerase chain reaction products were digested with *BseNI* (Thermo Scientific, USA), which yielded 2 DNA fragments of 260 and 240 bp for the G allele on 2,5% agarose gel and only 1 band (500 bp) for the A allele. The results were worked out statistically using the official average of SPSS Statistics 17.0. For this purpose, reliability of differences was determined using χ^2 - test. The value of $P < 0.05$ was considered reliable.

Results. Genotyping of the patients with IAS and comparing the results obtained with those of restriction analysis in the control group allowed to set that frequency of definite variants of this gene is statistically insignificant in G3730A polymorphism. It has been found that the ratio of homozygotes by the major allele, heterozygotes and homozygotes by the minor alleles in G3730A polymorphism constituted in patients with IAS: 31,8%, 50,0%, 18,2%; and in the control group it was 36,3%, 50,8%, 12,9% ($P = 0,423$, $\chi^2 = 1,721$).

Conclusions. No association has been found between the G3730A polymorphism of VKORC1 gene and ischemic atherothrombotic stroke in the patients from the northeastern region of Ukraine.

ASSOCIATION *TaqI* POLYMORPHISM OF VDR GENE IN SMOKERS AND NON-SMOKERS, AMONG PATIENTS WITH ISCHEMIC STROKE

Obukhova O.A.

Sumy State University, Physiology and Pathophysiology Department

Study by WHO is shown that traditional approaches in the treatment of ischemic stroke are ineffective and lead to significant economic costs. The problem of low efficiency of health care activities is related to the absence of their etiological orientation due to insufficient understanding of the major mechanisms of formation of cerebrovascular disorders. It is projected that until 2030 morbidity stroke will increase by 25%, due to the aging of the world population and increasing prevalence in the population of brain stroke risk factors like hypertension, heart disease, diabetes, physical inactivity, obesity, smoking, and others.

The aim of our study was to analyze the association of *TaqI* polymorphism of *VDR* gene in smokers and non-smokers patients with atherothrombotic ischemic stroke.

Venous blood of 170 patients with atherothrombotic ischemic stroke (AIS) and 124 healthy individuals (control group) was used for genotyping. Pathogenetic variants of stroke was determined

according to the criteria TOAST, based on anamnesis and clinical features of the disease, dopplerography ultrasound data of main arteries of the head, and ECG. Polymorphism *TaqI* of gene *VDR* was examined with PCR-RFLP methodology.

The distribution of genotypes for *TaqI* polymorphic variant of *VDR* gene in smokers and non-smokers was as follows. In the control group were found people, who do not smoke, with genotype T/T – 43.0%, with genotype T/t – 48.4%, with genotype t/t – 8.6%, and those who smoke, respectively 45.1%, 35.5% and 19.4%. The comparison of the data indicates a lack of statistically significant differences in the distribution of genotypes of *TaqI* polymorphic variant between persons who are smokers and non-smokers in the control group ($\chi^2=3,263$, $P=0,196$). Among patients with AIS persons, non-smokers, with genotype T/T was 42.5% with genotype T/t – 46.7%, with genotype t/t – 10.8%, and smokers – 34.0%, 52.0% and 14.0% respectively. Statistically significant differences in the distribution of SNP between the smokers and smokers with IAI is not found ($\chi^2=1,146$, $P=0,564$).

In both groups, the main and control were not revealed association between genotype and patients habit to the smoking.

THE DISTRIBUTION OF GENOTYPES FOR THE A69314G POLYMORPHISM TNAP GENE IN THE CONTROL GROUP AND IN PATIENTS WITH ACUTE CORONARY SYNDROME

Rozumenko I.A., Forkert I.A., Garbuzova V.Yu.

Sumy State University, Physiology and Pathophysiology Department

Introduction. Tissue non-specific alkaline phosphatase (TNAP) promotes mineralization by hydrolysis inorganic phosphate (Pi) of inorganic pyrophosphate (PPi). Nowadays, there are more than 3500 single-nucleotide polymorphisms of TNAP gene. Most researched such polymorphism appeared in connection with the TNAP gene mechanisms of calcification of the vascular wall, leading to the development of acute coronary syndrome.

The purpose of the study. To investigate the distribution of genotypes for the A69314G polymorphism gene TNAP in healthy individuals and in patients with acute coronary syndrome (ACS).

Materials and methods. Venous blood of 118 ACS patients were genotyped for the polymorphism by PCR. All statistical analyses were performed using the Statistical Package for Social Science program (SPSS for Windows, version 17.0). The χ^2 -test was used for comparison of the allele and genotype frequencies between different study subgroups. Differences were considered statistically significant with a P-value < 0.05.

Discussion of results. From the analysis of the results of individual genotype frequencies for the A69314G polymorphism gene TNAP in the control group and in patients with ACS can be seen that in patients with ACS value homozygotes for the major allele (A/A), carriers of the minor allele (A/G+G/G) was 83,6% and 16,4%, while in the control group, the corresponding figures amounted to 69,5% and 30,5%. Differences in the distribution of different variants of genotype between patients with ACS and healthy patients go beyond statistical significance ($\chi^2 = 6,302$, $P = 0,012$).

Conclusions. There is a significant difference in the distribution of genotypes for the A69314G polymorphism gene TNAP between healthy and sick persons with ACS.