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ABSTRACTS

Pharmacological aspects of statin treatment

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Abstract

The review describes features pharmacodynamics and pharmacokinetics of different statins, considering side effects, effects on cytochrome P450, drug interactions, bioavailability. Special attention is given to rosuvastatin. The review describes how these parameters should be considered a practical physician.

Keywords: statin, pharmacokinetics, drug interactions, cytochrome P450, transporters.

Proprotein convertase subtilisin / kexin type 9 (PCSK9) + control the expression of low density lipoprotein receptor

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Abstract

New data became available during last decade about the regulation of expression of hepatic low density lipoprotein receptor (LDL-R) which supplies clearance of LDL particles from the blood. Proprotein convertase subtilisin kexin 9 (PCSK9) was identified and it has been shown that this molecule plays a key role in degradation of LDL-Rs. This leads to a lower uptake and further catabolism of circulating LDL, as result the concentration of LDL in the serum raises. Current review is devoted to the discovery of PCSK9, its role in LDL-R degradation, regulation of PCSK9 expression and to its physiological role.

Keywords: proprotein convertase subtilisin / kexin 9, receptor LDL, hyperlipidemia.

Dynamics of microcirculatory disorders in patients with atherosclerosis obliterans according to the degree of lower limb ischemia after reconstructive operations on trunk arteries

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Abstract

Purpose. To determine the dynamics of blood cells in the basins of the ischemic limb, depending on the degree of ischemic after restoration of blood flow in the limbs.

Results. The study of the ultrastructure of blood cells showed deformation of red blood cells, platelets, the formation of conglomerates of platelets and red blood cells to each other, which is the cause of thrombotic events in patients with critical ischemia.

Conclusions. The increase at the degree of ischemia observed growth changes the cell structure, which was accompanied by a sharp inhibition of their functions and the violation of the rheological properties of blood. All these factors determine the prognosis of the disease and treatment outcome.

Keywords: the surgical treatment of patients with obliterative atherosclerosis, morphofunctional state of cells.

Relationship of uric acid and lipid metabolism in patients with low and moderate risk

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Abstract

Purpose: To determine the relationship between the concentration of uric acid (UA) in serum with lipid metabolism and their dependence on the presence of the metabolic syndrome in patients with low and moderate risk.

Material: 600 people aged 30 65 years (women 445, 155 men) with low and moderate cardiovascular risk score without diseases associated with atherosclerosis and diabetes. The patients were divided into groups depending on: 1) the age and sex, and 2) the number of atherosclerotic plaque in the carotid arteries.

Methods: Biochemical tests - the concentration of uric acid in serum, lipid profile: total cholesterol, low density lipoprotein cholesterol (LDL-C), high density lipoprotein cholesterol (HDL-C), triglycerides (TG), apolipoprotein (apo A-1, apo B-100).

Results: Statistically significant correlation UA with triglycerides and HDL-C was found in all groups. There was no influence of metabolic syndrome on the relationship between UA and TG, UA and HDL-C, so presence of metabolic syndrome does not affect the correlation between the studied parameters.

Conclusion: In patients with low and moderate risk concentration of uric acid in serum significantly correlated with lipid profile, regardless of the presence or absence of metabolic syndrome.

Keywords: uric acid, metabolic syndrome, triglycerides, lipids, lipoproteins.

Assessment of genetically complex dependence on the apolipoprotein A-I, B, and C-III, E and lipoprotein (a) in patients with hypertriglyceridemia

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Abstract

Objective. The objective of the work was to evaluate importance of some genetic-related parameters determination such as serum apolipoproteins (apo) A-I, B, C-III, E, and Lp(a) in patients with hypertriglyceridemia (HTG) who were consulted by a lipidologist.

Patients and methods. The study group consisted of 96 patients (48 men and 48 women) from 17 to 70 years old, with serum triglycerides (TG) exceeding 2,3 mmol/l. Fasting plasma TG, cholesterol, apo A-I, B, C-III, E, and Lp(a) were measured. Lipid electrophoresis was also performed.

Results. We found the significant correlations of serum TG levels with apo E and C-III, and apo E with apo C-III in patients with HTG that points out the receptor defect of VLDL uptake by some cells that is one of some causes developing HTG. Apo B level was higher in patients with type IIb hyperlipidemia in comparison to types III, IV and V. As to apo A-I and Lp(a) levels, we have found no difference between patients with moderate and severe HTG. The elevated levels of serum apo E and C-III were determined in 68,8% and 76% patients, accordingly.

Conclusion. The evaluation of genetic-related parameters of serum apo C-III and apo E is an additional diagnostic tool for the identification of primary HTG patients.

Keywords: Hypertriglyceridemia, apolipoprotein C-III, apolipoprotein E, lipoprotein (a)

Locus 9p21.3 – genetic predictor of coronary atherosclerosis severity

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Abstract

The purpose of this study was to investigate association between 9p21.3 locus single nucleotide polymorphisms (SNP) and severity of coronary atheromatous burden. A total of 255 Caucasians (211 male, 44 female) with myocardial infarction age younger 65 old (mean 52,56±7,98 years) were recruited from 01.01.2009 to 30.06.2010. The study was approved by Ethic Committee of the KrasGMU. All participants were included in the study after written informed consent form. Genome DNA was extracted from leukocytes of venous blood using the phenol-chloroform extraction method. Two SNPs rs10757278 and rs1333049 (locus 9p21.3) were tested using real-time polymerase chain reaction (PCR) according to protocol (probes TaqMan, Applied Biosystems, 7900HT). The coronary angiograms were reviewed by independent angiographers who were blinded to the results of the genotype. The total number of lesions, Gensini scores and SYNTAX score were derived. For the first time in Russian population, genotype CC rs1333049 and genotype GG rs10757278 locus 9p21.3 demonstrated a direct strong association with severity of coronary atheromatous burden.

Keywords: myocardial infarction, single nucleotide polymorphisms, rs10757278, rs1333049, locus 9p21.3, atherosclerosis.

Age-related complications in patients follow reconstructive aortic and low limb arteries surgery

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Abstract.

A total of 290 patients with peripheral arterial disease have undergone reconstructive aortic and low limb arteries interventions. According to age, patients were divided into three groups: I group (n=91) included patients younger 50 years; II group (n=95) – at the age of 50-59 year; III group (n=104) included patients over 60 years old. The rate of yearly thrombotic events was higher in patients younger 50 years compare with patients older age groups. Systematic complications have observed in 72 patients (24,8%). The rate of systematic complications has dramatically increased with age. We have not found any statistically differences between complication rates in young and old patients follow suprainguinal and infrainguinal interventions (5,9% vs. 4,3%, consequently). Systematic complications were more frequent after aorto-iliac reconstruction than infrainguinal in

patients of II and III groups. The average rate in-hospital mortality was – 2.1% (in-hospital mortality of I, II and III group was 1,1%, 2,1% and 2,9%, consequently). Long-term outcomes of 111 patients have been assessed (the median follow-up period was 48,3 months). Age-related 5-year survival rate for operated individuals in I, II and III group was 85,0±9,8%, 78,1±14,6% и 72,1±15,8%, consequently. The leading reasons for death in each group were cerebral and coronary catastrophes. The primary 5-year patency rate in patients of I group was lower than in more elderly patients (61,9±14,4% - for I group vs. 81,7±15,0% and 92,1±11,0% in patients of II and III group, consequently (p<0,05)). A dominant reason for reocclusion in young patients within a period of 1-2 years follow surgery was intimal hyperplasia.

Keywords: peripheral arterial disease, reconstructive surgery, complications of vascular surgery, age, long-term outcomes, short-term outcome

Association nuclear genome mutations with myocardial infarction

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Abstract

Objective: This review is dedicated to a description of nuclear genome mutations associated with increased risk of myocardial infarction (MI).

Materials and methods: Scientific articles from NCBI base (ncbi.nlm.nih.gov) were used to work on this review.

Results and discussion: A number of data from domestic and foreign literature was analyzed. It was shown that in the presence of these mutations, as a rule, pathologies in cardiovascular, muscular and nervous systems occur, which are usually characterized by a late manifestation of clinical symptoms.

Conclusion: The large sample analysis of patients and a description of hundreds of genealogies, information about the relationship between genotype and phenotype, structure and frequency of mutations in myocardial infarction let us reveal a number of important mutations in genes regulating the metabolism of lipids and carbohydrates which are responsible for the functional activity of the enzymes. The mutations cited in the article are classified by their localization in genes of human nuclear genome.

Keywords: mutation, aminoacids, mitochondrial genome, myocardial infarction.

Simvastatin in ischemic stroke

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Abstract

Aim. To estimate mortality and frequency of recurrent cardiovascular events, dynamics of neurological deficit, endothelial dysfunction and renal function in patients with the first-time ischemic stroke treated with simvastatin 40 mg/day in acute period of the disease.

Materials and methods. The efficacy of simvastatin (40 mg/day) therapy initiated in acute stage of ischemic stroke was evaluated in 12-month comparative randomized study. Patients of the first group (n=105) received standard stroke therapy, and patients of the second group (n=105) also received standard treatment and simvastatin additionally. Combined endpoint (cardiovascular death +recurrent cardiovascular events + necessity of readmission), dynamics of neurological status and endothelial function were considered.

Results. Primary combined endpoint was achieved in 64 cases in the first group (60,9%) and in 49 (46,6%) in the second one ($p=0.037$). Neurological status evaluated by National Institutes of Health Stroke Scale (NIHSS) and Scandinavian scales had a faster positive dynamics in patients receiving simvastatin. The same patients revealed more intense and quick decrease in desquamated plasma endotheliocytes.

Conclusion. Simvastatin 40 mg/day prescribed along with neuroprotective and antihypertensive treatment in acute stage of ischemic stroke leads to lowering of recurrent cardiovascular events number, positive dynamics of neurological status, regression of endothelial dysfunction , associated with improved renal function.

Keywords: ischemic stroke, simvastatin, endothelial dysfunction, renal function, cardiovascular events.