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ABSTRACTS

Are small and moderate stenosis of carotid arteries the risk factors for cerebrovascular complications in patients in coronary artery bypass grafting?

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Abstract

Currently, a surgical intervention can not be evaluated as a successful one if a patient develops cerebrovascular complications after the surgery. This literature review presents the modern data on clinical and functional features of a combined atherosclerotic lesion of coronary and carotid arteries, incidence of detection and their prognostic value. Also, current studies designed to identify the causes of development, the pathogenesis and to prevent the development of these complications in cardiosurgical patients are analyzed. The role of small and moderate stenoses of carotid arteries and their impact on the development of cerebrovascular complications of coronary artery bypass grafting are reviewed. It is discussed that the patients with small and moderate stenoses are more vulnerable in cardiosurgical interventions as compared to the patients without stenotic lesion of carotid arteries. An additional reason for the development of cerebrovascular complications in these patients is that initially they have a more pronounced violation of a cerebral blood flow autoregulation which ensures the brain resistance to the episodes of acute ischemia and hypoperfusion in arterial blood pressure changes during the surgery, than in patients without stenosis. A combination of low heart contractility and a low cerebrovascular reserve increases the risk of complications development in this cohort of patients.

Keywords: cerebrovascular complications, stroke, cardiac surgery, coronary artery bypass grafting, small and moderate stenosis of carotid arteries, prognosis, atherosclerosis.

Level of oxidized lipoproteins of low density and endothelial status in patients with objective atherosclerosis of lower limbs after reconstructive operations on aorto-iliac-femoral segment

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Abstract

Aim. Evaluation of the relationship between the level of oxidized lipoproteins of low density (oxidized LDL) and endothelial status in the systemic and local blood flow in patients with obliterating atherosclerosis of the lower extremities before and after reconstructive operations.

Methods. The study included 68 patients with obliterating atherosclerosis of the arteries of the lower extremities, the average age was 57.9 ± 0.88 years, with II B - III degree of chronic arterial insufficiency according to R. Fontaine - A.V. Pokrovsky, who were divided into three groups

depending on the scope of the surgical intervention: 1 group had femoropopliteal shunting (n = 32), 2 - aorto-femoral bypass (n = 20), 3 - x-ray endovascular angioplasty and stenting of the iliac arteries (n = 16). A correlation analysis was made between the content of oxidized LDL and markers of the endothelial status: the vascular endothelial type 1 adhesion molecule (sVCAM-1), Annexin V, the tissue type I plasminogen activator inhibitor (PAI-1), the tissue plasminogen activator (t-PA) in the systemic blood stream in the affected limb prior to surgery and in the early postoperative period.

Results. The level of oxidized LDL was closely associated with a violation of endothelial status. A correlation was found between oxidized LDL and sVCAM-1, both at the systemic level and in the affected limb, and this association persisted after reconstructive intervention, the most significant in patients after femoropopliteal bypass surgery. The relation between oxidized LDL and imbalance of fibrinolytic activity with an increase in prothrombotic potential was revealed for all types of reconstruction. Significant positive correlation between oxidized LDL and Annexin V as a marker of endothelial dysfunction was determined in patients after X-ray endovascular correction of the iliac segment and a weak negative correlation between oxidized LDL and Annexin V in the systemic and local blood flow in patients after open arterial reconstructions.

Conclusion. Oxidized LDL contribute to the disturbances of the endothelial status of the vascular bed in patients with obliterating atherosclerosis of the lower extremities, with the activation of inflammation, apoptosis, increased adhesion molecules, inhibition of fibrinolysis, and persistent after surgical correction of arterial hemodynamics both at the systemic level and in the affected limb.

Keywords: atherosclerosis obliterans, Oxidized low-density lipoprotein (Ox-LDL), endothelial status, reconstructive surgery.

Accuracy of blood lipids determination on express analyser CARDIOCHEK PA

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Abstract.

The aim of the study is to compare the accuracy of results of determination of the blood lipid spectrum in the capillary blood samples analyzed on a portable (CardioChek PA) and stationary (Roche Cobas c 702) biochemical analysers.

Methods. The study was conducted on 36 male and female volunteers aged from 18 to 65 years. The biomaterial was taken by highly qualified nurse. At first there was rapid testing and then capillary blood sampling from the same puncture into the standard micro tubes with clotting activator and separator gel for studies on stationary analyzer was performed. The paired difference in results obtained by different methods for each indicator was calculated in absolute and relative units according to the results of the statistical bootstrap and regression analysis. In addition, the comparison of average bias for each analysis was compared with the analytical variation (CVa) according to the formula reference change values (RCV).

Results. The following deviations between the results obtained by usage of point-of-care testing (CardioChek PA) and Roche Cobas c 702 were demonstrated: total cholesterol (TC) – the average offset based on the bootstrap estimates -3.70%, $R^2 = 0.6515$; cholesterol high density lipoprotein (HDL) +9.16%, $R^2 = 0.9198$; triglycerides (Tg) +8.99%, $R^2 = 0.8912$; cholesterol low-density lipoprotein calculated according to the formula of Friedwald (LDL) -13.35%, $R^2 = 0.7176$ and the result of direct measurement -23.96%, $R^2 = 0.6943$. Due to difference of capillary and venous blood results, the offset for the cholesterol average was -1.08% and fits into the limit of CVa for the method. However, most other couples of the bias taking into account their 95% confidence intervals (CI) do not fit in the CVa for the considered methods.

Conclusions. The results of TC assays, obtained by point-of-care testing, are comparable with the results obtained on a stationary analyzer, and can be used for a preliminary assessment of hypercholesterolemia to determine the cardiovascular risk category. TG results can also be used for pre-screening of hypertriglyceridemia. Systematic biases of other studied biomarkers do not allow the use of rapid testing for more accurate diagnosis of dyslipidemia and monitoring of the effectiveness of lipid-lowering therapy.

Keywords: point-of-care, lipid profile of blood, dyslipidemia

Aortic-brachial stiffness gradient in patients with stable coronary artery disease and peripheral arterial disease

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Absrtact

Aim. To assess the indices of regional vascular stiffness and aortic-brachial stiffness gradient (abSG) in patients with coronary artery disease (CAD) depending on the prevalence of atherosclerosis of peripheral arteries.

Materials and methods. The study included 140 patients with stable CAD. All patients underwent ultrasound scanning of carotid arteries and lower limb arteries. Patients were divided into three groups, depending on the results of duplex scanning. The first group included patients with CAD and intact peripheral arteries (absence of atherosclerotic plaques), the second group included patients with plaque in one of the vascular pools, in the third group - patients with CAD and plaque in both vascular pools. The regional aortic stiffness and stiffness of the muscular arteries was measured by applanation tonometry. After measuring of the carotid-femoral pulse wave velocity (cfPWV) and the carotid-radial pulse wave velocity (crPWV) was calculated as the ratio $abSG\ cfPWV/crPWV$.

Results. According to the measurement of vascular stiffness, the values of cfPWV and crPWV were not significantly different between groups of patients. At the same time, the values of $cfPWV/crPWV$ were statistically significantly higher in the third group of patients compared to both the first group of patients ($p=0.023$) and the second group ($p=0.047$). The increase in abSG was associated with an increase in the age of the patients ($r=0.392$; $p=0.0001$), carotid artery stenosis ($r=0.222$; $p=0.007$) and lower limb arteries ($r=0.243$; $p=0.004$), carotid arteries ($r=0.306$; $p=0.0001$). When carrying out a polynomial logistic regression adjusted for factors such as gender, hypertension, smoking, obesity, diabetes mellitus, low-density lipoprotein cholesterol, C-reactive protein, glomerular filtration rate, inversion of the gradient of vascular stiffness increased the relative risk of multifocal atherosclerosis in 3.52 times (95% confidence interval 1.27-9.77; $p=0.015$).

Conclusion. Patients with CAD and concomitant atherosclerosis of the carotid arteries and lower limb arteries had statistically significantly higher values of abSG compared with patients with CAD and atherosclerosis in one peripheral artery pool, as well as with CAD and intact peripheral arteries. Inversion of abSG was associated with an increased risk of combined peripheral arterial disease.

Keywords: coronary artery disease, vascular stiffness, pulse wave velocity, peripheral arterial disease.

Toxicity of calcium phosphate bions for aortic adventitia in rats

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Abstract

Aim. To investigate whether calcium phosphate bions (CPB) induce adventitial inflammation.

Materials and Methods. Toxicity of spherical calcium phosphate bions (CPBS), needle-shaped calcium phosphate bions (CPBN), and magnesium phosphate bions (MPB) for aortic intima of Wistar rats was assessed by intravenous administration immediately upon the angioplasty. After 5 weeks, rats were sacrificed, and injured aortic segments were then examined utilizing hematoxylin and eosin staining.

Results. In contrast to CPBS and CPBN, MPB did not provoke intimal hyperplasia. Neointima formation was induced by both mechanical injury and endothelial toxicity of CPB. This also triggered adventitial inflammation as demonstrated by an increased count of lymphoid-like follicles.

Conclusions. Intravenous administration of CPB after the balloon injury caused intimal hyperplasia of rat abdominal aortas and stimulated the formation of adventitial lymphoid-like follicles. This points on the association between CPB endothelial toxicity and adventitial inflammation.

Keywords: atherosclerosis, bions, nanoparticles, toxicity, endothelium, intimal hyperplasia.

Inkretine and adipokine state among young and middle-aged men with initial atherosclerosis

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Abstract

Objective: to determine the peculiarities of inkretine and adipokine state in relation to lipid-carbohydrate metabolism among young and middle-aged men with initial atherosclerosis of the carotid arteries.

Material and methods: have been examined 530 men 38.5±5.6 years old; 448 (80%) of them were men of young age (from 30 to 44 years), 82 (20%) person – middle-aged (from 45 to 55 years old). All the patients have been divided into 2 groups: 1st – 106 men with ultrasonic

characteristics of primary atherosclerosis of common carotid arteries; 2nd – 424 men without changes of the vascular wall. Have been evaluated lipidogram, glucose tolerance test, investigated the levels of adipokines and inkretines to determine the metabolic changes.

Results: intima-media thickness in patients with initial atherosclerosis was 1.2 ± 0.3 mm, in 2nd group – 0.65 ± 0.1 mm respectively ($p < 0.001$). Arterial hypertension was found from 69% (1st) vs 33% (2nd group) of men ($\chi^2=43.9$; $p < 0.001$); abdominal obesity – 63 vs 43% ($\chi^2=12.9$; $p<0.001$). Dyslipidemia was diagnosed in 60% of men in 1st group and 30% of the patients 2nd group ($\chi^2=19.4$; $p<0.001$). The frequency of prediabetes and early postload hyperglycemia in 1st and 2nd groups amounted to 39 vs 28% ($p>0.05$) and 63 vs 43% ($\chi^2=5.6$; $p=0.017$); he combination of dyslipidemia and prediabetes – 27 vs 15% ($p>0.05$); dyslipidemia and the early postload hyperglycemia – 48 vs 19% of patients ($\chi^2=14.4$; $p < 0.001$), respectively. In patients with initial atherosclerosis determined maximum values of leptin, IL-6 and TNF- α . Was defined as a stable positive relationship of atherosclerosis, disorders of lipid and carbohydrate spectrum with leptin concentration.

Conclusion: the level of serum leptin should be used as an additional marker of defeat of the cardiovascular system and the initial atherosclerosis in patients with abdominal obesity.

Keywords: initial atherosclerosis, adypokines, incretines, dyslipidemia, dysglycemia, metabolic syndrome, young and middle-aged men.

Laboratory predictors and markers of successful reperfusion in patients with ST-segment elevation myocardial infarction

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Abstract.

The article present the results of a study on the noninvasive evaluation of the efficacy of thrombolytic therapy (TLT) in myocardial infarction with ST segment elevation (IMPST). The obtained data indicate that an increase in the concentration of markers of myocardial damage-the cardiospecific CF-fraction of creatine phosphokinase (CF CK), the cardiospecific I-fraction of troponin, and also the D-dimer, are markers of myocardial reperfusion. But initially (before the thrombolysis) increased concentration of D-dimer - will be a predictor of the success of the TLT.

Keywords: acute myocardial infarction with ST-elevation, fibrinolytic therapy, CK MB, troponin I, D-dimer, predictors of myocardial reperfusion.

Evolocumab – new opportunities for cardiovascular risk management in patients with atherosclerosis and diabetes

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Consensus Statement. Cardiovascular diseases and type 2 diabetes mellitus: new opportunities for reducing mortality

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Abstract

In the current Consensus Statement a discussion of the extremely topical issue of treating patients with type 2 diabetes and cardiovascular pathology is presented. The reason for this discussion was the emergence of a new glucose-lowering drug, SGLT2 inhibitor empagliflozin, and its inclusion in foreign and Russian recommendations for management of patients with diabetes mellitus. This drug is considered as first-line when type 2 diabetes mellitus is combined with ischemic heart disease and/or circulatory insufficiency. A special focus in the current Consensus Statement is on the EMPA-REG OUTCOME trial.

Keywords: type 2 diabetes, cardiovascular risk, empagliflozin.

Anniversary of Yu. P. Nikitin

News from congresses on atherosclerosis 2018