Atherosclerosis and Dyslipidaemias
An official Journal of the Russian National Atherosclerosis Society (RNAS)
2013 №3 (12)
ABSTRACTS

Instrumental and laboratory methods to identify unstable atherosclerotic plaques

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Abstract
This report examines the capability of different instrumental and laboratory methods in determination of unstable atherosclerotic plaques. Among discussed instrumental methods are nuclear imaging, magnetic resonance imaging, computed tomography, intravascular ultrasound, optical coherence tomography and duplex ultrasound. Among described biochemical markers are C-reactive protein, cytokines, oxidized LDL, chemokines, glutathion peroxidase, myeloperoxidase, matrix metalloproteinases, placental growth factor, pregnancy-associated plasma protein A, soluble CD40 ligand and lipoprotein-associated phospholipase A2.
Keywords: unstable atherosclerotic plaque, duplex ultrasound of the carotid arteries, lipoprotein associated phospholipase A2.

Statins and liver

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Abstract
The article contains literature survey on the issue of statin effect on liver. It represents modern recommendations for the safe statin treatment.
Keywords: statins, liver, drug safety.

Dynamics of indices of vascular stiffness and lipid metabolism in patients with coronary heart disease during treatment with high-dose atorvastatin

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Abstract
Objective: to estimate the effects of treatment with atorvastatin 80 mg daily on lipid profile, C-reactive protein and the structural and functional arterial properties in patients with proven coronary artery disease.
Methods: the effects of 24 weeks of treatment with atorvastatin 80 mg on lipid metabolism, ALT, AST, CK, CRP, the thickness of the intima-media carotid artery were studied in 25 patients (22 men and 3 women) aged 35 to 71 years (mean age 56,5 ± 9,01 years) with

established coronary artery disease and dyslipidemia. Endothelial function was examined by ultrasound. Arterial stiffness was evaluated by volume sphygmography, the daily parameters of arterial stiffness were studied.
Results: a significant reduction in total cholesterol, LDL cholesterol, triglycerides, and CRP was observed. The absence of dynamics of hepatic transaminases shows the safety of the therapy. Atorvastatin therapy significantly reduces the intima-media thickness and allows to achieve the improvements of endothelial function. The improvement of arterial elastic properties according to the volume sphygmography and the reducing of aortic augmentation index, based on the daily monitoring of arterial stiffness were marked.
Conclusion: the intensive treatment by atorvastatin in patients with proved coronary artery disease, along with a pronounced positive effect on the lipid profile is accompanied by a regression of active inflammation in the vascular wall, improvement of the structural and functional arterial properties.
Keywords: dyslipidemia, C-reactive protein, coronary heart disease, atorvastatin, endothelial dysfunction, structural and functional arterial properties

Survival rate functions in cohorts of men aged 40-59 depending on presence of arterial hypertension and old myocardial infarction at various concentration of HDL-c (ACCORDING TO 30-YEAR PROSPECTIVE STUDY)

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Abstract
PURPOSE. Study of interrelation of HDL-C level with 30-year survival rate in cohorts of men aged 40-59 with different CVD status using function of survival rate.
METHODS AND RESULTS. Four representative samples of men aged 40-59 from the inhabitants of Metallurgical area of Chelyabinsk differing by the status of health are generated in a random way: practically healthy [H, 174 people], patients with arterial hypertension [AH, 149 people], patients with old myocardial infarction [MI, 198 people], patients who suffered a combination of MI and AH [MIAH, 154 people]. The period of supervision has ranged between 0 and 30 years. The end point has been death case. In the specified cohorts the estimation of functions of 30-year survival rate is based on Kaplan-Mayer method. Confidence bands of function of survival rate have been created on the basis of Kolmogorov-Smirnov nonparametric criteria. The association between HDL-C and mortality has been analyzed by Cox proportional hazards model.
RESULTS. Influence of initial HDL-C concentration on functions of 30-year survival rate in cohorts of men aged 40-59 (545 people) is shown irrelevant of presence of arterial hypertension or old MI. Increase in concentration with 0.3 to 1.7 mmol/l in cohorts is accompanied by authentic increase in survival rate.
CONCLUSIONS. Characteristics of functions of 30-year survival rate in the studied cohorts of men aged 40-59 with increase in HDL-C level show heterogeneity at the start and the duration of the periods of various authentic survival curves, that testifies to authentic influence of HDL-C concentration on survival rate functions in cohorts, its influence being dependent on CVD status and supervision periods.
Keywords: HDL-C, survival rate, prospective cohort study.

Correction of lipid, hemostasic disorders and remodeling of brachiocephal arteries in patients of very high risk of cardio-vascular death

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Abstract
Purpose. To study peculiarities of clinical features of ischemic heart disease, lipidemic and coagulation infractions and remodeling of brachiocephalic trunk arteries in patients of very high cardiovascular death risk and also correction capabilities of the indentified changes with dose escalation statin therapy.
Methods. Studied were 116 patients with ischemic heart disease (mean age – 54.7±3.5 years). We evaluated fibrinogen, D-dimer, ADP-induced platelet aggregation, von Willebrand factor and also lipid spectrum analysis and ultrasound triplex scanning of arteries of brachiocephalic trunk.
Results. 24 week with atorvastatin and rosuvastatin treatment resulted in reducing of total cholesterol, LDL-cholesterol, triglycerides, von Willebrand factor, D-dimer, fibrinogen levels and increasing of interval to the beginning of ADP-induced platelet aggregation ($p<0.05$). Atorvastatin also increased HDL-cholesterol level ($p<0.05$). Cross-sectional area of the lumen of the left internal carotid artery due to atorvastatin therapy increased by 25.6% ($p<0.05$), and cross-sectional area of the lumen of the right internal carotid artery due to rosuvastatin treatment increased by an average of 21.6% ($p<0.05$).
Conclusion. Long term statin therapy results in clinical improvement, achievement of target levels of lipid metabolism and also reduction of the severity of endothelial dysfunction and trombogenic potential of the blood, slowing in some cases atherosclerosis progression in arteries of brachiocephalic trunk.
Keywords: dyslipidemia, coagulation, brachiocephalic trunk, cardiovascular diseases, risk of death, statins.

Heteroplasmy A1555G mutations of the mitochondrial genome in homogenates of the atherosclerotic aortic intima

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Abstract
Objective: This research is a pilot study and its purpose was to study the association of atherosclerosis and somatic mutation A1555G.
Materials and methods: As a material for the study total aortic intima tissues of people, who died as a result of an accident or a sudden death were used. Normal and atherosclerotic aortic intima sections were homogenized, well mixed and 10 μg of the tissue were taken for DNA extraction. 10 aortas were taken for the investigation. After PCR the amplificates were pyrosequenced to identify the percent of heteroplasmy
Results and discussion: In the present paper the heteroplasmy of mitochondrial gene 12S rRNA in DNA samples isolated from total homogenates of normal and atherosclerotic aortic intima was

studied. It was found out that the heteroplasmy level of A1555G mutant allele in the samples with atherosclerotic lesions is significantly higher compared to homogenates of normal intima.
Conclusion: On the basis of the received data, it can be concluded that somatic mitochondrial mutation A1555G (12S rRNA gene) is associated with atherosclerosis.
Keywords: mutation, mitochondrial, genome, homogenate, heteroplasmy, atherosclerosis.

The microcirculation in patients with arterial hypertension

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Abstract
Objective: To study the features of the microcirculation in patients with hypertension, as well as in healthy volunteers by high-frequency Doppler ultrasound. Materials and Methods: 146 patients (66,1 ± 5,8 years) with hypertension I-II degree was included as I group (mean age was 66.1 +5.8 years). The control group included 34 healthy volunteers (mean age 53.4 +7.8 years). Results and Conclusions: Patients with hypertension in contrast to healthy volunteers initially have a higher rate of blood flow of microcirculation. Maximum speed at the maximum speed curve more sensitive to disturbances occurring rather than linear speed to the average velocity of the envelope curve. There was correlation between the linear velocities and age, duration of hypertension, SBP and DBP, and creatinine levels. Patients with hypertension with glomerular filtration rate less than 60 ml \ min are stitched or pathological response microcirculation in response to reactive hyperemia and cold test compared with healthy patients and patients with hypertension and preserved renal function.
Keywords: arterial hypertension, microcirculation

The development of atherosclerosis and its complications in patients with high levels of c triglycerides or low HDL

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Abstract
The aim of this work is to demonstrate patients with dyslipidemia (DLP) and atherosclerosis who have a high level of blood triglycerides (TG) or a very low content of antiatherogenic high density lipoproteins (HDL) in the absence of hyperlipidemia (HLP). Material and methods. There were examined 30 patients with hypertriglyceridemia (HTG) who had TG level >4,0 mmol/l and 25 patients with a low HDL content (<0,90 mmol/l) in the absence of HLP.
In all cases blood lipid spectrum was examined twice. Clinical investigation was aimed at the revealing of atherosclerosis in different vascular beds. Results. 30 patients with HTG (average age 47 years old) were divided into two groups: 20 persons with TG level=15,2±2,4 mmol/l and clinical manifestations of atherosclerosis and 10 persons with TG level=19,0±3,8 mmol/l without clinical manifestations of atherosclerosis. All 25 patients with a low HDL content (0,76±0,02 mmol/l) and average age of 46 years old had atherosclerosis of coronary or cerebral vessels although they had not HLP as itself. The data show that a complicated atherosclerosis can develop mainly in men after 40-45 years of age not only with hypercholesterolemia but also with other dyslipidemic states.
Keywords: dyslipidemia, atherosclerosis, hypertriglyceridemia, high density lipoproteins.

Atherosclerosis 2013: prevention, diagnostics and treatment. Annual Collaborative meeting 2013 of Italian and Russian Society of Atherosclerosis (under the auspices of European Society of Atherosclerosis)

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