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ABSTRACTS

Dendritic cells and their potential importance for immunotherapy of atherosclerosis

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Abstract

Dendritic cells (DCs) are immune sensors and a key element of the interconnecting links between the innate and adaptive immune system. The presence of DCs in the arteries was discovered in 1995 and during the subsequent years, it has been appreciated that DCs play an important role in maintaining the homeostasis in the arterial intima as well as in the development of atherosclerosis. In this review, we briefly describe the properties of the family of DCs and provide information indicating the importance of DC in atherogenesis. The key importance of DCs in the regulation of immune processes requires the evaluation of possibilities of using this cell type for immunotherapy of atherosclerosis.

Key words: dendritic cells, immune responses, atherosclerosis, immunotherapy.

Endovascular treatment with bioresorbable vascular scaffold system. The first experience in Russia

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Abstract

The article presents the first Russian experience with the bioresorbable vascular scaffold system for endovascular treatment of coronary atherosclerosis. It contains description of the bioresorbable vascular scaffold Absorb, stages of its biodegradation in the vessel and clinical example with coronary angiograms and IVUS images.

Key words: percutaneous coronary intervention, bioresorbable system, vascular reparative therapy.

Chronic total occlusions of coronary arteries: morphology, pathophysiology, technique of Recanalization

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Abstract

Percutaneous coronary intervention (PCI) for chronic total occlusions of coronary arteries (CTO) is a rapidly evolving field of interventional cardiology.

Recanalization of the coronary arteries is a technically difficult intervention. The most common cause of unsuccessful recanalization of a CTO is failure to cross intracoronary wire the proximal and distal caps of a CTO. Over the past few years in order to understand the morphology and pathophysiology CTO's the investigations which has been developed and put into practice a specialized tool and techniques for recanalization of the CTO. In this article, based on clinical studies overview of the most effective stents in CTO, with low restenosis rate.

Key words: percutaneous coronary intervention, coronary heart disease, chronic total occlusions, recanalization.

3D-ultrasonic visualization capabilities studying size and structure of atherosclerotic plaques

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Abstract

It was studied the analysis of published data on the opportunities and prospects of using the three-dimensional ultrasound imaging method for the atherosclerotic vascular lesions evaluation. It is shown that 3D-ultrasound is one of the most effective and highly informative diagnostic noninvasive lesions of arterial pools.

Three-dimensional reconstruction significantly increased the capabilities of traditional ultrasound, allowing a vessel in the image of the investigated area, and receive its projections sloping section, raising the possibility of a detailed description of the pathological process features.

The features and stages of three-dimensional images construction, the algorithms of its analysis, the ability to assess the atherosclerotic plaques characteristics: volume, structure and surface condition of the plaque. The analysis reports comparing diagnostic features 3D-ultrasound and other imaging techniques in the study of atherosclerotic arteries, the advantages of the method: non-invasive, portable, reducing discomfort for the patient. It was concluded about the prospects of research on possibilities of three-dimensional ultrasound in the atherosclerotic changes of the carotid, femoral artery and aorta visualization; defining the structure and volume of atherosclerotic plaques, as well as to assess the state of the arterial wall after endovascular or surgical procedures.

Key words: 3D-ultrasound, duplex scanning, atherosclerotic plaque, magnetic resonance imaging.

Lipoprotein-associated phospholipase A2 mass and activity serum levels and carotid atherosclerosis in patients with different categories of cardiovascular risk

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Abstract

Aim. To assess the connection between lipoprotein-associated phospholipase A2 (Lp-PLA2) mass and activity levels and carotid atherosclerosis severity.

Methods. 519 patients (162 men, 357 women, the mean age is 57.0 (51.0-64.0) years) were included in this study. Cardiovascular risk factors evaluation, clinical examination, biochemical analysis of blood with lipidemic profile, Lp-PLA2 levels determination and duplex ultrasound of the carotid arteries were performed.

Results. Median Lp-PLA2 activity serum level was 202.4 (178.5 -232.6) nmol/min/ml. Median Lp-PLA2 mass serum level was 220.4 (197.1-247.2) ng/ml. There was a positive correlation between Lp-PLA2 activity (but not mass) levels and carotid atherosclerosis severity. The number of atherosclerotic plaques ($p=0.01$), maximal ($p=0.03$) and total ($p=0.004$) percent of carotid arteries stenoses were higher in patients, who had their Lp-PLA2 activity levels in the upper three quartiles compare to patients, who had their Lp-PLA2 activity levels in the lower quartile.

Conclusion. Our data confirmed that there was a relation between Lp-PLA2 serum levels and carotid atherosclerosis severity. Lp-PLA2 activity was more associated with carotid atherosclerosis than Lp-PLA2 mass.

Keywords: lipoprotein-associated phospholipase A2, duplex ultrasound of the carotid arteries, carotid atherosclerosis.

Analysis of mitochondrial gene G12315A heteroplasmy mutations in homogenates of lesions of the human aortic intima

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Abstract

Aim. To assess the level of heteroplasmy in the mutant allele G12315A in DNA samples obtained from total homogenates of normal and atherosclerotic intimal 10 aortas.

Materials and methods. Homogenization affected and normal sections of aortic intima. Conducting amplification study mutations and then holding pyrosequencing to identify percent heteroplasmy for a curious mutation.

Results. The data for the mutation G12315A shows that level of heteroplasmy in homogenates of atherosclerotic statistically significant higher compared with homogenates of normal vascular tissue.

Conclusion. The results suggest that a single nucleotide change of guanine to adenine at position 12315 of the mitochondrial genome leads to defect tRNA-Leu and the inability to perform its function of mutant tRNAs. A consequence of the critical level of heteroplasmy for the mutation is reduction of enzymes in the mitochondrial respiratory chain, leading to decrease of cell energy level.

Keywords: mitochondrial mutations, total intimal homogenates, atherosclerosis, heteroplasmy, mutation.

Gender features of the effectiveness of lipid-lowering therapy in patients with metabolic syndrome

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Abstract

Objective. Rate lipid-correction effect, the effect on C-reactive protein (CRP), intima-media thickness (IMT) and the remodeling of the left ventricle (LV) of lipid-lowering therapy in men and women with metabolic syndrome (MS).

Materials. 1172 patients with MS (81 male and 91 female), median age 59 (52-67) years. All patients were assigned to simvastatin 20 mg daily, sufficient to reach the level of low density lipoprotein cholesterol (LDL-C) in 29 patients. The remaining patients were randomized into two groups: the first group, the dose of simvastatin was increased to 40 mg daily, patients second group was assigned the combination of simvastatin 20 mg and 10 mg ezetimibe.

Methods. Biochemical tests – lipid profile, CRP was assessed at baseline and at 1, 2 and 6 months. Echocardiography and Doppler ultrasound IMT of the carotid arteries was performed before and after 6 months of treatment

Results. Monotherapy with simvastatin 40 mg daily provided the achievement of the target level of LDL cholesterol in 81.2% of men and 55.9% of women ($p<0.05$), and combination therapy – in 86.8% of women and 64.1% of men ($p<0.05$). After 6 months of simvastatin monotherapy or combination therapy in men

changes in CRP, IMT were comparable; women combined therapy was superior to monotherapy on the effect on the studied parameters. Simvastatin monotherapy and combination therapy were accompanied by improvements in left ventricular remodeling in both sexes ($p<0.05$), but a more pronounced positive changes were observed in

women on combined therapy. In men, the effectiveness of simvastatin monotherapy and combination therapy on left ventricular remodeling parameters were comparable.

Conclusion. Simvastatin monotherapy and combination therapy with simvastatin and ezetimibe, regardless of gender lipid-correction provide reliable, antiinflammatory, anti-remodeling effects in patients with MS. In men, the tactics of both lipid-lowering therapy are equally effective in women is more significant dynamics of indicators was observed with combination therapy.

Keywords: arterial hypertension, microcirculation.

Interleukin-6 and high density lipoprotein cholesterol levels association with atherosclerotic lesions severity in coronary arteries

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Abstract

Aim. To determine the association between cardiovascular disease risk factors and presence of coronary arteries lesions with the involvement of left main coronary artery (LMCA).

Methods. We included male and female patients 40-60 years old, who underwent coronary angiography: with coronary atherosclerosis and LMCA involvement – group 1 ($n=83$), with coronary atherosclerosis without any lesions in LMCA – group 2 ($n=88$), and patients with intact coronary arteries – group 3 ($n=34$). All patients identified Cardiovascular disease traditional risk factors as well as lipoprotein (a), interleukin-6, C-reactive protein serum levels were determined in all patients.

Results. A percent of women was higher in group 3 compare to group 1 and group 2 (59% vs 17% $p=0.00001$ and 59% vs 16% $p=0.00001$, respectively), as well as a percent of smokers was lower (19% vs 44% $p=0.03$ and 19% vs 61% $p=0.0001$, respectively), as was expected. All patients were treated with hypolipidemic therapy, however the levels of high density lipoprotein was significantly lower in the group 1 compare to group 2 and group 3 (1.04 ± 0.29 vs 1.2 ± 0.49 , $p=0.04$ and 1.04 ± 0.29 vs 1.28 ± 0.35 , $p=0.005$, respectively). The levels of lipoprotein (a) were not significantly different between the groups. Serum interleukin-6 had a tendency to increase in the group 1 versus group 3 (4.31 ± 5.24 vs 2.06 ± 1.8 , $p=0.06$, respectively).
Keywords: risk factors, left main coronary artery, lipoprotein (a), interleukin-6, high density lipoprotein.

The diagnostic value of adhesive molecules sICAM -1 and sVCAM-1 in ischemic heart disease

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Abstract

Ischemic heart disease (IHD) is associated with chronic inflammation as usual. The role of a number of non-specific inflammatory markers (CRP, fibrinogen and others) in atherosclerosis pathogenesis has been described in details. On the early stages atherosclerotic inflammation stimulates monocytes adhesion to activated endothelial cells due to over expression of adhesion cell molecules on cellular membranes. The increased serum levels of soluble forms of these molecules (sICAM-1, sVCAM-1) are revealed in many diseases, including acute coronary syndrome and chronic heart failure. The data of a number of studies, in witch these serum markers were determined in patients with different forms of IHD are presented in this article.

Conclusion. sICAM-1 and sVCAM-1 may be used as additional laboratory markers for the evaluation of the severity of inflammation in different IHD forms.

Keywords: ischemic heart disease (IHD), atherosclerosis, intracellular adhesion molecule ICAM-1, vascular cell adhesion molecule VCAM-1.