The role of ultrasound imaging of subclinical carotid atherosclerosis in predicting of cardiovascular risk in primary prevention of cardiovascular diseases.

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Abstract
Calculation of the risk of score (a high-risk strategy) is a standard of cardiovascular risk evaluation, but the majority of acute cardiovascular events occur in individuals with a low calculated risk. Early detection of subclinical atherosclerosis (SA) as a powerful predictor of the acute cardiovascular events is the most promising alternative approach. In this review we discuss the carotid ultrasound - one of the most common methods of SA detection. Despite the large number of studies and an undoubted interest in this technique there are a large number of still unresolved issues associated with it.
Keywords: cardiovascular risk , subclinical atherosclerosis, ultrasound of the carotid arteries.

Chromatographic determination of the content of fatty acids in different biological environments at atherosclerotic damages

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Abstract
The review analyzes the literature related to the role of fatty acids in diseases with atherosclerotic damage. The results of experimental research in this area, confirming that the study of fatty acids is a promising emerging area of research.
Keywords: atherosclerosis, fatty acids, biomarkers, chromatographic profiles, review.

The relationship between myeloid dendritic cells CC chemokine CCL17 concentrations with the severity of coronary atherosclerosis.

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Abstract:

Aim. The study explored the association between circulating myeloid dendritic cells and chemokine CCL17 with the severity of coronary atherosclerosis and the presence of hemodynamically significant stenoses of the coronary arteries. The effects of the inflammatory response, which occurs in response to the implantation of a coronary stent, in the levels of CCL17 and MDC were also evaluated.

Materials and Methods: The study involved 82 male patients, who underwent coronary angiography and 10 heathy individuals. Patients were divided into 4 groups based on the severity of coronary atherosclerosis. In addition, all patients were divided into 2 groups according to the presence of hemodynamically significant stenoses of the coronary arteries. The severity of atherosclerotic coronary lesions was evaluated using the Gensini score. All patients underwent determination of circulating myeloid dendritic cells in the peripheral blood by flow cytometry, chemokine CCL17 by quantitative Sandwich ELISA.

Results: No significant relationships between the levels in blood myeloid dendritic cells and chemokines CCL17 with severity of coronary atherosclerosis were identified. CHD patients with hemodynamically significant stenoses of the coronary arteries were characterized by lower levels of myeloid dendritic cells.

Key words: atherosclerosis, inflammation, dendritic cells, chemokine CCL17.

Association of classic risk factors for cardiovascular disease with the severity of coronary atherosclerosis

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Abstract

Objective: Our aim was to investigate the association of the maximum number of significant risk factors for cardiovascular disease, lipid parameters and inflammatory parameters with the severity of coronary atherosclerosis.

Methods: A total of 314 patients were included, which diagnostic coronary angiography was performed. The severity of coronary lesions was assessed by the number of affected arteries and the index of Gensini score. Determination of the levels of biochemical parameters was carried out by ELISA method.

Results: Direct association was identified between the number of affected arteries and the gender ($r^2=0.32$; $p=0.0000001$), smoking ($r^2=0.19$; $p=0.0007$), glucose levels ($r^2=0.12$; $p=0.04$) and inverse correlation with HDL cholesterol levels (HDL-C) ($r^2=-0.27$; $p=0.00006$). These parameters have shown an association with the index of Gensini score: gender ($r^2=0.34$; $p=0.0000001$), smoking ($r^2=0.20$; $p=0.0007$), glucose levels ($r^2=0.13$, $p=0.03$), the level of HDL-C ($r^2=-0.31$, $p=0.000004$). Also direct correlation was found of Gensini score index with age ($r^2=0.15$, $p=0.01$) and family history ($r^2=0.12$, $p=0.047$).

Conclusion: The association between the gender, age, smoking, family history, level of HDL-C, glucose levels, and the severity of coronary atherosclerosis was detected. The role of lipoprotein (a) is less significant in the severity of coronary atherosclerosis, but, nevertheless, it needs further refinement.

Keywords: Gensini score, Lp (a), risk factors, severity of coronary lesions.

Exacerbations of chronic obstructive pulmonary disease and coronary atherosclerosis

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Abstract
Objective: to determine the characteristics of coronary lesions in patients with chronic obstructive pulmonary disease (COPD), depending on the frequent exacerbations in medical history.
Methods: 110 patients with COPD, who suffered acute coronary syndrome, were included in cross-sectional study. Patients with frequent exacerbations of COPD was formed into the group (n = 24). As controls, was formed the group without a history of frequent exacerbations (n = 86). In both groupswas assessed the prevalence and severity of coronary atherosclerosisby invasive coronary angiography. One month after discharge from the hospital in non-acute period of COPD we determined in both groups the level of C-reactive protein (CRP) in the blood.
Results: traditional assessment of the severity of coronary lesions by separation on a one-, two-, and three-vessel disease significant differences were not found between the groups. At the same time, the total number of all stenosis, hemodynamically significant stenosis and occlusions/critical stenosis on the average was higher in the group with frequent exacerbations: by 26% (p=0,002), 37% (p=0,003) and 47% (p=0,024) respectively. The main cause for these differences were hemodynamically significant stenosis of the major coronary arteries in the proximal and distal segments (the difference between the groups 31% and 87%, respectively, p=0,041 and p=0,024), and stenosis of secondary branches (54% difference, p=0,023). In the group with frequent exacerbations of COPD level of CRP was higher than control group (3,36 [2,32; 5,10] vs 2,32 [1,70; 3,27]; p=0,017). The correlation between SYNTAX score and CRP level (r=0,29; p<0,01), between the total number of all stenosis and CRP (r=0,36; p<0,001), and between the total number of all stenosis of the major coronary arteries and CRP (r=0,36; p<0,001) was found.
Conclusion: phenotype of COPD with frequent exacerbations is associated with more severe coronary atherosclerosis, probably due to chronic persistent inflammation.
Keywords: acute coronary syndrome, chronic obstructive pulmonary disease, phenotype with frequent exacerbations, coronary atherosclerosis.

Integrated morphological assessment of experimental atherosclerotic lesions in the rabbits aortas

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Abstract
The aim of this study was to develop integrated morphological macro- and microscopic evaluation of vascular lesions on the rabbits atherosclerosis model, to choose the optimal staining techniques, and to develop assessment criteria for evaluating severity of proceeding pathology.

The study was carried out on Californian rabbits. Hypercholesterolemia in animals was developed by cholesterol gavage, and cholecalciferol and adrenaline injection. Biochemical markers were measured and atherogenic index was calculated to confirm pathology.

Animals were euthanizedon the60, 90 and 120-th day of study. Aortas were extracted for morphological study. For a comprehensive evaluation of aorta injuries we performed macroscopic examination of lesion size and histological staining methods of the standard dyes. The degree of aortic lesions was expressed in points by the specified criteria.

We obtained the progression of disease model, confirmed by biochemical markers, and by results of morphological studies. Atherogenic index increased from 1 to 26 for 4 months.

Macroscopic analysis of aortas revealed atherosclerotic lesions expansed to 84% of the total area at the end of the study. During the microscopic analysis of aortic histological sections we observed all stages of atherogenesis: from pre-lipid phase to the complications stage.

Thus, this model allowed to trace the stages in the formation and progression of Californian rabbits atherosclerosis. The proposed comprehensive evaluation system makes possible to clearly and objectively characterize the pathology and ensures the reliability and informativity of the study.

Keywords: experimental atherosclerosis, hypercholesterolemia, rabbits, comprehensive assessment.

Effect of collagen fiber lipoidosis on the development of coronary atherosclerotic plaques in coronary heart disease

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Abstract

Objective. To examine pathomorphological modifications of collagen fibers (CF) and some structural components of coronary atherosclerotic plaques (AP) in CHD and their role in the development of plaque instability and morphogenesis of atherosclerosis and evaluate pleiotropic effects of statins on stabilization of AP.

Materials and methods. Endarterectomized segments of coronary arteries from 92 patients with CHD aged 55-73 years undergoing coronary bypass surgery. Collagen structures, lipids, macrophages and SMC were studied by histological and histochemical methods. Segments from 9 patients were examined under electron microscope.

Computed morphometry of AP was performed in 85 AP in coronary arteries of 19 male patients with CHD and in 30 male and female patients on statins from 3 months to 3 years and longer.

Results. Lipoidosis of collagen fibers in coronary AP was observed in all CHD patients. It coincided with destruction of CF fibers, being a factor facilitating the development of plaque instability. Electron microscopy revealed accumulation of lipid masses between CF fibrils and destruction of these fibrils. Morphometric analysis has revealed AP with varied degrees of stability. Vulnerability of unstable AP was determined by reduced number of stabilizing structures, predominantly of collagen fibers, and depended to a lesser degree on lipid and macrophage contents. Structural changes in unstable AP under the effect of statins (decreased areas occupied by lipids and macrophages and increased area of CF) reflect pleiotropic effects of these drugs and indicate that they produce positive effects on the processes associated with lipid metabolism, vascular wall inflammation and extracellular matrix stabilization.

Keywords: atherosclerosis, coronary heart disease, collagen fibers, instability of atherosclerotic plaques, statins.

Indicators of lipid metabolism in the inhabitants of Mountain Shoria: ethnic peculiarities and the impact of living conditions

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Abstract
Purpose. To assess the differences in lipid metabolism indicators among the inhabitants of Mountain Shoria, estimated in the periods 1998-2002 and 2012-2015.
Materials and methods. The research of lipid metabolism indicators was performed in two stages (stage 1 – 1998-2002, stage 2 – 2012-2015) in the areas of compact settlement of the Shors. We examined 1215 and 572 inhabitants correspondingly. All the inhabitants were divided by the age groups. Statistical data processing was carried out using STATISTICA 10.0.
Results. At all the time stages of the research it was found out that in general men and women of both nationalities showed an increase in manifestations of lipid metabolism disorders along with the age increase. In the period 1998-2002 the levels of total cholesterol, triglycerides and low-density lipoprotein cholesterol (LDL cholesterol) in the elder age groups showed their national differences, represented by more atherogenic shifts in the representatives of non-Shor group. However LDL cholesterol level was less associated with age than other lipids. During the second phase of the study (2012-2015) it was found that the degree of ethnic differences was decreased. The differences in the indicators of total cholesterol and LDL cholesterol, observed in 2000, were not revealed in any of the age groups regardless of gender during the second stage of the research. In the dynamics of 15-year period, it should be noted that the least favourable changes were revealed in young and middle-aged people: both the Shors and non-Shor people of both genders showed the increase in mean values of total cholesterol, LDL cholesterol and the decrease in high density lipoprotein cholesterol concentration. But, this tendency is the most pronounced in the group of indigenous women.
Conclusion. During all research periods of the research (1998-2002 and 2012-2015.) the prevalence of lipid metabolism disorders in the indigenous population of Mountain Shoria both in women and in men was lower than that in non-indigenous population. Over the past 15 years, the inhabitants of this region showed the atherogenic change in lipid profile, in a greater degree in indigenous population.
Key words: dyslipidemia, Mountain Shoria, the Shors, living conditions.