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ABSTRACTS

Structural changes of atherosclerotic plaques according to multislice computer tomography during dynamic follow

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Abstract

The aim of our study was analyze coronary atherosclerosis progression and changes in plaque composition and morphology, including unstability signs, in patients with non-ST segment elevation acute coronary syndrome (NSTEMI-ACS) using 64-slice multidetector computed tomography (MDCT).

Materials and methods. We enrolled in the study 19 patients with NSTEMI-ACS, who underwent 64-MDCT in 1–3 days after ACS onset and 13.4±3.2 months later. We analyzed changes in coronary lesions average density, length, lumen stenosis and MDCT-signs of plaque's vulnerability, such as presence of uneven contour, spotty calcium, "ring-like sign" and positive remodeling.

Results. The average plaque's MDCT-density was the most dynamic index, which have essentially changed in 35 (77.8%) cases. In the majority of them, that consisted 48.9% of all plaques, average density significantly decreased ($p=0.03$). Other quantitative MDCT-characteristics have changed more rarely: the degree of stenosis in 24.4% cases and the plaque's length in 15.5%. The appearance or disappearance of plaque's qualitative unstability MDCT-signs were always combined with changes in the quantitative plaque's characteristics and reflected the basic trend of its changes (stabilization or destabilization). Moreover, our data revealed a significant correlation between the target low density lipid level achievement and decrease in the number of plaques with an uneven contour ($r = 0.57$, $p<0.05$). A more intensive lipid-lowering therapy resulted in a greater reduction in the length of plaques ($r = 0.46$, $p<0.05$).

Conclusions. Thus, the MDCT is a relatively safe and effective method to evaluate changes in coronary plaques, that allows to expand its application for the study of the plaques and stenosis dynamics. Personal changes of plaques may be important in cases, where they lead to its stabilization, for example, under the effective statin therapy or destabilization, that could contribute to adverse cardiovascular events.

Keywords: MDCT, atherosclerotic plaque, density, degree of stenosis, length, signs of instability, statins.

Blood levels of proprotein convertase subtilisin/kexin type 9 (pcsk9) in hyper- and hypocholesterolemia

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Abstract

The aim of the study was to investigate proprotein convertase subtilisin/kexin type 9 (PCSK9) in subjects with hypercholesterolemia (HCH), including familial HCH, and with hypocholesterolemia (population subsamples) and search its associations with blood lipids levels. Blood level of PCSK9 was determined by ELISA using the testsystems «Human ProproteinConvertase 9/PCSK9 Immunoassay» (R&D Systems). It was revealed that in HCH, particularly familial HCH, PCSK9 levels in the blood is higher than in hypocholesterolemia, and higher in women than in men. Histogram distribution of PCSK9 in HCH is a non-parametric nature of a median 223ng/ml. Correlation of PCSK9 with total cholesterol (CH), and especially with CH of low-density lipoprotein (LDL) reflects an important role of this protein in the regulation of metabolism of LDL by affecting the receptors to these particles.

Keywords: proprotein convertase subtilisin/kexin type 9, PCSK9, hypercholesterolemia, familial hypercholesterolemia, hypocholesterolemia.

Prognostic value of coronary atherosclerotic plaque characteristics assessed with intravascular ultrasound in patients with acute myocardial infarction and chronic ischemic heart disease

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Abstract

Aim. The aim of the study was to assess the prognostic value detected by intravascular ultrasound virtual histology (VH-IVUS) characteristics of atherosclerotic plaques in the coronary arteries in patients with acute myocardial infarction (AMI) and chronic ischemic heart disease (IHD).

Materials and methods. 70 patients were enrolled: 40 patients with AMI and 40 patients with IHD in the comparing group referred for coronary angiography. Patients underwent coronary angiography and gray-scale and VH-IVUS after percutaneous coronary intervention (PCI) of infarct-related lesion in AMI. Follow-up was 2-years.

Results. Cardiac events in patients with AMI were associated with high level of calcification in atherosclerotic plaques (>6.7%), the instability index – the ratio of necrotic component to the fibrous (>0.38); in patients with IHD – plaque burden (>49%).

Keywords: vulnerable atherosclerotic plaque, acute myocardial infarction, chronic ischemic heart disease, intravascular ultrasound/

Features non-enhanced magnetic resonance imaging in the selection of candidates for radiofrequency denervation of the renal arteries

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Abstract

Aim. To assess the diagnostic ability of a non-contrast MR-angiography (MRA) of renal arteries (RA) during selection of patients for percutaneous denervation of renal arteries.

Methods and Materials. The study included 23 patients with refractory hypertension aged 31 to 75 years. All candidates to the denervation was performed duplex scanning of the renal arteries (Doppler ultrasound), nonenhanced MRA and abdominal aortography selective angiography. Magnetic resonance imaging (MRI) was performed superconducting MRI "Initial Achieva" company Philips (Netherlands) with a magnetic field of 3 Tesla, the system TX. The study was performed with synchronized ECG and respiration. The estimation of the following parameters: – availability of additional renal arteries; – renal arteries diameter; – length of the renal artery (from the mouth to the bifurcation); – presence of significant stenosis of the renal arteries.

Results. Contraindications to denervation were identified in 6 cases (28.5%): 2 patients had significant stenosis of the renal arteries and 4 patients had double blood supply to the kidneys with the small diameter in the additional arteries. Denervation was performed in 15 cases (71.4%), including 3 patients with hemodynamically nonsignificant stenosis. In 2 patients (9.5%) with severe abdominal obesity quality of the MR images did not allow to reliably determine the anatomy of the renal arteries. In all cases the results of MRA were confirmed during interventional aortography. A significant correlation of the results of MRA and aortography in determining the renal arteries size and presence of stenosis was found.

Conclusion. The non-contrast MRA can be applied during complex examination of patients with resistant hypertension before renal arteries denervation procedure.

Keywords: resistant hypertension, radiofrequency renal denervation, renal angiography, non-enhanced magnetic resonance imaging (MRI).

The influence of lipid transport system genes polymorphism combined carriage on lipid parameters in patients with coronary atherosclerosis

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Abstract

Objective. To study features of lipid metabolism according to the combined carriage of «ε4» allele of the ε2/ε3/ε4 apolipoprotein E (APO E) gen polymorphism and of «S2» allele of the SstI apolipoprotein CIII (APO CIII) gen polymorphism in patients with unstable angina (UA) and coronary atherosclerosis.

Material and methods. 141 patients with UA and coronary atherosclerosis and 50 healthy volunteers were observed. Lipids and apolipoproteins were defined on biochemical autoanalyzer «Daytona» (RANDOX, Ireland). ε2/ε3/ε4 polymorphism of APO E gene and SstI polymorphism of APO CIII gene definition was performed by the restriction fragment length polymorphism polymerase chain reaction (RFLP-PCR) method. Coronary angiography was performed using Allura CV-20 (Philips, Netherlands).

Results. While analysing the frequency distribution of «ε4» allele of APO E gene among UA patients, «ε4» allele carriers were observed more often – 87 (61.7%), in comparison with healthy persons – 54 (38.3%) (OR 11.82; 95% CI 4.7–29.6; $\chi^2=34.535$, $p<0.001$). «S2» allele carriers also prevailed – 51 (27.6%), in comparison with healthy volunteers – 9 (18%) (OR 2.58; 95% CI 1.161–5.740, $\chi^2=4.844$, $p<0.05$). In this connection all patients have been divided into 2 groups: 37 patients (26.2%, I group) with a combination of «damaging» «ε4» and «S2» alleles against

the others – 104 patients (73.8%, II group). In I group of patients total cholesterol (TC) (238.0 ± 54.3) and low density cholesterol (LDL-C) levels (154.7 ± 51.5) were higher, than in the II group (220.6 ± 39.8 and 154.7 ± 51.5 , $p < 0.05$), accordingly. Simultaneously, in I group of patients there was a significantly lower value of high density cholesterol (HDL-C) level (34.1 ± 6.3) in comparison with II group (36.8 ± 6.8 , $p < 0.05$). Apolipoprotein B/apolipoprotein AI ratio at I group (0.9 ± 0.3) was above ($p < 0.05$), concerning II group (0.8 ± 0.2).

Conclusions. Carriage of «ε4» allele of the ε2/ε3/ε4 APO E gen polymorphism and «S2» allele of the SstI APO CIII gen polymorphism is the promoting factor in development of a coronary atherosclerosis and atherogenic dislipidemia among Uzbek patients.

Keywords: lipid transport system genes polymorphism, lipids, apolipoproteins, coronary atherosclerosis.

The relationship of hormones of adipose tissue with lipid and carbohydrate metabolism in men with coronary atherosclerosis

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Abstract

Objective: to study the relationship between hormones of adipose tissue with lipid and carbohydrate metabolism in patients with atherosclerosis and coronary heart disease/

Materials and methods. The study included 86 men, mean age 60.74 ± 8.1 years with angiographically verified coronary atherosclerosis. All the men had carried out the measurement of blood pressure, waist circumference and thighs, weight and height. All patients had a calculated body mass index. For carrying out biochemical analyses all men once in the morning on an empty stomach was performed blood sampling from a vein to obtain serum. All samples determined the concentration of adiponectin, leptin, resistin, total cholesterol, cholesterol high density lipoprotein (HDL cholesterol), cholesterol low-density lipoprotein (LDL cholesterol), triglycerides (TG), apolipoprotein A1 (apoA1), apolipoprotein B (apoB), lipoprotein (a) (LP(a)), glucose, levels of C-peptide and insulin. Statistical processing of results was carried out in the licensed version of the program SPSS (13.0).

Results. In men with coronary atherosclerosis from the study of complex biomarkers in the blood was elevated resistin, LDL cholesterol, TG, apoB, LP(a), C-peptide and reduced HDL cholesterol. When examining the relationship of hormones of adipose tissue with lipid and carbohydrate metabolism there was correlation of adiponectin levels with indicators such as leptin, HDL cholesterol, apoA1, insulin and C-peptide; resistin with apoA1, with apoB; leptin with TG and glucose ($p < 0.01$). When studying the relationship of lipid and carbohydrate metabolism have been identified and the relationship of glucose levels with indicators such as HDL cholesterol, LDL cholesterol and TG ($p < 0.01$) and apoB ($p < 0.05$).

Conclusion. The data obtained indicate the relationship of hormones of adipose tissue with lipid, carbohydrate metabolism and the development of coronary atherosclerosis.

Keywords: atherosclerosis, lipid metabolism, carbohydrate metabolism, adipose tissue hormones.