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ABSTRACTS

Correction of hyperlipidemia: statin treatment at post-marketing the COMPLIANCE study

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Abstract

According to latest data statins are the only lipid-lowering drugs which significantly improve the prognosis of cardiovascular diseases. Using generic statins with lower costs can make medical treatment more available for most of the patients and is directly connected with its effectiveness. To confirm the clinical equivalence of generic version relative to original product, additional postmarketing clinical studies should be organized. The data of the COMPLIANCE study (open-label multicenter observational study of efficacy and safety of generic atorvastatin inpatients with dyslipidemia) to assess the lipid-lowering efficacy, tolerability and safety of generic atorvastatin are ~ given as an example.

Keywords: atorvastatin, generic, statin, postmarketing study.

Features and consequences of coronary artery lesions in Kawasaki disease

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Abstract

Kawasaki disease (KD) is an acute systemic vasculitis with frequent involvement of the coronary arteries, affecting children almost exclusively. Recovered children have already entered adulthood. Cardiologists often face adult patients with distant consequences of KD. The most serious manifestation of KD is the defeat of coronary arteries with the formation of both organic (aneurysms) and functional (endothelial dysfunction) disorders that predispose high likelihood of their stenosis and thrombosis. The review presents information about the nature of coronary arteries — lesions in KD and possible remote consequences of this defeat for adult patients.

Keywords: Kawasaki disease, coronary artery aneurysms, endothelial dysfunction

The influence of coronary angioplasty and stenting on inflammatory biomarkers in Coronary Heart Disease patients

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Abstract

Aim. The objective of our study was to evaluate the impact of coronary angioplasty and stenting on inflammatory biomarkers in stable CHD patients.
Methods. The study included 54 patients who were implanted with 78 drug-eluting stents (drug-eluting stents (DES)). Immediately before and 24 hours after implantation of the stent in the patient's serum were determined: C-reactive protein by highly sensitive method (hsCKP), complement component C3, fibrinogen, ferritin, homocysteine, and the proinflammatory cytokines: tumor necrosis factor — alpha (TNF-a), interleukin-1-alpha (IL-1-a), IL-1f, IL-6, IL-8/NAP-1, endothelin-1 (ET-1).
Results. The median hsCKP concentration after stent implantation was significantly higher than baseline (2.26 (0.75-6.00) and 4.07 (2.14-6.13), p —0.029, respectively, before and after stenting). Increased median fibrinogen concentration with 3.43 (2.89-4.11) to 3.65 (3.33-4.20),p = 0.035 and ferritin with 150.5 (71.8-233.0) to 199.2 (130.1-306.5),p = 0.016. About 25 % of patients had high baseline concentrations of the complement component C3 and homocysteine. The levels of C3 and homocysteine weren't significantly changed after the procedure. DES implantations weren't accompanied by changes in the concentrations of these cytokines (TNF-a, IL-1-a, IL-1f, ILr8/NAP-1, ET-1), except for TL-6 (2.38 (1.48-7.12) and 6.64 (2.98-9.58) p = 0.007, respectively, before and after implantation). Strong positive correlation was revealed between IL-6 and hsCKP (r— 0.74,p — 0.01), indicating an increase in levels of acute phase proteins in response to stimulation of inflammatory cytokine after coronary stenting.
Conclusion. Coronary angioplasty and DES implantation were accompanied by an increase of inflammatory biomarkers (hsCKP, IL-6,ferritin, fibrinogen). Determination of markers of the inflammatory response in DES implantation may be useful to identify patients prone to a higher risk of complications after myocardial revascularisation, as well as for the prevention of ischemic events in the long term.

Keywords: angioplasty, balloon, coronary, C-reactive protein, coronary disease, cytokines, drug-eluting stents, inflammation biological markers.

The interrelation of the basic parameters of calcium and lipid metabolism with atherosclerosis of the coronary arteries

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Abstract

Aim. To examine the relationship between indicators of calcium and lipid metabolism and to assess the impact of these markers on the instability of atherosclerotic lesions in coronary arteries.

Materials and methods. 106 men (46—79years) were divided into control (without coronary heart disease) and main group with angiographically verified coronary atherosclerosis. The main group was divided into 2 subgroups. In the first subgroup were included36 men with stable coronary plaques, in the second group — 40 men with unstable atherosclerotic plaques in the coronary arteries. Serum calcitonin, total cholesterol (TC), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), triglycerides (TG), alkaline phosphatase, calcium, magnesium and phosphorus were determined. Statistical analysis was performed using the licensed version of the SPSS program (13.0).
Results. Patients of the main group had higher levels of calcium (2.4 + 0.0 mmol/l), magnesium (0.8 + 0.0 mmol/l), calcitonin (2.2 + 0.7 pg/ml), alkaline phosphatase (165.9+4.5 U/l) and triglycerides (177.6+15.0 mg/dl), and lower HDL-C levels (34.5+ 1.2 mg/dl). In our study changes of LDL-C and calcitonin levels were associated with the presence of unstable atheroscleroticplaques in coronary arteries. TC levels did notdiffersignificantly between groups. There were correlations between TC and calcium levels (r— 0.402, p — 0.004), TC and LDL-C levels (r— 0.771, p = 0.001) and TC and TG levels (r— 0.262, p — 0.02); a correlation between calcium and LDL-C levels (r=0.380, p—0.004). We found also a relation between phosphorus and TG levels (r— 0.436, p — 0.001) and phosphorus and HDL-C levels (r=—0.280, p = 0.03); a relation between alkaline phosphatase and magnesium levels (r=0.331, p = 0.006). The calcitonin level depended on TG (r=0.433, p = 0.02) and LDL-C (r=0.442, p = 0.02) levels; there was a connection between calcitonin and HDL-C levels also (r=—0.682,p = 0.01).
Conclusion. Our data suggest that there is a link between lipid and calcium metabolism and the development of coronary atherosclerosis andpossibility of atherosclerоticlesions destabili^ation.
Keywords: atherosclerosis, biomarkers, lipids, calcium metabolism, calcitonin.

Plasmalogens in myocardial hypoxia and experimental hypoxia

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Abstract

Aim. To estimate the change in plasmalogen content of red blood cells in experimental hypoxia and myocardial hypoxia.
Materials and methods. In the first study the object was blood samples from patients with coronary heart disease, angina pectoris and coronary atherosclerosis. Control blood samples were from healthy volunteers. In the second study the isolated whole blood samples in healthy volunteers were analysed after incubation at 37°C for180 minutes. In this case the whole blood samples of the same volunteers, not subjected to incubation, were used as the control. Determination of analytes was carried out using the method of capillary gas-liquid chromatography. Results. In the group of patients with coronary heart disease, angina pectoris and coronary atherosclerosis an increase in plasmalogen content of erythrocytes and reducing the pH of the blood plasma were detected compared with healthy volunteers. In case of experimental hypoxia there was an increase in plasmalogen content of erythrocytes and plasma pH decrease in all samples subjected to the incubation.
Conclusion. The data obtained from this study indicates the need for correction of metabolic acidosis as a cause of increase in plasmalogen content of erythrocyte membranes. Based on these data, it is assumed that one of the factors increasing the plasmalogen content in cell membranes is a more significant increase in the activity of calcium-dependent phospholipase A in comparison with the activity of calcium-independent phospholipase A during hypoxia.

Keywords: plasmalogens, red blood cells, hypoxia, acidosis, atherosclerosis, coronary heart disease, anginapectoris.

Clinico-genetical peculiarities of probands with familial hypercholesterolemia and members of their families, observed during 10 years and more

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Abstract

Objective. Previously we have identified mutations of the low density lipoprotein (LDT) receptor in 45 families in St. Petersburg. Aim of the current study was to follow development of dyslipidaemia in children of probands with verified mutations of the LDL receptor gene as these children were growing up; to compare severity of atherosclerotic complications in patients with different LDL receptor gene mutations, and to compare atherosclerotic disease progress in males and females with familial hypercholesterolemia (FH).
Methods. We were following probands with FH and their available relatives with LDL receptor gene mutations, including children, during 10years. In all patients total blood plasma cholesterol, triglycerides, LDL cholesterol and high-density lipoprotein (HDL) cholesterol were monitored and FH clinical manifestations (artery lesions) during progress of the disease were documented.
Results. Due to high heterogeneity of FH-causing mutations in St. Petersburg, wefailed to establish interrelations between type of LDL receptorgene mutation and severity of the atherosclerosis manifestations. As a rule, complications of coronary heart disease arefound less commonly and tend to be less severe in females rather than in males. One possible explanation of these differences may be a higher level of antiatherogenic HDL in FH females compared to FH males. We failed to find evident progression of atherosclerosis in proband's children with LDL receptor gene mutations during period of research.
Conclusions. High level of HDL is the only one proved lipid factor preventing atherosclerosis development in patients with genetically verified familial hypercholesterolemia.
Keywords: mutation, low density lipoprotein, low density lipoprotein receptor,familial hypercholesterolemia, high density lipoproteins, dyslipidaemia, probands with familial hypercholesterolemia.

Analysis of heteroplasmy level in mitochondrial genome mutation m.G15059A of CYTB gene in lypofibrous plaques of human aortic intima

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Abstract

Objective. Mitochondrial mutations are associated with certain human pathologies. Their penetrance and expressivity depend on the heteroplasmy level. Therefore, a quantitative assessment of the mutant allele of mitochondrial genome is necessary in studying the association of mitochondrial mutations with human diseases. The aim of the present study was a pilot heteroplasmy analysis of mutation m.G15059A of CYTB (MT-CYB)gene in lipofibrous plaques and normal human aortic intima. According to the literature, this mutation is associated with mitochondrial myopathy, myoglobinuria, arterial hypertension and some other human pathologies.

Materials and methods. The materials for our study were tissue samples of aortic intima from 7 individuals, who died as a result of an accident or a sudden death. 'Normal aortic intima was compared to lipofibrous plaques. DNA amplificates, containing the region of investigated mutation, were analysed by an original method of quantitative assessment of mitochondrial genome mutant allele, based on pyrosequencing technology. A statistical analysis of the results was performed by a bootstrap analysis.

Results. According to the obtained data, the heteroplasmy level of mitochondrial genome mutation m.G15059A was significantly higher in lipofibrous plaques compared to normal vascular tissue in 43 % aortas. In the rest of the analysed aortas the heteroplasmy level of this mutation in normal and atherosclerotic aortic intima was approximately the same. A correlation analysis, performed by a bootstrap method, revealed that mutation m.G15059A is associated with lipofibrous aortic plaques at the level of significance $p < 0,05$. Taking into consideration that m.G15059A is a nonsense mutation, causing aformation of a terminating codon, which results into a loss of 244 aminoacid residues of cytochrome B, it can be supposed that this genetic defect of respiratory chain enzyme may cause oxidative stress in aortic intima, which leads to local occurrence of human atherosclerotic lesions.

Conclusion. In the present study it is found that somatic mitochondrial genome mutation m.G15059A, localised in gene, coding cytochrome B, is associated with lipofibrous plaques of human aortic intima. This information can be useful forscientists who specialise in studying atherogenesis.

Keywords: mitochondrialgenome, mutation, the heteroplasmy level, aorticintima, lipofibrous plaque, atherosclerosis, gene of cytochrome B.