Streszczenie w języku angielskim

Cardiovascular diseases (CVD) remain the leading cause of mortality and disability in Europe. Epidemiological research demonstrated that CVD are strictly associated with well known risk factors of arteriosclerosis, such as hypertension, diabetes, dyslipidemia, abdominal obesity, physical inactivity, tobacco smoking and psychosocial factors. The probability of arteriosclerosis and cardiovascular events estimated only on the basis of the occurrence of classic cardiovascular risk factors is often insufficient. Therefore, markers which may help in the detection of CVD in the preclinical phase and in the assessment of prognosis in patients with previously diagnosed CVD are sought after. Scientific advances have led to the discovery of a broad range of novel biomarkers associated with cardiovascular risks including galectin-3 (Gal-3) and insulin-like growth factor-binding protein-7 (IGFBP-7).

IGFBP-7

IGFBP-7 is expressed in multiple normal tissues including peripheral nerves, gastrointestinal tract, urinary bladder and prostate as well as breast tissue and specific cell types in kidney, adrenal gland and skeletal muscles. Moreover, this protein is associated with many physiological processes, including cell proliferation, adhesion, senescence, apoptosis and angiogenesis. Compared to other IGFBPs, the affinity of IGFBP-7 to insulin is 500-fold higher. This suggests that IGFBP-7 could compete with insulin receptors for insulin binding and interfere with the physiological response to insulin, contributing to insulin resistance and subsequently to the development of diabetes and CVD. As yet, nothing is known about the role of IGFBP-7 in atherosclerosis.

The objective of this study was to find out the following: whether IGFBP-7 may act as a biomarker of coronary artery disease (CAD) (according to new nomenclature – chronic coronary syndrome (CCS)) occurrence and extent; whether IGFBP-7 is potentially related to the classical and new markers of cardiovascular risk (e.g. carotid intima-media thickness - IMT); whether IGFBP-7 may be a marker of mortality in the group of patients with myocardial infarction (MI).

The study group consisted of 212 patients with MI and 75 patients with stable CAD, the control group included 100 healthy volunteers. IGFBP-7 serum concentration was measured. IGFBP-7 value was considerably higher in the study group (MI and CAD patients: 35.1 ng/ml (p=0.000001) and 32.7 ng/ml (p=0.0001), respectively) than in the controls (25.2 ng/ml). No statistically significant differences between IGFBP-7 concentrations in the MI and CAD group were found. No relationship between IGFBP-7 and the coronary lesions advancement in the study group was observed. No changes in IGFBP-7 concentration in the MI patients during hospitalization were observed. Considerably higher IMT values were found in the group of MI patients who died during follow-up compared to survivors, whereas no statistically significant difference was observed in relation to IGFBP-7 (34.6 vs. 35.2 ng/ml, p=NS).

Conclusions:
-        IGFBP-7 is a good biomarker of CAD occurrence (both chronic and acute form) but   not of coronary lesions advancement in coronary angiography.
-        IGFBP-7 concentration positively correlates with the selected classical risk factors of cardiovascular events as well as with IMT values.
-        IGFBP-7 cannot serve as a marker of acute ischemia and as a predictor of mortality in   the MI patients.

Gal-3

Gal-3 is a macrophage- and endothelium-derived mediator actively involved in the regulation of many aspects of inflammatory cell behaviour. Gal-3 is a molecule well-known in cancer, in the vascular system associated with inflammation, venous diseases and cardiac fibrosis in patients with heart failure (HF). A higher concentration of Gal-3 is associated with an increased risk for HF incident and mortality. Some results suggest that Gal-3 production is involved in the developmental process of CAD. The role of Gal-3 as a prognostic marker during long-term follow up in patients after MI is still debatable.

The aim of the study was to analyse whether the Gal-3 concentration assessed during at least a 24-month period following MI has any prognostic value, and whether it reflects the progression of atherosclerosis and correlates with IMT and the presence of atheromatous plaque in carotid arteries in the group of patients with a history of MI during long-term observation.

The analysis included 110 patients who were hospitalized due to acute MI, treated with primary coronary intervention (PCI) and further attended a follow-up visit, and 100 healthy volunteers. The Gal-3 concentration and carotid ultrasound were evaluated at baseline and on a follow-up visit. I found that the Gal-3 concentration in the group with hyperlipidemia decreased during the observation (10.7 vs. 7.9 ng/ml, p=0.00003). Patients rehospitalized during follow up had higher concentration of Gal-3 in the acute phase of MI compared to non-hospitalized (10.7 vs. 7.2 ng/ml, p=0.02; 10.1 vs. 8.0 ng/ml, p=0.002, respectively). In the group of patients who had none of the following endpoints: subsequent MI, PCI, coronary artery bypass grafting (CABG) or stroke, there was a decrease in Gal-3 concentration at the follow-up visit. Parameters affecting the frequency of a composite endpoint occurrence are: the presence of atheromatous plaque in the carotid artery (p=0.017), Gal-3 (p=0.004) and haemoglobin concentration (p=0.03). In multivariate analysis, only Gal-3 concentration higher than 9.2 ng/ml at discharge was associated with a nine-fold increase in the risk of composite endpoint occurrence (p=0.0005, OR=9.47, 95% CI=2.60–34.45). A significant decrease in Gal-3 concentration was observed in the group of patients after acute MI without the endpoint occurrence during observation.

Conclusions:
-        A significant decrease in the Gal-3 concentration was observed in the group of patients after MI, who had no endpoints such as subsequent MI, re-PCI, CABG or stroke during   the long-term observation.
-        A decrease in the Gal-3 concentration in the follow-up correlated with a significant regression of the atherosclerotic plaques in carotid arteries observed in   ultrasonography.
-        The multivariate analysis revealed that only Gal-3 concentration higher than 9.2 ng/ml   at discharge was associated with the risk of composite endpoint occurrence during the   long   term follow-up in the patients after MI.