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ASSESSMENT OF PENTRAXIN-3 AND ENDOCAN AS PREDICTORS OF SHORT- AND LONG-TERM OUTCOMES OF CARDIAC REHABILITATION AFTER CABG.

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Introduction. It has been proven that cardiac rehabilitation (CR) improves short-, mid- and long-term outcomes after CABG. Pentraxin-3 (PTX-3) is a parameter indicating cardiovascular damage and vascular inflammation. It predicts cardiac rehabilitation outcome after cardiac surgery. Some research suggested CR decreases PTX-3 in patients with cardiovascular diseases. Endocan is a novel endothelial marker of inflammation. Its elevated levels associate with cardiological conditions and vascular diseases.

Aim: was to present background information concerning pentraxin-3 and endocan, to establish whether cardiac rehabilitation impacts pentraxin-3 and endocan levels in patients after CABG, to prove associations between PTX-3 or endocan and other clinical variables, to verify if PTX-3 and endocan may predict long-term outcomes of CR after CABG.

Materials and methods. The prospective study enrolled fifty one patients after coronary artery by-pass grafting (CABG) who underwent 3- to 5-week long inpatient cardiac rehabilitation [65 ± 8 (mean ± SD) years old, male/female 41/10]. CR included: walking training 6 times/week, interval training with cycle- ergometer or treadmill 5 times/week and respiratory exercises. Several laboratory markers such as C-reactive protein (hsCRP), brain natriuretic peptide (BNP), pentraxin-3 (PTX-3) and endocan as well as ejection fraction (LVEF) and metabolic equivalents (METs) were assessed on a day of admission and a day before discharge. Three years after the rehabilitation a survey follow up research was conducted. The data concerning patients survival and hospitalizations was gathered. Patients' functional status was also assessed with NYHA classification.

Results and discussion. Exercise tolerance increased during CR (METs from 4,43 ± 0,83 to 5,59 ± 1,52; $p<0.0001$). CR remarkably reduced BNP (from 895 ± 939; to 632 ± 635 pg/ml; $p<0,05$) and CRP (from 6,11 ± 6,3; to 4,55 ± 6,2 mg/l; $p<0,05$). However, changes of plasma levels of PTX-3 and endocan in the entire study population after CR were not statistically significant. Based on the literature, PTX-3 and endocan seem to be very promising markers of inflammation in cardiovascular system. However, CR in patients after CABG has a slight impact on PTX-3 and endocan levels There was a low negative correlation between weight and PTX-3 at baseline ($r=(-0,32)$; $p<0,05$). Patients with hypertension had lower PTX-3 levels (at baseline $r=-0,32$; after CR ($r=(-0,37)$; $p<0,05$). Follow-up study revealed that there were no deaths in the study population, therefore survival was 100%. Three years after CR fourteen out of fifty-one patients (27,45%) were hospitalised at least once. Eight out of fifty-one patients (15,69%) were hospitalised due to cardiovascular conditions. There is a positive correlation between baseline PTX-3 level and a number of hospital admissions ($R=0,39$; $p<0,05$) as well as between baseline PTX-3 level and a number of hospital admissions due to cardiovascular conditions ($R= 0,46$; $p<0.05$).

Conclusion. Cardiac rehabilitation increases exercise tolerance in patients after CABG. CR reduces BNP and CRP in patients after CABG. PTX-3 and endocan have very limited prognostic value in patients undergoing CR after CABG. Higher PTX-3 levels are associated with greater risk of hospitalization in patients after CABG. It is crucial to understand that further long-term research on larger populations need to be conducted in order to establish PTX-3 and endocan role in patients undergoing CR after CABG.