SUMMARY (LONG PENTRAXIN 3 – A PUTATIVE BIOMARKER WITH PREDICTIVE VALUE TO IDENTIFY THE ADVERSE INFLAMMATORY RESPONSE IN CARDIAC SURGICAL PATIENTS?)

INTRODUCTION. Cardiac surgery is well established for development of systemic inflammatory response. There are still no biomarkers with significant predictive value to identify patients at risk.

AIM. The aim of this study was to compare the dynamics of pentraxin 3 (PTX3) and other inflammatory biomarkers (CRP, TLR2 and IL-8) after cardiac surgery with particular regards to different postoperative clinical manifestation of inflammatory response. Furthermore to evaluate the association between perioperative inflammatory biomarkers (PTX3, CRP, IL-8, IL-18, IL-18BP, TLR2, MMP7, MMP8, sFas a sFasL) and atrial fibrillation (AF) in cardiosurgical patients.

METHODS. Forty-two patients undergoing open heart surgery with the use of cardiopulmonary bypass were included in the study and divided in 2 groups according to the extent of clinical manifestation of inflammatory response: Group A ($n = 21$) – patients with different severity of systemic inflammatory response syndrome (SIRS) and Group B ($n = 21$) – patients with uneventful postoperative period (no SIRS). The same group of 42 patient were divided in 3 groups according to occurrence of atrial fibrillation (AF): Group A ($n = 22$) – patients with no AF, Group B ($n = 11$) – patients with new onset AF postoperatively and Group C ($n = 9$) – patients with preoperative history of AF. The serum levels of PTX3 and all others biomarkers were measured at following time points: before surgery, immediately and 6 h after surgery and on the 1st, 3rd and 7th postoperative day (POD).

RESULTS. The dynamics of PTX3 showed an earlier increase of serum levels with the peak on the 1st postoperative day in both groups divided due to different severity of SIRS (36.3 ng/ml vs 42.7 ng/ml). Importantly, a significant difference of PTX3 levels was found on the 3rd postoperative day (31.1 ng/ml vs 7.0 ng/ml; $p < 0.006$) between the two groups showing significantly delayed decrease of PTX3 levels in patients with SIRS (group A). The dynamics of CRP, TLR2 and IL-8 levels were comparable between both groups, showing no statistical differences. In study regarding occurrence of atrial fibrillation serum levels of PTX3 showed a difference between the Group A and C on 3rd POD ($p < 0.050$) and on 7th POD ($p < 0.0001$). IL-8 levels were different between Group A and C immediately after surgery ($p < 0.050$), 6 hours after surgery ($p < 0.050$) and on 3rd POD ($p < 0.05$). There was a difference between Group B and C on 1st POD in IL-8 levels ($p < 0.05$). The sFAS levels differed between group A and C on 3rd POD ($p < 0.010$) and 7th POD ($p < 0.050$). There was also difference on the 7th POD ($p < 0.050$) between the Group B and C. No significant differences of other biomarkers were seen between the groups.

CONCLUSIONS. The study demonstrates significantly different dynamics of PTX3 levels after cardiac surgery in patients with SIRS and patients without SIRS, thus it may beindicative to start the appropriate therapy. The study regarding occurrence of atrial fibrillation demonstrates significantly different dynamics of PTX3, IL-8 and sFas levels after cardiac surgery. Further studies with larger number of patients and ideally shorter periods between blood sampling are needed to elucidate the real predictive value of pentraxin 3.