

The role of cholesterol, its precursors and oxidative products in clinically serious conditions

Objective: The aim of the study was to elucidate the role and importance of hypocholesterolemia in clinically serious conditions. It was a monocentric, prospective clinical study.

Material and Methods: Two groups of patients were recruited into the study – one group consisted of patients with coronary heart disease (CHD), who underwent miniinvasive cardiosurgical operation without extracorporeal circulation (n=22) and the other group of patients, who sustained polytrauma (n=31). Fifty three patients were recruited into the study. We performed the determination of sterols (total cholesterol, HDL cholesterol, LDL cholesterol, triacylglycerols) and their precursors (β -sitosterol, campesterol, lathosterol, skvalen), interleukin IL-6, insulin, C-peptid and cortisol in the blood serum. The short version of ACTH stimulation test was performed. The oxidative burst of granulocytes was evaluated. The blood samples were taken on the day of admission, the first, the fourth and the eighth post-operative and post-traumatic day.

Results: There was a significant early decline of total cholesterol (TC) and LDL cholesterol level followed by full recovery during observed period. There was a decline of cholesterol synthesis (lathosterol and lathosterol/cholesterol ratio) together with a decline of total cholesterol level. There was a significantly negative correlation between IL-6 level and total cholesterol. There was no confirmation of disturbance of adrenal function. There was a significant breakdown of bactericidal function of granulocytes along with a decline of cholesterol level.

Conclusion: There was a decline of endogenous cholesterol synthesis in clinically serious conditions. The cholesterol synthesis rate was in negative correlation with IL-6 level. The rate of endogenous cholesterol synthesis was dependent on severity of illness. The rate of endogenous cholesterol synthesis positively correlated with bactericidal function of granulocytes.

Key words: hypocholesterolemia, hypolipoproteinemia, SIRS, cytokine, cardiosurgery