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Visceral obesity and cytokines in patients with unfavorable cardiovascular prognosis of myocardial infarction

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Aim: To study the relationships between key inflammatory factors and complications in the late post myocardial infarction period in patients with visceral obesity.

Methods: The study recruited 232 male patients with ST-elevated myocardial infarction (MI). All the patients were assigned to two groups: Group one had 160 patients with visceral obesity (VO) and group two had 72 patients without VO. Interleukins were measured in blood serum on day one and on day 12 after MI. All patients with MI demonstrated elevated levels of pro-inflammatory markers and reduced anti-inflammatory markers in the in-hospital period. The study design was approved by the local Ethics Committee of the Research Institute. The statistical analysis was performed using Statistica 6.1, and SPSS 17.0.

Results: In-hospital revealed elevated levels of pro-inflammatory markers (TNF-α, IL1β, IL6, IL8, IL-12 and CRP) and reduced anti-inflammatory (IL-10), but in the presence of VO data changes were more pronounced throughout the observation. So, the level of TNF-α and IL-1β patients with VO on day one of MI exceeded the value of stateless VO 1.2 and 1.6-fold, respectively. By the day 12, the level of TNF-α increased in 1.4-fold, and IL-1β not changed. The level of IL-12 on day one was increased relative to a control group of patients with a VO 2.1-fold, and without VO 1.6-fold, and IL-12 in patients with VO concentration was above 1.3-fold higher than in those without VO. The level of IL-6 in patients with VO on the day one of MI was increased in 6.9 and 1.5-fold compared to the control and stateless VO, to day 12 was a reduction in its concentration. In patients with VO level, IL-6 values were greater than patients without VO 1.6-fold. IL-8 levels in patients with VO group on the day one. Day 12 IL-8 increased to 24.2 and 20.1-fold, and was significantly higher than patients without VO. For patients with VO on the day one of MI showed increase in the 23.2-fold CRP levels compared to the control and reduction of the day 12. On day 12 patients without VO, CRP increased 7.7-fold compared with the control. On day one in patients with VO, IL-10 levels were decreased relative to controls at 78%, while in the group without VO decline was 37%. On day 12, there was an increase in IL-10 in both patient groups two and 1.4-fold, but in patients with VO, IL-10 level remained below two-fold compared with patients without VO. Using logistic regression analysis, it was found that out of all the studied inflammatory markers most closely connected with the presence of VO had IL-6 [OR 1.9; 95% CI (1.6-2.8)] and CRP [OR: 1 3; 95% CI (1.1-1.8)]. The highest predictive value in relation to the risk of adverse cardiovascular events in patients with VO had IL-6 [OR: 1.9; 95% CI (1.5-2.1)], IL-12 [OR: 1.3; 95% CI (1.1-2.0)] and IL-10 [OR: 0.8; 95% CI (0.5-0.9)].

Conclusion: Cytokine in MI patients with VO is characterized by an imbalance caused by elevated pro-inflammatory interleukins and decreased anti-inflammatory interleukins. Dynamics of changes in the concentrations of IL-6, IL-12 and IL-10 is essential for the development of adverse cardiovascular events one year after MI.

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