

Cytokine Status in Game Sports Athletes with Cardiomyopathy of Overstrain

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ABSTRACT

Cytokines are the group of the hormone - like peptides and proteins, which are synthesized and secreted by immune cells. These molecules have an enormous influence on biochemical processes in organisms taking part in inflammation, differentiation and cell maturation. Imbalance of cytokines may be the cause of pathological changes in different systems of organs.

Keywords: Cytokines; Cardiomyopathy of overstrain; Sport

Introduction

The regular intensive physical psycho-emotional loads are characteristic for modern sport. They lead to organism's changes that affect most organs, systems and biochemical processes. The cardiovascular system is most affected [1,2]. Imbalance in cytokine status have a significant role in pathological changes in cardiovascular system. Pro-inflammatory cytokines are markers not only of risk of atherosclerosis, but also indicators of overstrain of heart during the inadequate physical loads [3,4].

Results

Comparing athletes without cardiovascular pathology and sportsmen with process of repolarization disruption (PRD) of 2-3 stages it is revealed that level of pro-inflammatory IL-1 β and IL-8 is higher in the last ones ($52,1 \pm 14,0$ and $16,6 \pm 2,5$ pg/ml against $296,3 \pm 111,1$ and $110,8 \pm 33,0$ pg/ml at $p < 0,05 - 0,01$). The lowest level of anti-inflammatory IL-4 is also registered in athletes with PRD ($2,0 \pm 1,0$ against $7,1 \pm 2,3$ pg/ml at $p < 0,05$). All defined interleukins, including IL-8 (in the united group it was isolated), in sportsmen with electrocardiographic signs of cardiomyopathy of overstrain (PRD and rhythm disturbance) are linked by positive correlation (r from 0,58 to 0,98). TNF- α , IL-1 β ,

IL-4 have also a positive correlation (r from 0,42 to 0,61) with CPK-MB what indicates not only a connection TNF- α and IL- β with destruction of the cardiomyocytes, but also compensatory rising of anti-inflammatory IL-4. The most significant correlation is revealed between TNF- α and CPK-MB ($r = 0,61$). It confirms opinion about role of TNF- α in progress of myocardial dysfunction [5,6].

Conclusion

In research it is found that athletes with signs of myocardial dystrophy regarding sportsmen without cardiovascular pathology have a high level of IL-1 β and IL-8. Substantial correlation ($r = 0,61$) between TNF- α and CPK-MB in athletes with myocardial dystrophy of overstrain confirms the role of TNF- α in progress of myocardial dysfunction. The most severe problems are found in sportsmen with myocardial dystrophy of overstrain are detected on ECG (PRD of 2-3 stages).

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