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Effect of endurance training on liver NK cells in mice

Zhe Wang, Ning Jiang, Xinghao Wang, Jing Li
Tianjin University of Sport

Objective NK cell (natural killer cell) is a large granular lymphocyte distinct from a group of T and B lymphocytes. At present, the research shows that NK cells can specifically identify target cells and release killing media and then play a killing effect. It is confirmed that the expression of IL-15 is closely related to the differentiation and maturation of NK cells. Furthermore, skeletal muscle is an endocrine tissue and plays a key role in regulating the whole-body metabolic health by synthesizing and releasing humoral factors called myokines, such as IL-15. Whether the IL-15 induced by exercise training can promote the maturation of NK cells remain unsolved. This study aimed to explore the effects of moderate endurance training on NK cells and relative mechanism.

Methods Twenty male C57BL/6J mice were randomly divided into 2 groups: control group (YC) and exercise group (YE). YC animals were fed normally for 12 weeks, YE animals were trained for 12 weeks on moderate intensity treadmill (12 m/min). Then the samples were isolated and RT-PCR was used to detect IL-15 and Nkg2d genes in the liver, Western blotting was used to detect the killer factor IFN- γ released by NK cells. Flow cytometry was used to detect NK1.1 cell markers in primary liver cells.

Results 1) Compared with the YC group, the expression level of IL-15 and Nkg2d gene in the liver tissue of YE mice increased significantly ($P < 0.05$, $P < 0.01$); 2) Compared with the YC group, the expression of IFN- γ protein in the liver tissue of the YE mice increased significantly ($P < 0.05$); 3) Compared with two group. The proportion of NK cells in liver cells of group YE increased significantly ($P < 0.05$).

Conclusions Moderate intensity endurance training can enhance the content and killing ability of NK cells through induced IL-15 in the liver.