Exercise Biochemistry Review

Proceedings of IBEC 2018, Beijing, China, October 23-25
PO-155

Comparison of effects of different exercise modes on rat gastrocnemius muscle

Xiujuan Liu,Nianyun Zhang
Nanjing Sports Institute

Objective To explore the effects of different exercise patterns on gastrocnemius weight.
Methods Forty-eight SD rats were randomly divided into 4 groups, which were quiet control group (Con), continuous exercise group (CE), high-intensity intermittent exercise group (HIIT) and ladder exercise group (LE). After 8 weeks of exercise training, each group was anesthetized and samples were collected for testing. The body weight and gastrocnemius weight of each group were recorded. The cross-sectional area (CSA) of gastrocnemius muscle was observed by HE staining. The levels of MSTN and insulin in serum were detected by ELISA. The expressions of MSTN, IGF1 and p70S6K in rat gastrocnemius muscle were detected by Western blot.
Results *Compared with group Con, the body weights of the three exercise groups were significantly lower, and the weight of the gastrocnemius muscles in group CE was significantly lower. Morphological observation of gastrocnemius showed that the cross-sectional area of the gastrocnemius muscle in group CE was significantly decreased, compared with group Con, and the cross-sectional area of the gastrocnemius muscle in group LE was significantly increased. There was no significant change in the cross-sectional area of the gastrocnemius muscle in group HIIT. The ELISA results showed that serum GDF8 levels were significantly decreased in the three exercise groups compared with group Con, while the insulin levels were not significantly changed. Compared with group Con, the expression of GDF8 protein in the gastrocnemius muscle of the group LE was significantly decreased, while the protein expression of IGF1 and P70S6K was significantly increased. The protein expression of the gastrocnemius P70S6K in group CE was also significantly increased.*
Conclusions Although the three exercise modes can significantly reduce the body weight of rats, only HIIT and LE improve the gastrocnemius muscle mass index. CE significantly reduced the body weight and cross-sectional area of the gastrocnemius muscle. Although the protein expression of P70S6K was increased, there was no significant effect on the protein expression of GDF8 and IGF1. Ladder movement may increase the gastrocnemius cross-sectional area by reducing MSTN and increasing protein expression of IGF1 and P70S6K.