Effect of HIIT on mitochondrial telomerase of skeletal muscle in aged rats

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Objective The HIIT and moderate-intensity exercise are two different exercise models among the public fitness. In recent years, HIIT become more and more popular, unfortunately, there is a tremendous lack of research being done effects of mitochondrial reverse transcriptase (TERT) on age-related degeneration of skeletal muscle by HIIT. The purpose of this study was to compare the HIIT group and moderate-intensity group, and research difference of telomerase expression and cardiopulmonary endurance between the exercise group and the quiet control group was discussed.

Methods Fifty-nine male Wistar rats were divided into three groups at random: control group (Q=19), moderate-intensity intervention group (M=20), and HIIT intervention group (H=20). The rats in Q group did not any exercise, and the rats in M group developed the exercise with 60% VO2max intensity for 8 weeks. H group did a training program for an 8-week exercise with alternating 40%, 60%, and 80% VO2max intensities. The rats in the experimental group were exercised for 50 minutes every day and trained for 5 days per week. After the baseline value group was sampled, each group of rats was selected after the training reached the specified number of weeks (4 and 8 weeks), and the maximum oxygen uptake test was performed before the material was taken. Single factor analysis of variance were used to assess differences in VO2max, and expression of protein between conditions.

Results It was found that H group VO2max was significantly higher than M group and Q group (P<0.05). At same time, the mTERT expression of the M group at the 4th week was significantly higher than that of the Q group (P<0.05). The mTERT expression in group H was significantly higher than that in group Q at week 8 (P<0.05). There was no significant difference between the H group and the Q group at 8th week (P<0.05).

Conclusions 1. HIIT exercise lasting for 8 weeks can effectively inhibit the decrease of maximal oxygen uptake in aging rats compared with moderate exercise. 2. HIIT training for 8 weeks promotes the expression of mTERT; 3. The maintenance of VO2max in aging rats may be related to the enhancement of mitochondrial antioxidant function by HIIT-promoted TERT to mitochondrial translocation.