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EFFECTS OF EXERCISE CAPACITY BETWEEN SHORT-TERM HIGH INTENSITY INTERVAL EXERCISE AND MODERATE INTENSITY CONTINUOUS EXERCISE TRAINING IN YOUNG MALES

Liang Qi, Jiao Rui, Jiang Qin, Chen Yili, Wu Guifu, Ding Jianxin *The First Affiliated Hospital of Sun Yat-Sen University, Guangdong, China*

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Purpose The present study aimed to examine the effects of short-term high intensity interval exercise training compared with moderate intensity continuous training, on exercise capacity of physically inactive young males. It was hypothesized that short-term high intensity interval exercise training would elicit higher degree of exercise capacity which compared with moderate intensity continuous training. The findings will provide better understanding of the protocol design of high intensity interval exercise training.

Methods Nineteen physically inactive young male volunteers (age from 18 to 30) were randomly assigned to three groups: high intensity interval training (HIT, n=6), moderate intensity continuous training (CMT, n=7) and no training control (CON, n=6) group. Participants with present or past history of cardiac diseases, hypertension, diabetes, medication, smoking etc. were excluded. Ethical approval was received from the Human Research Ethics Committee of the First Affiliated Hospital of Sun Yat-sen University. The training was conducted on a same treadmill Noramco ST4600HRT (Noramco Inc. Athens, GA, USA) within 2 weeks with 1–2 days rest between sessions. The volunteers of HIT group completed six session exercise training including six sets of 1 min of treadmill exercise at 100% of VO_2 max separated by 1 min of recovery. The volunteers of CMT performed six sessions of moderate exercise training including six sets of 20 min continuous treadmill exercise at 60% of VO_2 max. A maximal exercise treadmill test of Bruce protocol was carried out in the afternoon in Marquette Case 8000 system (GE, USA) 3 days before and after training. The maximal workload (METs) and the total exercise time (s) were measured during exercise test and analysed.

Results The statistical analysis was computed using SPSS version 17 statistical package (SPSS Inc. Chicago, IL, USA). In HIT group, the total training time was 72 min and that of the CMT was 120 min. Statistical comparison among three groups using paired t test to compare the differences for METs and total exercise time. The results indicated that the maximal workload (METs) of HIT group increased significantly from 14.1±1.7 to 15.0±1.3 (METs) ($p<0.05$), and the total exercise time was prolonged from 717±82 to 784±49 s after training ($p<0.01$). CMT increased total exercise time from 672±95 to 714±105 s, $p<0.05$ but had no significant effect for maximal workload. One way ANOVA was performed to examine the effects between groups. There was a significant difference between HIT and CON groups for maximal workload and total exercise time after training but no significant difference between CMT and CON groups for all variables.

Conclusion The results showed that regular short term high intensity interval training on treadmill increases the exercise capacity of physical inactivity young males and is more effective than continuous moderate exercise training. Due to the limitation of experimental design, this current study was not used the VO_2 max as the key parameter. However, METs is one common index of exercise capacity which is convenient to be collected. The training protocol was designed based on the pilot study. Participants also reported higher level of perceived exertion and fatigue. The optimal protocol will be conducted in the next phase of the study.