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ANALYSIS OF DIFFERENT ZERO-G SIMULATION ERGOMETER EXERCISE PROTOCOLS ON
AEROBIC CAPACITY AND ORTHOSTATIC TOLERANCE**Abstract**

Purpose: Endurance training may benefit for aerobic capacity but have little or inverse role on orthostatic tolerance. The effects of exercise protocols and zero-g simulation condition on aerobic and orthostatic capacity were explored to guide the combined exercise protocol application in space flight. **Methods:** To test this hypothesis, 26 males (aged 18 to 34yr) were divided into three groups and underwent 6 weeks of supine or reduced gravity ergometer exercise with high intensity interval training (HIT) or moderate intensity interval training (MIT). Submaximal VO₂peak were measured with supine ergometer and changes of heart rate (HR), blood pressure (BP), stroke volume (SV), total peripheral resistance (TPR) were detected by finger beat by beat hemodynamic response device during tilt table test before and after exercise training. **Results:** Submaximal VO₂peaks were significantly increased about 9.83% to 14.98% in three groups. And exercise in supine position only reached 65.6% increase of submaximal VO₂peaks to exercise in erect position of reduced gravity. After 6 weeks ergometer exercise training, 6 subjects experienced postural orthostatic tachycardia syndrome type variations during tilt table test. At first 5 min tilt standing the HR, at 15min tilt standing the mean BP was dropped but the TPR was increased during the tilt table test after exercise compared with those during tilt table test before exercise. The recovery HR was higher in HIT group than in MIT group. **Conclusion:** Exercise in supine impact the effect of exercise on aerobic capacity. And 6 weeks ergometer training had negative role in orthostatic tolerance and MIT and HIT ratio and training frequency should under control in comprehensive exercise protocol development.