1-B-12 Effect of vitamin C supplementation and training on indices of carbohydrate and lipid metabolism in rats.

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Purpose : Recently, it has been suggested that reactive oxygen species(ROS) produced during exercise may act as signaling substances for health promotion. The purpose of this study was to determine whether large dose of vitamin C supplementation inhibited the training-induced improvement of carbohydrate and lipid metabolism in rats.

Methods : Twenty-eight SD rats were assigned to four groups : sedentary control, sedentary vitamin C, training control, training vitamin C (n=7 in each). The rats of the training groups were subjected to swimming six hours a day for ten days. The vitamin C supplemented groups were administered 500mg of vitamin C per kg body weight from 15 days before the start of training until the end of training.

Results and Discussion : Neither training nor vitamin C had no significant effect on blood glucose levels. Training significantly lowered the blood insulin concentration and HOMA-IR. There were significant interaction between training and vitamin C for HOMA-IR. Training significantly lowered the blood triglyceride level. However, vitamin C significantly raised it. There was significant interaction between training and vitamin C for the blood triglyceride. This study suggest that the overdose of vitamin C without training may worsen insulin resistance and lipid metabolism.

Key Words : carbohydrate metabolism, lipid metabolism, vitamin C, training, rat

1-B-13 A method for measuring dynamic balance ability quantitatively, and its application

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Purpose: The purpose of this study was to try to measure the dynamic balance ability quantitatively and next, to compare the sex differences in its ability.

Methods: Eighty college students (males = 40, females = 40) participated in the dynamic balance test. They were asked to maintain standing posture barefoot on an unstable seesaw-like platform as long as they could and to perform 10 trails of balance testing. The platform was custom-made for obtaining the balance keeping time (BKT) and changes in the angular velocity (deg/s) from side to side directions. We set the platform horizontally at an angle of zero degree as a base, and the maximum inclination angle of the platform was set at 20 degrees. We used a high speed digital video camera (SONY-HDR-CX520V) capturing the motion of changes in degrees from the bilateral balance plates, and analyzed the changes in the angular velocity by root-mean-square (RMS). The statistical difference between the males and females was determined by independent sample t-test, and Pearson's correlation coefficient analysis was also used to assess the relationship between the BKT and the RMS of angular velocity. The level of significance was set at $\alpha = 0.05$ for the test.

Results: The experimental results showed that the BKT and the RMS of angular velocity of the male group (2.471 ± 0.115 sec, 35.091 ± 8.873 deg/s) were significantly higher than those of the female group (1.919 ± 0.742 sec, 26.741 ± 5.232 deg/s). In addition, the correlation analysis for the BKT and the RMS of angular velocity in male (r = 0.507) and in female (r = 0.578) group revealed positively significant relationship in each group.

Conclusions: These findings indicate that the instability platform system may be an appropriate instrument for collecting the data of BKT and the RMS of angular velocity effectively. Moreover, the data gained from the experiments may establish the dynamic balance fitness norm and can be used as an assessment method of the lower extremity coordination ability.

Key words: Dynamic balance, BKT, Angular velocity