P-15 Weighting adjustment and timing control of load balance among upper and lower limbs in a lateral body weight-shifting task

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Purpose: This study examined the characteristics of weighting adjustment of load balance and its timing control among the upper and lower limbs in a lateral body weight-shifting task, which is usually used in rehabilitation. To this end, we measured the respective weighted loads on the 4 limbs, likely inter-limb coordination, and the weighting timing of the 4 limbs.

Methods: Twenty-three healthy participants performed a 3-sec lateral body weight-shifting task under 4 conditions: 2 target amounts (one- and two-third of the body weight) in 2 weight-shifting directions (left and right). They were allowed to use light touch support with their upper limbs placed on a pair of horizontal parallel bars. Adjustments of loads in inter-limb coordination were analyzed in terms of inter-limb correlation coefficients and then the relationships between the accuracy (constant errors) of load adjustments on the target lower limb. The timing of load adjustments among the 4 limbs was also analyzed by a 3-way ANOVA.

Results and Discussion: Our results showed that the inter-limb coordination may impede the adjustment accuracy of target load balance between the 2 lower limbs, although this was the case for the leftward shifting condition alone. Our results also showed that the light touch support by the upper limbs often occurred initially in the opposite side of the target lower limb, suggesting that the upper limb opposite to the target lower limb may be initially used in adjusting load balance between the 2 lower limbs.

Key Words: inter-limb coordination, timing, a lateral body weight-shifting task

P-16 Effect of Low Intensity Exercise on Metabolic Activity of Skeletal Muscle in Type II Diabetic Rats

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Purpose: The purpose of the present study was to investigate the effects of low intensity exercise on the metabolic activity in diabetic rats skeletal muscles.

Methods: Eleven-week-old male Spontaneously Diabetic Torii rats were used as type 2 diabetic animal (DB) and age-matched male Sprague-Dawley rats were used as non-diabetic animal (SD). All rats were assigned to non-exercise and exercise groups. The rats in exercise groups (SDEx and DBEx) ran on treadmill for 1 h a day, 5 times a week.

Results and Discussion: At 25 weeks of age, glucose and HbA1c levels were significantly higher in the DB group than in the SD group. In contrast, these levels were significantly lower in the DBEx group than in the DB group. For the cross sectional area and SDH activity of the muscle fiber in the gastrocnemius muscle, although the values in the DB group were significantly lower than those in the SD group, the values in the DBEx group were significantly higher than those in the DB group. These results suggested that the aerobic exercise could counteract the possible changes that appeared in skeletal muscle of type 2 diabetic.

Key words: type II diabetes, skeletal muscle, low intensity exercise