

THE STUDY ON THE RELATIONSHIP BETWEEN SALT INTAKE AND EXERCISE

Yoshiharu Shimomura¹, Goro Okano², and Yuji Sato³

¹Institute of Health and Sport Sciences, University of Tsukuba

²Department of Health and Physical Education, Sapporo Medical College

³Department of Health and Physical Education, Saitama College of Health

Summary

Many studies have been reported concerning the effect of salt intake on physiological functions. However, attention has been little payed on the relationship between salt intake and exercise. In the present study, the effects of exercise on mineral excretion in urine and on liver and muscle glycogen contents have been investigated in rats fed a low-salt diet or a high-salt diet.

As reported previously, calcium excretion in urine was greater in rats fed the high-salt diet than in the animals fed the low-salt diet. However, this effect of high-salt diet was not observed in rats trained by voluntary exercise, suggesting that exercise decreases the calcium excretion in urine by promoting calcium utilization in the body. The voluntary exercise activity was slightly higher in rats fed the high-salt diet than in the animals fed the low-salt diet. It has been reported that the tissue glycogen content is related with endurance physical performance. In this study, there is a trend that the glycogen content in liver was greater in exercised rats fed the high-salt diet than in the animals fed the low-salt diet. The glycogen content in soleus muscle appeared to be greater in sedentary rats fed the high-salt diet than in the animals fed the low-salt diet. Although further study is required to confirm these findings, it is suggested that salt intake affects glycogen metabolism in liver and muscle.

The nutritional levels and physical training requirements were surveyed in adolescent Japanese and Chinese athletes whose abilities were highly outstanding in track and field and basketball in their own country. As a result of comparison between two countries, the Japanese athletes was under the inferior conditions with respect to nutrient intakes and physical training requirements compared to the Chinese athletes. Interestingly, the salt intake was markedly low in the Chinese athletes than in the Japanese. Further study is required to clarify the relationship between salt intake and physical performance in these athletes.