Original Article

Reevaluation of exercise-induced transient hypoglycemia: a comparison with the resting condition

Saki KONDO [*1, *2], Kumpei TANISAWA [*3, *4, *5], Katsuhiko SUZUKI [*3], Shin TERADA [*2], Mitsuru HIGUCHI [*3]

[*1] Graduate School of Sport Sciences, Waseda University
[*2] Department of Life Sciences, Graduate School of Arts and Sciences, The University of Tokyo
[*3] Faculty of Sport Sciences, Waseda University
[*4] Department of Physical Activity Research, National Institutes of Biomedical Innovation, Health and Nutrition
[*5] Research Fellow of Japan Society for the Promotion of Science

ABSTRACT

【Aim】
Carbohydrate (CHO) ingestion 30–45 min before exercise results in transient hypoglycemia after the start of exercise. Although the phenomenon is called exercise-induced hypoglycemia, no comparisons have been performed between exercise and resting conditions. This study aimed to reevaluate exercise-induced transient hypoglycemia by comparing it with the resting condition.

【Methods】
Fifteen subjects were involved in the following two trials: 1) subjects performed cycle ergometer exercises for 60 minutes at 75% maximal oxygen uptake ($\dot{V}O_2$max) (EX trails), and 2) subjects remained at rest for 90 min (REST trial). In both trials, they consumed breakfast and 500 ml of a beverage containing 150 g of glucose at 3 h and 30 min, respectively, before the trial. Plasma glucose levels were then determined.

【Results】
In the EX trial, a sharp decline in plasma glucose was observed at 15 min after the start of the exercise, and the plasma glucose levels were significantly lower by 28 ± 29 mg/dl during the EX trial, compared with the REST trial. Furthermore, subjects who showed a large decline in their plasma glucose level in the EX trial, compared with the REST trial, had a significantly higher $\dot{V}O_2$max than those who showed minimal differences in plasma glucose levels between the two trials.

【Conclusion】
These results suggest that exercise after CHO ingestion causes a large fall in plasma glucose level by approximately 30 mg/dl, compared with the resting condition. Furthermore, subjects with a higher $\dot{V}O_2$max seem to be more prone to having a larger exercise-induced decline in blood glucose levels.

Keywords: transient hypoglycemia, plasma glucose, $\dot{V}O_2$max