

Original Article

Effect of ingestion of glucose ice cream after high-intensity intermittent exercise on insulin secretion in male athletes

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ABSTRACT

[Aim]

The purpose of this study was to compare the effects of ingestion of glucose ice cream, commercial ice cream and a carbohydrate-electrolyte beverage after high-intensity intermittent exercise on the insulin secretion.

[Methods]

Seven male subjects ingested the trial foods immediately after high-intensity intermittent exercise. Glucose-dependent insulinotropic polypeptide (GIP) and insulin secretions and the respiratory exchange ratio (RER) were measured immediately post-exercise, and 30, 45, 60 and 120 min after the exercise. The trial foods were glucose ice cream (G-ICE), commercial ice cream (C-ICE) and a carbohydrate-electrolyte (CHO) beverage containing carbohydrates at 1.2 g/kg body weight of the subject.

[Results]

GIP secretion at 30-120 min post-exercise in the subjects was significantly higher ($p < 0.05$) after the ingestion of G-ICE or C-ICE as compared to that after ingestion of the CHO beverage. Insulin secretion after G-ICE ingestion did not differ from that after ingestion of the CHO beverage. The RER at 30-120 min was significantly higher ($p < 0.05$) after ingestion of the CHO beverage as compared to that after ingestion of C-ICE or G-ICE.

[Conclusion]

Ingestion of G-ICE after high-intensity intermittent exercise was associated with a similar degree of increase in GIP secretion as ingestion of C-ICE. Insulin secretion after ingestion of G-ICE increased to a similar degree to that after ingestion of the CHO beverage. Carbohydrate oxidation of G-ICE was lower as compared that of CHO beverage. Therefore, ingestion of ice cream made with glucose immediately after exercise promoted secretion of insulin and reduced carbohydrate utilization. This finding suggests that ice cream made specially with glucose might be the optimal food to ingest to increase insulin secretion and reduce carbohydrate utilization after high-intensity intermittent exercise.

Keywords: GIP, blood glucose, respiratory exchange ratio, core temperature