The short-term effect of alcoholic beverage-intake on blood glucose levels in type 2 diabetic patients

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Abstract

We examined changes in blood glucose levels within 2 h after the respective intake of three kinds of alcoholic beverages in six type 2 diabetic men treated by diet alone. Blood glucose level following beer consumption was 195.0 ± 15.8 mg/dl after 60 min and those following sake consumption was 151.2 ± 9.0 mg/dl after 60 min. There was no significant increase in blood glucose levels after drinking shochu. It should be considered that in diabetic patients, the elevation of blood glucose was induced by the sugar contained in the alcoholic beverages, and the limited intake of alcoholic drinks is required to keep well blood glucose levels.

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It has been reported that moderate alcohol intake with a meal does not disturb blood glucose control in diabetic patients [1–3]. In six type 2 diabetic men treated by diet alone, we examined changes in blood glucose levels within 2 h after the respective intake of three kinds of alcoholic beverages. Patient characteristics were as follows: mean age 60 ± 15 years; BMI 21.7 ± 1.8; duration 10.6 ± 5.2 years; HbA1c 6.4 ± 0.4%; fasting immunoreactive insulin 3.2 ± 2.3 μU/ml. The other laboratory data were: total protein 7.1 ± 0.2 g/dl; serum albumin 4.5 ± 0.2 g/dl; aspartate aminotransferase 22.0 ± 6.9 IU/l; alanine aminotransferase 22.1 ± 6.9 IU/l; lactate dehydrogenase 202 ± 34.0; γ-glutamyl transpeptidase 18.7 ± 6.8 IU/l; hemoglobin level 15.0 ± 1.2 g/dl. None of the patients had significant systemic disease. Informed consent was obtained from each participant, and the study protocol was approved by the Hospital Ethics Committee. Alcoholic beverages used in this study were beer (Asahi super dry, Asahi Breweries Ltd., Japan), sake (Senjyo, Senjyo Co., Ltd., Japan) and shochu (Nikaido, Nikaido-Shuzo, Inc., Japan), which is made from wheat and distilled alcoholic beverage. After an overnight fast of 12–14 h, six participants drank sake (300 ml), beer (800 ml) or shochu (180 ml) on different days and glucose levels were serially measured before and 30 min, 60 min and 120 min after drinking each alcoholic beverage by the glucose oxidase method using Glutest-ace R* (Sanwa Kagaku Kenkyusho Co., Ltd., Japan). The mean glucose levels of the six patients were 104 ± 2.8 mg/dl before drinking beer, 103.8 ± 4.3 mg/dl before sake and 104 ± 3.3 mg/dl before shochu, respectively. Blood glucose levels following beer consumption were 165.0 ± 11.9 mg/dl after 30 min (P < 0.001 compared with that before drinking beer, t-test), 195.0 ± 15.8 mg/dl after 60 min (P < 0.0001, t-test) and 166.2 ± 6.4 mg/dl after 120 min (P < 0.001, t-test); and those following sake consumption were 130.4 ± 17.6 mg/dl after 30 min (P < 0.07 as compared with that before drinking sake, t-test), 151.2 ± 9.0 mg/dl after 60 min (P < 0.001, t-test) and 130 ± 8.0 mg/dl after 120 min (P < 0.05, t-test) as shown in Fig. 1. Blood glucose levels following shochu consumption were 107.0 ± 11.4 mg/dl after 30 min, 106.0 ± 5.2 mg/dl after 60 min and 104.6 ± 6.3 mg/dl after 120 min, showing that there was no significant increase in blood glucose levels after drinking.

It has been indicated that ethanol intake is not associated with utilization of ingested calories or body weight gain [4–6].
In the present study, the carbohydrate contents of beer, sake and shochu were as follows: ethanol, 3.7%, 12.3% and 20.5%, respectively; glucose, 3.1%, 4.9% and 0%, respectively. There were negligible traces of lipids and proteins in each of the three alcoholic beverages. Although, the consumption of ethanol was almost equal with each of the alcoholic beverages examined, the amounts of glucose were 24.8 g in 800 ml of beer, 14.7 g in 300 ml of sake and 0 g in 180 ml shochu, resulting in the highest blood glucose levels in patients having beer occurring 60 min after drinking. It should be considered that in diabetic patients, the elevation of blood glucose was induced by the sugar contained in the alcoholic beverages, and the limited intake of alcoholic drinks is required to keep well blood glucose levels.

Conflict of interest

The authors state that they have no conflict of interest.

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REFERENCES