A high-resistance-starch rice diet reduces glycosylated hemoglobin levels and improves the antioxidant status in diabetic rats

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Abstract

Diabetes mellitus is a common problem in developed countries. An improved postprandial hyperglycemic peak is one of the main therapeutic targets in diabetic patients. The Wistar rats with streptozotocin (STZ)-induced diabetes were divided into cornstarch (control) and Japonica rice groups, which were fed 640 g starch/kg diets for 4 weeks. The area (means ± SD) under the glucose curve of cornstarch was 173.8 ± 6.9 and Japonica rice diet was 154.3 ± 8.7 mmol × min/L, and the area (means ± SD) under the insulin curve of cornstarch was 12.9 ± 0.1 and Japonica rice diet was 12.0 ± 0.6 nmol × min/L. The glycosylated hemoglobin levels, serum fructosamine and cholesterol concentrations in diabetic rats fed the Japonica rice diet were significantly lower than the control group ($P < 0.05$). The decreased malondialdehyde levels and increased superoxide dismutase activity and total radical-trapping antioxidant parameter in plasma were also found in rat fed the Japonica rice diet compared to the control. These results suggested that the diet containing high-resistance-starch Japonica rice might reduce glycosylated hemoglobin levels, serum cholesterol concentrations and raised the antioxidant status in the blood.