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Administration of beta-carotene suppresses lipid peroxidation in tissues and improves the glucose tolerance ability of streptozotocin-induced diabetic rats

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The present study attempted to examine the antioxidative effect of dietary beta-carotene (BC) on lipid peroxidation (LPO) in the streptozotocin (STZ)-induced diabetic rats. Male Sprague-Dawley (SD) rats were fed on the AIN76 standard diet with or without 0.1% BC. On the 21st day after introduction of these diets, STZ was intraperitoneally injected in half the subjects of both groups. All animals were sacrificed seven days after the STZ injection. Glucose tolerance and thiobarbituric acid reactive substance (TBARS) in the tissues or serum were measured. Body weight gain in the BC + STZ group was significantly higher than that in the STZ group ($p < 0.05$). Blood glucose and TBARS concentrations of the liver, pancreas, and serum in the BC + STZ group were significantly lower than those in the STZ group. The blood insulin concentration in the BC + STZ group was significantly higher than that in the STZ group. The hepatic and serum beta-carotene concentrations in the BC + STZ group were significantly lower than those in the BC group. Moreover, the synthesis and oxidation of glutathione (GSH) in the BC + STZ group were reduced when compared to the STZ group. These results suggest that the administration of beta-carotene suppresses the elevation of LPO and reduces the symptoms of diabetes mellitus (DM) in the STZ-induced diabetic rats.