

A Studies on the antidiabetic activities of Momordica charantia fruit juice in streptozotocin-induced diabetic rats.

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Abstract

Context: Momordica charantia Linn (Cucurbitaceae) (MC) is used in folk medicine to treat various diseases including diabetes mellitus.

Objective: This study investigates the antidiabetic activities of Momordica charantia (bitter gourd) on streptozotocin-induced type 2 diabetes mellitus in rats.

Materials and methods: Male Wister rats were randomly assigned to 4 groups. Group I, Normal control; Group II, STZ diabetic; Group III and IV, Momordica charantia fruit juice was orally administered to diabetic rats (10 mL/kg/day either as prophylaxis for 14 days before induction of diabetes then 21 days treatment, or as treatment given for 21 days after induction of diabetes). The effects of MC juice were studied both in vivo and in vitro by studying the glucose uptake of isolated rat diaphragm muscles in the presence and absence of insulin. Histopathological examination of pancreas was also performed.

Results: This study showed that MC caused a significant reduction of serum glucose (135.99 ± 6.27 and 149.79 ± 1.90 vs. $253.40^* \pm 8.18$) for prophylaxis and treatment respectively, fructosamine (0.99 ± 0.01 and 1.01 ± 0.04 vs. 3.04 ± 0.07), total cholesterol, triglycerides levels, insulin resistance index (1.13 ± 0.08 and 1.19 ± 0.05 vs. 1.48 ± 1.47) and pancreatic malondialdehyde content ($p < 0.05$). While it induced a significant increase of serum insulin (3.41 ± 0.08 and 3.28 ± 0.08 vs. 2.39 ± 0.27), HDL-cholesterol, total antioxidant capacity levels, β cell function percent, and pancreatic reduced glutathione (GSH) content ($p < 0.05$) and improved histopathological changes of the pancreas. It also increased glucose uptake by diaphragms of normal (12.17 ± 0.60 vs. 9.07 ± 0.66) and diabetic rats (8.37 ± 0.28 vs. 4.29 ± 0.51) in the absence and presence of insulin ($p < 0.05$).

Conclusions: Momordica charantia presents excellent antidiabetic and antioxidant activities and thus has great potential as a new source for diabetes treatment whether it is used for prophylaxis or treatment.

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