THE CYTOTOXIC EVALUATION AND REGENERATIVE POTENTIALS OF ISOFLAVONES IN DIABETIC ANIMAL MODELS

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The present study evaluated the antidiabetic effect of daidzein based on its ability to lower blood glucose, and influence the regenerative mechanism of pancreatic β-cell in type 1 diabetic animal models. Furthermore, the cytotoxic effect of this isoflavone at dose of 100mg/kg and 200mg/kg of animal body weight was evaluated in the kidney.

Diabetes mellitus (DM) is a global burden afflicting a substantial population, the disease is characterized by the disruption of glucose homeostasis which arises from the dysfunction of insulin to act on peripheral tissues (insulin resistance). Disruption of glucose homeostasis results in damaging consequences to many vital organs such as the kidney, heart, eyes as well as the nervous system and, if left untreated, with a decrease in quality of life and an increased rate of mortality [1]. Isoflavones such as daidzein, genistein and glycitein are phytochemicals compounds richly found in leguminous plants, and have been suggested as potential antidiabetic agents owing to their ability to reduce hyperglycemia, and to act as an anti-inflammatory and antioxidant agents [2]. The present study is aimed to study the possible cytotoxic effect of daidzein at different doses, while simultaneously evaluating the regenerative potential of this phytochemical in diabetic animal models. Daidzein belongs to isoflavones, phytochemicals identified as potential antidiabetic therapeutic owing to their ability to lower hyperglycemia, counter reactive oxygen species, and reduce inflammation.

Animals were rendered diabetic using a single intraperitoneal injection dose of alloxan monohydrate at a dose of 170 mg kg^{-1} body weight of animal. After 4 weeks of treatment with daidzein led to increase their body weight. The biochemical evaluation showed a decrease in glucose by 33% and Hb1Ac levels in the blood of diabetic animals as compared to the diabetic control group. Histological examination of kidney showed no structural changes even at doses of 200 mg/kg of animal body weight. Additionally, immunohistochemical and morphometric evaluation showed that isoflavones enhanced the proliferation of insulin producing cells in the pancreatic islet. It could be suggested from the findings that daidzein at dose of 100 or 200 mg/kg of animal body weight showed no cytotoxic effects, and act as possible hypoglycemic agent in type 1 diabetic animal model.

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