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College of Pharmacy

Protective Effects of Some Antioxidant Supplements in Rabbits with Induced Diabetic Nephropathy.

A Thesis
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Abstract

Diabetes mellitus is a group of metabolic disorders which is characterized by elevation in blood glucose levels (hyperglycemia) and insufficiency in insulin production or action that is produced inside the body by the pancreas. Long term elevation in levels of blood glucose are associated with macro- and micro-vascular complications leading to heart diseases, blindness, stroke, and kidney diseases. Diabetic kidney disease is defined as diabetes with albuminuria, impaired glomerular filtration rate, or both, and is the single strongest predictor of mortality in patients with diabetes. Oxidative stress plays a pivotal role in the development of diabetes complications. There are many antioxidant agents used for delaying diabetic kidney disease progression like vitamin C and thioctic acid.

The objective of this study is to evaluate the protective effects of different combination of antioxidant agents on renal function test, glycemic control state and low-density lipoprotein cholesterol (LDL-c) plasma level in diabetic induced rabbits.

The methodology of this study is that the fourty male and female rabbits weighing 1000-1300 grams were divided randomly into five groups. Then diabetic induction was done and blood glucose level was followed up within 5 days. Diabetes mellitus was induced in the overnight fasted rabbits by a single intraperitoneal injection of streptozotocin in a dose of 50 mg/kg. Then animals started antioxidant treatment and blood sampling were taken each 2 weeks. The laboratory analysis which includes blood sugar, serum urea, serum creatinine, serum electrolyte, serum low-density lipoprotein-cholesterol were done.

The various antioxidants were used in different combination in treated 1 group (quercetin 15 mg/kg and L-carnitine 15 mg/kg) and treated 2 group (quercetin 15 mg/kg, L-carnitine 15 mg/kg, Thioctic acid 20mg/kg, Vitamin C 15mg/kg) orally.

The results of this study were a non-significant decrease in serum glucose level in treated 1 group and treated 2 group (which treated with a different combination of antioxidants) compared with the diabetic control group, a significant decrease in serum (urea, creatinine, and LDL-c) levels in treated 1 group and treated 2 group compared with the diabetic control group. Also, a significant increase in serum (potassium and chloride) levels, and a non-significant increase in serum sodium level in treated 1 group and treated 2 group compared with the diabetic control group.

The conclusions of this study have demonstrated the role of antioxidants as protective compounds against diabetic kidney disease through the free radicals scavenging properties.