ABSTRACT

The Effect of Pumpkin Seed Oil in the Management of Dietary-Induced Hypercholesterolemia in Sprague-Dawley Rats

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The oil of the pumpkin (*Cucurbita species*) seeds (PSO) is a rich source of cardioprotective compounds. It is therefore hypothesized that since PSO is a rich source of these cardioprotective compounds, it will prevent the elevations in total cholesterol and provides antiatherogenic action induced by hypercholesterolemia.

The study involved the use of Sprague-Dawley rats. Hypercholesterolemia was induced by feeding rats with food containing 4 % cholesterol and 1 % cholic acid. Animals receiving this hypercholesterolemic diet (CC) or normal rat chow (N) were subdivided to receive oral dosing of olive oil (CC+OO) or (N+OO), PSO at 40 mg/kg and PSO at 80 mg/kg. Plasma lipoprotein parameters and vascular reactivity was assessed. Liver sections were histologically evaluated.

TC and LDL-C concentrations increased in CC+OO group when compared to rats on normal diet, N+OO (208.26 ± 26.3 mg/dl in CC+OO vs. 52.53 ± 5.81 mg/dl in

N+OO; $p < .001$) and (192.76 ± 25.59 mg/dl in CC+OO vs. 24.77 ± 5.38 mg/dl in N+OO; $p < .001$) respectively. This elevation in TC and LDL-C induced by the hypercholestoremic diet was inhibited by PSO supplementation.

Rats in the CC+OO group after histological examination showed significant disruption to the hepatic cytoarchitecture and fatty degeneration of hepatocytes. Hypercholesterolemic groups receiving PSO were protected from this infiltration.

Endothelium dependent relaxation was significantly impaired in rats on the hypercholesterolemic diet (CC+OO). This impairment was prevented by PSO supplementation. The endothelium independent relaxations assessed with sodium nitroprusside showed no difference between the groups.

It can be concluded from this study that PSO supplementation has the potential to prevent diet-induced hypercholesterolemia, the deleterious effects on fat infiltration of hepatocytes and vascular alterations.

Keywords: Tamara Amoy Melville; Hypercholesterolemia; Pumpkin seed oil; Vascular reactivity.