Impact of Aqueous Extract of Plantago Ovata Fork (Psyllium) Fruit on the Improvement of Non-alcoholicFatty Liver Disease among Male Rats

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Abstract

Background and Aim: Non-alcoholic fatty liver disease (NAFLD) encompasses a wide spectrum of disorder and damage to the liver. Plantago psyllium possesses hypolipidemic (fat reducing) and antioxidant properties. According to increased prevalence of NAFLD and the positive impact of some herbal remedies (antioxidants) in the prevention and treatment of disease, this study was aimed to investigate the effect of psyllium extract on NAFLD. Materials and Methods: In this experimental study, 56 adult male Wister rats were divided into seven groups of eight animals including control and sham 1 and 2 (induced fatty liver). Experimental group 1 received psyllium extract with a concentration of 400 mg/kg and experimental groups 2, 3, and 4 received psyllium extract with a concentration of100 mg/kg, 200 mg/kg, and 400 mg/kg, respectively, after the induction of fatty liver over 28 consecutive days. Blood samples were taken from the animal's heart a day after the last injection, and alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP) liver enzymes concentration as well as low-density lipoprotein (LDL), high-density lipoprotein (HDL), and total cholesterol (TC) were measured. The results were analyzed through analysis of variance and Duncan's test. The statistical significance level was set at $P > 0.05$. Findings: The mean serum HDL, TC, and triglycerides (TG) levels were significantly decreased in the sham groups 1 and 2 compared to the control group. The mean serum ALT, ALP, TC, and TG levels were significantly decreased in theexperimental group 1 compared to the control group. The mean serum ALT, AST, and ALP levels were significantly decreased in the experimental groups 3 and 4 compared to the sham groups 1 and 2, but the mean serum ALT and ALP levels in the experimental group 2 were significantly different from the sham groups 1 and 2, and no change was found in the mean serum AST level. Furthermore, in the experimental group 3, the mean serum TC and TG levels were decreased significantly compared to the sham group 1 and the control group, and the mean serum TG also showed a significant decrease in the experimental group 3 compared to the sham group 2. However, there was no change in the mean serum TC in the experimental group 3 compared to the sham group 2. However, there was no change in the mean serum TC in the experimental group 3 compared to the sham group 2. The mean serum HDL level showed a significant increase in the experimental group 4 compared with the sham group 2 and decreased significantly in the experimental groups 2, 3, and 4 compared

to the control group. The mean serum LDL level was significantly decreased in experimental (2, 3, and 4) groups compared to the sham groups (1 and 2), but there was no change compared to the control group. Conclusion: According to the results, the psyllium extract can probably induce hepatoprotective effect and improvement of liver enzymes disorder as well as lipid profile in non-alcoholicfatty liver patients due to the antioxidant properties.

Keywords: Non-alcoholic fatty liver; plantago ovata fork (psyllium) fruit; rat