Effects of walnut on lipid profile and expression of SREBP-1c and PPARα in diabetic rat

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Background and Aims: Diabetes Mellitus has appeared as a universal burden. Studies have reported that mortality from Coronary Heart Disease (CHD) in diabetic patients is 2 - 4 times higher than nondiabetics. In this respect, walnut is a treatment which has beneficial effects on CHD risk factors. PPARα and SREBP-1c play an important role in the regulation of lipid metabolism. This study was aimed to evaluate the effects of walnut on lipid profile as well as SREBP-1c and PPARα protein levels in rats.

Methods: Animals were randomly divided into 3 groups (n = 6); Group 1: Received chow only (control), Group 2: Diabetic rats + chow, Group 3: Diabetic rats + chow supplemented with 4% of whole walnuts. After four weeks rats were sacrificed, blood was collected; lipid profiles as well as SREBP-1c and PPARα protein levels were determined.

Results: Compared with diabetic rats walnut significantly decreased serum cholesterol ($P < 0.01$), LDL-c ($P < 0.01$), triglyceride ($P < 0.001$) and VLDL-c ($P < 0.001$) and also increased HDL-c ($P < 0.05$) compared with diabetic. Moreover, SREBP-1c protein level significantly decreased ($P < 0.05$) and PPARα significantly increased in walnut group compared with diabetic group ($P < 0.05$).

Conclusions: The findings showed that walnut administration in diet clinically decreases atherosclerosis risk factors. Lipid profile reduction might be due to the rise of PPARα and the reduction of SREBP-1c by this medical treatment in liver.

Keywords: Walnut; Cholesterol; SREBP-1c; PPARα