

LDL-R, HMG-CoA reductase genes expression, antioxidant capacity and histological changes induced by *Anethum graveolens* in hypercholesterolemic hamsters

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Objective: The aim of this study was determination of the effect of *Anethumgraveolens* extract and *anethumgraveolens* (dill) tablet on lipid profile, liver enzymes and histological change and gene expression and enzymatic activity of LDL-R and HMG-CoA reductase in control and high cholesterol fed hamsters(HCD).

Materials & Methods: Golden Syrian male hamsters (130 ± 10 g) were randomly divided into 6 groups (n=6) and received daily as following: Group 1: chow +2% cholesterol + 0.5% cholic acid, group 2: chow + 100 mg/kg hydroalcoholic extract of dill +2% cholesterol + 0.5% cholic acid, group 3: chow + 200 mg/kg hydroalcoholic extract of dill +2% cholesterol + 0.5% cholic acid, group 4: chow + 100 mg/kg dill tablet + 2% cholesterol+0.5% cholic acid, group 5: chow + 200 mg/kg dill tablet +2% cholesterol+0.5% cholic acid, and group 6: chow. After 1 month feeding, animals were anesthetized and sacrificed, biochemical factors were determined enzymatically. LDL-R and HMG-CoA reductase mRNA level was measured by Real time PCR and its activity was determined spectrophotometrically.

Results: Compared with hypercholesterolemic group-1, lipid profile, blood glucose and liver enzymes significantly decreased in all dill tablet-received or dill extract-treated groups (p<0.05). The changes in HMG-CoA reductase gene expression level and enzyme activity were not significant in animals received 100 mg/kg of hydroalcoholic extract or dill tablet, but werereduced in animals received 200 mg/kg of extract or tablet. The expression of LDL-R significantly increased in animals received 200 mg/kg of extract or tablet. Liver and heart antioxidant significantly increased by *Anethum graveolens*. Liver histopatological changes were normalized by *Anethum graveolens*.

Conclusion: Dill can significantly reduce HMG-CoA reductase activity and its gene expression level in hypercholesterolemia. *Anethum graveolens* can also significantly increase LDL-R gene expression in HCD animals. This study showed that dill extract and dill tablet has potential hypocholesterolaemic properties in hamsters by inhibition of HMG-CoA reductase activity.

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