

Lipid lowering effect of antioxidant alpha-lipoic acid in experimental atherosclerosis.

ABSTRACT

Accumulating data demonstrated that hypercholesterolemia and oxidative stress play an important role in the development of atherosclerosis. In the present study, a protective activity of alpha-lipoic acid; a metabolic antioxidant in hypercholesterolemic-induced animals was investigated. Eighteen adult male New Zealand White (NZW) rabbit were segregated into three groups labelled as group N, HCD and ALA (n = 6). Group N (normal control) was fed with normal chow, the rest (HCD and ALA) were fed with 100 g/head/day of 1% cholesterol rich diet to induce hypercholesterolemia. Four point two mg/body weight of alpha lipoic acid was concomitantly supplemented to the ALA group. Drinking water was given ad-libitum. The study was designed for 10 weeks. Blood sampling was taken from the ear lobe vein at the beginning, week 5 and week 10. Plasma was prepared for lipid profile estimation and microsomal lipid peroxidation index indicated with malondialdehyde (MDA) formation. At the end of the experiment, the animals were sacrificed and the aorta were excised for intimal lesion analysis. The plasma total cholesterol (TC) and low density lipoprotein (LDL) levels were found to be significantly low in ALA group compared to that of the HCD group ($P < 0.05$). Similarly, low level of MDA ($p < 0.05$) in ALA group was observed compared to that of the HCD group showing a significant reduction of lipid peroxidation activity. Histomorphometric intimal lesion analysis of the aorta showing less of atheromatous plaque formation in alpha lipoic acid supplemented group ($p < 0.05$) compared to HCD group. These findings suggested that alpha lipoic acid posses a dual lipid lowering and anti-atherosclerotic properties indicated with low plasma TC and LDL levels and reduction of athero-lesion formation in hypercholesterolemic-induced rabbits.

Keyword: Alpha lipoic acid; Antioxidant; Atherosclerosis; Intimal lesion; Lipid peroxidation.