Alpha lipoic acid posses dual antioxidant and lipid lowering properties in athersclerotic-induced New Zealand white rabbit

ABSTRACT

There is accumulating data demonstrated 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 K, AT and ALA (n=6). While group K was fed with normal chow and acted as a control, the rest fed with 100 g/head/day with 1% high cholesterol diet to induce hypercholesterolemia. 4.2 mg/body weight of alpha lipoic acid was supplemented daily 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 of the study, week 5 and week 10 and plasma was prepared for lipid profile estimation and microsomal lipid peroxidation index indicated with malondialdehyde (MDA) formation. Animals were sacrificed at the end of the study and the aortas were excised for intimal lesion analysis. The results showed a significant reduction of lipid peroxidation index indicated with low MDA level ($p<0.05$) in ALA group compared to that of the AT group. The blood total cholesterol (TCHOL) and low density lipoprotein (LDL) levels were found to be significantly low in ALA group compared to that of the AT group ($p<0.05$). Histomorphometric intimal lesion analysis of the aorta showing less of atheromatous plaque formation in alpha lipoic acid supplemented group ($p<0.05$) compared to that of AT group. These findings suggested that apart from its antioxidant activity, alpha lipoic acid may also posses a lipid lowering effect indicated with low plasma TCHOL and LDL levels and reduced the athero-lesion formation in rabbits fed a high cholesterol diet.

Keyword: Alpha lipoic acid; Lipid profiles; Lipid peroxidation