3rd MIDDLE EAST - ASIA ALLERGY ASTHMA IMMUNOLOGY CONGRESS
11 - 13 December 2015
Jumeirah Etihad Towers | Abu Dhabi, UAE

Submission Code: ozyjdi5v

Title: Vitamin A decreases cytotoxicity of oxidized low-density lipoprotein in patients with atherosclerosis

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Background:
Oxidized low-density lipoprotein (ox-LDL) is implicated in initiation and progression of atherosclerosis. Previously, we found that ox-LDL increases vulnerability of peripheral blood mononuclear cells (PBMCs) in atherosclerotic patients compared to controls. Vitamin A induces proliferation of PBMCs. The aim of this study was to determine the effect of vitamin A supplementation on PBMCs survival against LDL and different doses of ox-LDL.

Methods:
In this double-blind placebo-controlled trial, we recruited 35 atherosclerotic patients and healthy controls, and randomly allocated them into placebo and vitamin A groups, which received either placebo or 25,000 IU/day of vitamin A for three months. PBMCs were isolated, cultured and stimulated by 1 μg/mL LDL as well as 1 μg/mL and 50 μg/mL ox-LDL. The stimulation indexes of PBMCs were calculated to identify cells viability. Additionally, the circulating ox-LDL levels were measured by ELISA.

Results:
Viability of PBMCs stimulated by 50 μg/mL ox-LDL significantly increased following vitamin A supplementation in patients ($P< 0.01$). The levels of circulating ox-LDL were not changed by vitamin A treatment. Ox-LDL levels were strongly and positively correlated to stimulation index of PBMCs stimulated by 1 μg/mL LDL and1 μg/mL ox-LDL in all groups.

Conclusions:

Vitamin A decreases cytotoxicity of high-dose ox-LDL and improves PBMCs viability. The protective effect of vitamin A is not mediated by an antioxidative mechanism, but may instead have been due to intracellular protection of the apoptotic machinery or induction of proliferation of the cells. Higher levels of ox-LDL increase PBMCs irritability in all participants.