

Inflammation and Vascular Calcification Causing Effects of Oxidized HDL are Attenuated by Adiponectin in Human Vascular Smooth Muscle Cells

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The role of oxidized high-density lipoprotein (oxHDL) and the protective effects of adiponectin in terms of vascular calcification is not well-established. This study was conducted to investigate the effects of oxHDL with regard to inflammation and vascular calcification and to determine the protective role of adiponectin in attenuating the detrimental effects of oxHDL. Cell viability, mineralization, and calcification assays were conducted to optimize the concentration of oxHDL. Then, human vascular smooth muscle cells (HAoVSMCs) were incubated with β -glycerophosphate, HDL, oxHDL, adiponectin, or the combination of oxHDL with adiponectin for 24 h. Protein expression of IL-6, TNF- α , osterix, RUNX2, ALP, type 1 collagen, osteopontin, osteocalcin, WNT-5a, NF- κ B (p65), cAMP and STAT-3 were measured by ELISA kits. OxHDL induced vascular calcification by promoting the formation of mineralization nodules and calcium deposits in HAoVSMCs. This was accompanied by an increased secretion of IL-6, osterix, WNT-5a and NF- κ B (p65). Interestingly, these detrimental effects of oxHDL were suppressed by adiponectin. Besides, incubation of adiponectin alone on HAoVSMCs showed a reduction of inflammatory cytokines, osteoblastic markers (RUNX2, osterix and osteopontin), WNT-5a and NF- κ B (p65). This study exhibits the ability of oxHDL in inducing inflammation and vascular calcification and these detrimental effects of oxHDL can be attenuated by adiponectin.

Key words: HAoVSMCs, oxidized high-density lipoprotein, osteoblastic transdifferentiation, vascular calcification, adiponectin

Vascular calcification, the deposition of calcium in the intima layer of arteries, accelerates the progression of atherosclerotic plaque formation and has been considered as the most

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