

Adiponectin and vascular properties in obese patients. Is it a novel biomarker of early atherosclerosis?

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Background: Adiponectin, an adipocyte-derived collagen-like protein may represent a link between obesity and atherosclerosis. Although adiponectin is highly specific to adipose tissue, the impact of plasma adiponectin levels on earliest stage of atherosclerosis in obese adults has not been investigated.

Aims: The present study was designed to investigate association between adiponectin and early vascular changes in obese patients as determined by intima media thickness (IMT) and arterial pulse-wave contour analysis.

Methods: Obese subjects (n=47) were evaluated for arterial structure and function, metabolic parameters and serum adiponectin levels. IMT was measured from intimal and medial wall layers of the carotid artery on both sides, visualized by high-resolution ultrasound. Arterial elasticity was evaluated using pulse wave contour analysis (CR-2000, Hypertension Diagnostics, MN). Insulin resistance was assessed by homeostasis model assessment (HOMA-IR).

Results: Adiponectin was significantly, inversely associated with mean IMT ($r=-0.369$, $p=0.011$) and significantly positively associated with large artery elasticity index (LAEI) ($r=0.467$, $p=0.001$) as well as small artery elasticity index (SAEI) ($r=0.462$, $p=0.001$). In multivariate models, adiponectin remained significantly associated with mean IMT, LAEI, and SAEI even after adjustment for cardiovascular confounders. Among metabolic parameters, adiponectin was significantly, positively associated with HDL cholesterol and inversely associated with triglycerides, insulin and HOMA-IR. Additionally, a marginally inverse association between adiponectin and ALT was observed.

Conclusions: The present study is the first to estimate a relation of serum adiponectin levels to early vascular changes identified by IMT and arterial pulse-wave contour analysis in obese adults. We found significant association between circulating adiponectin and indices of subclinical atherosclerosis in obese patients. This association was independent of traditional cardiovascular risk factors and suggests an active role of adiponectin in the pathophysiology of atherosclerotic vascular disease. Our data suggest that adiponectin override insulin resistance estimated by HOMA-IR as an independent marker for early atherosclerotic changes in obese subjects.

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