

Public Abstract

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Title:Expression of Adiponectin Receptors by Vascular Smooth Muscle Cells

A growing epidemic of obesity and related vascular disease such as atherosclerosis and thrombotic events such as heart attack and stroke underscore the need to further research the vasculature to determine molecular mechanisms that may tie obesity and thrombotic events together. Adiponectin (APN) is a 30-kDA insulin-sensitizing protein with strong effects on the vasculature. It binds three receptors: AdipoR1, AdipoR2, and T-cadherin. APN and AdipoRs are well-studied in the vascular endothelium, but studies describing the expression of AdipoRs in other vascular cells, particularly the vascular smooth muscle cells (VSMC), are lacking. Here, we show that cultured human coronary vascular smooth muscle cells (HCAVSMC) express AdipoR genes and protein, and that AdipoR genes are expressed in vivo by porcine coronary artery and murine aortic VSMC. APN reduces plasminogen activator inhibitor, type 1 (PAI-1), a molecule implicated in thrombotic events, expression by adipocytes, so we tested the functionality of the AdipoRs expressed by HCAVSMC by measuring the expression of PAI-1 mRNA expression in cells treated with recombinant human APN (rhAPN) or phosphate-buffered saline (PBS) control. There was no change in PAI-1 mRNA expression in rhAPN-treated cells vs. PBS-control treated cells over 48 hours (n=8, p=0.41). Therefore, we conclude that VSMC express AdipoRs but APN does not influence PAI-1 mRNA expression via a direct, receptor-mediated mechanism in HCAVSMC. These findings are an important step in recognizing how APN exerts its effects in the vasculature and in discovering a molecular link between the obesity and heart attack and stroke.