NITRIC OXIDE SYNTHASE-DEPENDENT VASODILATION OF HUMAN SUBCUTANEOUS ARTERIOLES CORRELATES WITH NONINVASIVE MEASUREMENTS OF ENDOTHELIAL FUNCTION.

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ABSTRACT

Background: Noninvasive measurements of endothelial function predict future adverse cardiovascular events, but offer limited opportunities for mechanistic insights into phenotypic observations. Subcutaneous adipose arterioles, accessible through minimally invasive methods, provide an opportunity for complimentary mechanistic studies. Limited data relating subcutaneous arteriolar endothelial function, cardiovascular risk factors, and noninvasive measurements of endothelial function currently exist. **Methods:** Forty-four subjects underwent noninvasive studies of endothelial function (brachial reactivity (flow-mediated dilation (FMD) and digital pulse arterial tonometry (PAT)) and measurements of endothelial-dependent vasodilation of gluteal subcutaneous arterioles to acetylcholine. Arteriolar endothelial function was measured (i) percent vasodilation to maximal acetylcholine dose (10(-5) mol/l) and (ii) total area under the curve (AUC) for the entire acetylcholine dose-response curve (total AUC-acetylcholine (Ach), doses 10(-10)-10(-5) mol/l). **Results:**Acetylcholine responses were almost completely nitric oxide (NO) dependent. Total AUC-Ach predicted FMD and PAT, but maximal acetylcholine vasodilation was not associated with these measures. A history of hypertension, diabetes, smoking, and low-density lipoprotein cholesterol levels were independent predictors of total AUC-Ach. In regression models, total AUC-Ach independently predicted FMD.**Conclusions:** Acetylcholine vasodilator responses in human gluteal subcutaneous arterioles are NO synthase dependent and correlate with cardiac risk factors and in vivo measures of endothelial function. These data suggest subcutaneous arterioles offer an opportunity for translational studies of mechanisms of modulating NO bioavailability relevant to in vivo endothelial function measures.[Am J Hypertens. 2012;25:528-34].

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