

Atherogenesis Prevented With Arginine

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Atherogenesis is enhanced in arterial segments exposed to disturbed blood flow, indicating the active participation of the hemodynamic environment in lesion formation. Turbulent shear stress selectively regulates responsive genes in the endothelium and increases the damage induced by free radicals. The purpose of the present study was to evaluate the effects of intervention with antioxidants and L-arginine on endothelial NO synthase (eNOS) and oxidation-sensitive gene perturbation induced by disturbed flow *in vitro* and *in vivo*. Both human endothelial cells exposed to shear stress and high atherosclerosis-prone areas of hypercholesterolemic low-density lipoprotein receptor knockout (LDLR^{-/-}) mice showed increased activities of redox-transcription factors (ELK-1, p-Jun, and p-CREB) and decreased expression of eNOS. Intervention with antioxidants and L-arginine reduced the activation of redox-transcription factors and increased eNOS expression in cells and *in vivo*. **These results demonstrate that atherogenic effects induced by turbulent shear stress can be prevented by co-treatment with antioxidants and L-arginine.** The therapeutic possibility to modulate shear stress-response genes may have important implications for the prevention of atherosclerosis and its clinical manifestations.