

Atherosclerosis is associated with systemic risk factors such as hypertension, hyperlipidemia, diabetes mellitus and smoking. Nonetheless, atherosclerosis is a focal disease, preferentially affecting predisposed areas. The main local hemodynamic factor is wall shear stress, the frictional force acting tangentially on the endothelial cell surface. The effect of wall shear stress depends on its magnitude and direction, as well as on the characteristic of vessel geometry and blood flow. Wall shear stress is an important determinant of endothelial function and phenotype. Previous research showed that arterial sites with chronically low WSS are more prone to the development of atherosclerotic plaques. Mostly, it is the case of outer wall of arterial bifurcations, where the stroma of vessel wall prevents arterio-constriction in response to low WSS. However, lower WSS was described also in straight arterial segments, such as carotid arteries, in the presence of atherosclerosis risk factors.