Trans-Unsaturated Fatty Acids and Acrylamide in Food as Potential Atherosclerosis Progression Factors. Based on own Studies

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Abstract

Atherosclerosis is a chronic pathological process and it is generally accepted that lipids, coagulation and inflammatory factors play an important role in its development. Environmental factors such as bed diet and cigarette smoking strongly stimulate initiation and progression of atherosclerotic changes in the artery wall. It has been recognized that deeply processed food may be a source of various factors potentiating processes related to atherosclerosis development among which inflammatory processes are of great importance. The aim of our studies was to find out if the trans-unsaturated fatty acids as well as acrylamide present in foods have the potential to provoke pro-inflammatory states in the body and enhance atherosclerosis risk. The results of our in vitro studies have shown that trans fatty acids cause a significant increase in secretion of reactive oxygen species, interleukin-6, tumor necrosis factor a and metalloproteinase-9, and enhance apoptosis. It indicates that in vivo trans-fatty acids may destroy the endothelium integrity and cause plaque rupture. Our in vivo studies in the group of healthy volunteers have shown that the consumption of potato chips rich in acrylamide cause the significant increase in plasma C-reactive protein and homocysteine concentrations. Enhanced CRP and HCY levels are accepted markers of enhanced atherosclerosis risk.