New insights into chronic inflammation and atherosclerosis

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Inflammatory rheumatic disease and smoking independently predict aortic inflammation, suggests study of coronary artery surgery survivors

Rheumatoid arthritis, lupus, and other inflammatory rheumatic diseases are associated with a high rate of death from heart disease. One explanation is a greater susceptibility to atherosclerosis. Although atherosclerosis is linked to inflammation in healthy individuals as well, the mechanism of inflammation and the reason for accelerated atherosclerosis in patients with inflammatory rheumatic disease remain unclear. Does atherosclerosis result from systemic inflammation, a hallmark of these rheumatic diseases, or from local inflammation of vessels?

To shed light on the link between chronic inflammation and atherosclerosis, a team of researchers in Norway and the United States, affiliated with the Cleveland Clinic Foundation and Brigham and Women's Hospital in Boston, focused on the aortas of recent recipients of coronary artery bypass graft (CABG) surgery, comparing biopsy specimens from patients with inflammatory rheumatic disease to those from patients without it. Their study, presented in the June 2007 issue of Arthritis & Rheumatism (http://www.interscience.wiley.com/journal/arthritis), affirms inflammatory rheumatic disease and smoking as independent predictors of vessel wall inflammation. The vascular inflammation might be a factor that promotes atherosclerosis and the formation of aneurysms.

Aortic samples were obtained during CABG surgery, performed at two cardiac centers in Norway, from 66 patients with inflammatory rheumatic disease and 51 control patients. The inflammatory rheumatic disease group included patients with rheumatoid arthritis, psoriatic arthritis, lupus, ankylosing spondylitis, polymyalgia and other diseases. Age, body mass index, family history of heart disease, and other traditional cardiovascular risk factors were similar in both groups. All specimens were evaluated, by light microscope, for evidence of chronic inflammatory cell infiltration in the aortic wall. This was achieved by counting and measuring the mononuclear cell infiltrates (MCI) in the aorta, with particular attention to the adventitia, the deepest layer of vascular tissue. Using statistical analysis, the relationship between these inflammatory infiltrates and established lifestyle risk factors for heart disease was also assessed.

In the adventitia, MCIs occurred more frequently in patients with inflammatory rheumatic disease -- 47 percent of this group, compared with 20 percent of the control group. Along with greater prevalence, these inflammatory cells were larger in size. In the middle layer of the vessel wall (the media), MCIs were detected only in patients with inflammatory rheumatic disease. What's more, MCIs were observed in 6 of 7 patients with a history of aortic aneurysm. In addition to inflammatory rheumatic disease, current smoking was independently associated with more pronounced chronic inflammatory infiltration in the inner adventitia.

"The opportunities for detecting aortic inflammation are limited," acknowledges the study's spokesperson, Ivana Hollan, M.D. "Our method of tissue examination allows the condition to be diagnosed in patients undergoing CABG surgery without increasing the preoperative risk."

Despite the limitations of its small sample size, this groundbreaking

study of aortic inflammation in patients with inflammatory rheumatic disease indicates the need for further investigation into an inflammatory process that may increase vulnerability to dying from a heart attack or aneurysm.

Source: John Wiley & Sons, Inc.