

Predictors of Increased Carotid Atherosclerosis in RA Patients

Summarized by Jon Giles, MD

RA patients are at an increased risk for cardiovascular events and death from cardiovascular disease. In the general population, and in RA patients (Jane, link to ACR2005 abstract 1901), carotid atherosclerosis (defined by identification of a thickened intima-medial or plaque using ultrasound) is highly predictive of cardiovascular events. Despite this, previous studies (see http://www.hopkins-arthritis.org/news-archive/2003/carotid_plaque.html) have not identified a clear-cut increased risk for carotid plaque in individuals with RA compared to non-RA controls. Here, Roman et al. (*Ann Intern Med* 2006; 144:249) confirm this risk for the first time.

Methods Adult RA patients with and without prior known cardiovascular disease were recruited from the Rheumatoid Arthritis Registry at the Hospital for Special Surgery in New York City to undergo carotid ultrasonography. RA subjects were matched based on age, gender, and ethnicity to a single subject participating in a longitudinal study of hypertension. Although RA subjects and controls were drawn from separate studies, identical protocols for the acquisition of carotid scans were used. In addition, the ultrasound studies were evaluated by a single cardiologist blinded to RA status. Studies in control subjects were performed several 1 to 3 years prior to RA subjects.

Results 98 RA patients were enrolled. The RA subjects were predominantly female (98%), White (72%), with a mean age of 48 years (range 20 to 83 years). Mean duration of RA was 12 years. Seropositivity for rheumatoid factor and anti-CCP antibodies was 57% and 50%, respectively. 2 subjects (one male and one female) had known prior cardiovascular disease. Compared to age, gender, and race matched controls, RA patients were balanced in terms of body mass index, serum total cholesterol, self-reported diabetes, and hypertension, although mean systolic and diastolic blood pressures were greater in the control group. The control group had a significantly higher proportion of current smokers.

44% of RA subjects demonstrated carotid plaque, compared to 15% of controls ($p < 0.001$). Significant differences in the prevalence of carotid plaque were noted in RA subjects for all decades past 40 years. Interestingly, mean intima-medial thickness was higher in the control group. Among the combined groups, significant predictors for carotid plaque included RA diagnosis, increasing age, and current smoking.

Among RA subjects, significant predictors of carotid plaque included conventional cardiovascular risk factors (age, systolic blood pressure, elevated total cholesterol and LDL levels, and homocysteine levels) and RA associated factors (prescription of TNF inhibitors). Other RA-associated characteristics, such as disease duration, swollen and tender joint count, deformed or replaced joint counts, HAQ disability score, and use of non-biologic DMARDs did not significantly differ between RA subjects with and without plaque.

Conclusions Carotid plaque detected by ultrasound is more prevalent in RA patients compared to matched controls, particularly in RA patients in younger age groups. Among RA patients, conventional cardiovascular risk factors are associated with a higher prevalence of carotid plaque.

Editorial Comment These results are striking not only because they demonstrate a markedly increased prevalence of carotid atherosclerosis in a predominantly young, female (i.e. presumably low risk) group of RA patients, but also because they differ from previous studies of RA patients. Some of these differences may be due to the differences (i.e. geographic, ages, presence of cardiovascular risk factors, etc,...) in the RA populations studied, but may also be related to study design and the choice of control groups. For this study, details about the control group are few, and it is thus difficult to decide how similar, or dissimilar, the groups really are with the exception of RA diagnosis. In addition, it is interesting that carotid intima-medial thickness and carotid plaque are so different, and in fact even divergent, in these two groups. Further studies are required to confirm these findings. Also, prospective studies are required to help elucidate the mechanisms of increased carotid plaque in this population. Cross-sectional studies of this type are unable to identify whether the increased prevalence of an intermediate risk factor such as carotid plaque are associated with an increased incidence of “hard” cardiovascular outcomes (i.e. myocardial infarction, sudden cardiac death, or stroke).

Lastly, this study would suggest that conventional cardiovascular risk factors are more potent in RA patients in the formation of carotid plaque. Thus, an emphasis on the control of conventional risk factors may be of the utmost importance in RA patients.