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Original Articles

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Using C-Reactive Protein as a Marker of Bacterially Aggravated Atherosclerosis in Acute Coronary Syndromes

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Background— Inflammatory and infectious markers such as C-reactive protein (CRP) have been proposed as indicators of the development or progression of coronary artery disease resulting from bacterial invasion of atherosclerotic plaques. The incidence of such bacterial involvement and its treatment response has not been clearly elucidated in the clinical setting. This study prospectively looked at individuals with newly diagnosed coronary artery disease (CAD), the incidence of elevated CRP levels, the association with acute phase antibodies (APA), detectability of the thymus gland, and macrolide antibiotic treatment response in individuals with bacterially aggravated atherosclerosis (BAA).

Methods—In part 1 of this study, 132 patients (44 women and 88 men), were studied via myocardial perfusion imaging (MPI) using high-dose dipyridamole (HDD) and Sestamibi injection following standardized single photon emission computed tomography (SPECT) and anterior (thymus) planar imaging. All 132 had blood drawn to measure CRP concentrations. When CRP levels were elevated, APAs for *H. pylori, C. pneumoniae,* and *S. pneumoniae* were measured. Results of CRP, APAs, and MPI and thymus imaging (TI) were compared. Thymus imaging was repeated following MPI. In part 2, individuals with elevated CRP and APA were treated for 2 weeks with macrolide antibiotic therapy and then restudied 2 weeks following completion of successful antibiotic therapy.

Results— In part 1, of this study, 34 of the 132 patients with newly diagnosed CAD had elevated CRP levels. Of these, 32 (94%) of the 34 had APA for *H. pylori* and/or *C. pneumoniae*. No patients had APA for *S. pneumoniae*. The remaining 2 individuals with elevated CRP levels had ulcerative colitis. Thymus gland activity was present during the anterior planar imaging period in 100% (34 of 34) of those with elevated CRP levels. Efforts to measure thymus activity 40 minutes later, following MPI, were unsuccessful. In part 2, 32 of the original 132 patients (24%) with elevated CRP and APA levels were restudied 2 weeks after completion of their 2 weeks of macrolide antibiotic therapy. In 100% of them (11 women and 21 men), the CRP normalized, and APAs were no longer elevated. Improvement in CAD was also seen on MPI.

Conclusion—Bacterially aggravated atherosclerosis (BAA) was present in 24% (32 of 132) of patients with newly diagnosed CAD. In each, APAs for *H. pylori* and/or *C. pneumoniae* were detected in addition to thymus activity on planar imaging acquired immediately before MPI. In each instance, treatment with 2 weeks of macrolide antibiotic therapy resulted in normalization of CRP levels, absence of elevated APAs, and failure to detect thymus activity on follow-up imaging. Concomitant MPI demonstrated improvement in coronary blood flow following macrolide therapy, although to varying degrees for each individual, consistent with varying significance. Not all patients with elevated CRP levels had BAA, and care must be taken to distinguish which ones do, to avoid the indiscriminate use of antibiotics. When patients have BAA, macrolide treatment provides an additional treatment for CAD.

Key Words: •C-RP •Acute Coronary Syndromes • Bacterially aggravated atherosclerosis(BAA)

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