



Aortic Regurgitation Is Common in Ankylosing Spondylitis: Time for Routine Echocardiography Evaluation?

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ABSTRACT

OBJECTIVES: The aim of this study was to assess the prevalence of aortic regurgitation and any relation to disease activity and specific human leukocyte antigen (HLA)-B27 subtypes in patients with ankylosing spondylitis.

METHODS: Transthoracic echocardiography was performed in 187 patients (105 men), mean age (SD) 50 (13) years, and mean disease duration 24 (13) years, and was related to demographic, clinical, radiographic, electrocardiographic, and laboratory data.

RESULTS: Aortic regurgitation was found in 34 patients (18%; 95% confidence interval [CI], 12%-24%); mild in 24, moderate in 9, and severe in one. The prevalence was significantly higher than expected from population data. Conduction system abnormalities were documented in 25 patients (13%; 95% CI, 8%-18%), and significantly more likely in the presence of aortic regurgitation ($P = .005$), which was related to increasing age and longstanding disease, and increased from ~20% in the 50s to 55% in the 70s. It was also independently associated with disease duration, with higher modified Stoke Ankylosing Spondylitis Spine Score, and with a history of anterior uveitis. HLA-B27 was present in similar proportions in the presence vs absence of aortic regurgitation. For comparison, clinically significant coronary artery disease was present in 9 patients (5%; 95% CI, 2%-8%).

CONCLUSION: Patients with ankylosing spondylitis frequently have cardiac abnormalities, but they more often consist of disease-related aortic regurgitation or conduction system abnormalities than manifestations of atherosclerotic heart disease. Because aortic regurgitation or conduction abnormalities might cause insidious symptoms not easily interpreted as of cardiac origin, we suggest that both electrocardiography and echocardiography evaluation should be part of the routine management of patients with ankylosing spondylitis.

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KEYWORDS: Ankylosing spondylitis; Aortic regurgitation; Disease activity; Echocardiography; Electrocardiography

There is an increasing interest in the link between chronic inflammatory disorders and atherosclerotic cardiovascular disease.^{1,2} This link was shown in a large cross-sectional

comparative database study in which cardiovascular disease was more common in patients with rheumatoid arthritis, psoriatic arthritis, and ankylosing spondylitis than

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EK and BGS contributed equally to this study.

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in controls.³ However, this study did not include aortic regurgitation and cardiac conduction abnormalities, which are not atherosclerotic but well known to occur in ankylosing spondylitis and other spondyloarthropathies.⁴ With a broader cardiovascular perspective, a population-based retrospective cohort study showed that aortic valvular disease and many other cardiovascular disorders were more common among 8616 patients with ankylosing than in a random sample of 1% of the population without ankylosing spondylitis; conduction abnormalities were, however, not specifically accounted for.⁵ Both aortic regurgitation and cardiac conduction abnormalities are, however, clinically important in the management of patients with ankylosing because they can cause insidious symptoms such as impaired physical capacity and fatigue that might be misdiagnosed or ascribed to noncardiac aspects of ankylosing spondylitis.

Echocardiography has become an indispensable tool in the evaluation of cardiac function. Echocardiography is usually performed through the chest wall (transthoracic echocardiography). One study of 29 patients with ankylosing spondylitis applied transthoracic echocardiography in all of them and transesophageal echocardiography in 9, while a subsequent study used the latter technique in all their 44 patients.^{6,7} Aortic regurgitation was observed in 10 of 29 patients (34%; 95% confidence interval [CI], 18%-54%) in the first and in 7 of 44 patients (16%; 95% CI, 7%-30%) in the second study, leaving a question about the "true" prevalence of aortic regurgitation among ankylosing spondylitis patients. Although transesophageal echocardiography gives excellent imaging of the heart, it is not suitable for clinical screening purposes because of increased risks, for example, in patients with stiff necks, esophageal disorders, and poor pulmonary function. It also requires sedation to reduce patient discomfort, and it is relatively resource demanding. Transthoracic echocardiography therefore was applied in this cross-sectional study of 187 patients with ankylosing spondylitis as part of a broad research protocol.⁸ The primary aim of our study was to define the prevalence of aortic regurgitation in a larger cohort of ankylosing spondylitis patients and use available population-based data on the expected prevalence for comparison. Because of the strong link between ankylosing spondylitis and the human leukocyte antigen (HLA) B27, and also between HLA-B27 and the combination of aortic regurgitation and cardiac conduction abnormalities,⁹ a secondary aim was to find out whether cardiac involvement in ankylosing spondylitis patients was linked to any specific HLA-B27 subtype or to any specific clinical features or measures of disease activity.

MATERIAL AND METHODS

Patients

All patients in whom ankylosing spondylitis was diagnosed according to modified New York criteria,¹⁰ at 3 rheumatology departments in the western part of Sweden, were invited to participate in a study evaluating skeletal health status, intestinal inflammation, and heart involvement. Exclusion criteria were psoriasis, inflammatory bowel disease, pregnancy, dementia, other concomitant rheumatic disease, and difficulties in understanding Swedish.⁸ Altogether, 210 patients were enrolled in an electrocardiography (ECG) study assessing a suggested link between cardiac conduction system abnormalities and disease activity.¹¹ They were also invited to undergo subsequent transthoracic echocardiography (from here: echocardiography) and 187 (89%) patients

consented (Figure). The study was performed according to the declaration of Helsinki, approved by the Regional Ethics Committee in Gothenburg, and the patients gave written informed consent to participate.

Rheumatologic Evaluation

Physical examination of all patients was made by one physician (EK) and included measurements of spinal mobility for the calculation of Bath Ankylosing Spondylitis Metrology Index. The patients answered questionnaires about medical history, medication, and smoking. Medical records were checked for diagnoses such as coronary heart disease, hypertension, hyperlipidemia, and diabetes. Disease activity was assessed using Ankylosing Spondylitis Disease Activity Score and Bath Ankylosing Spondylitis Disease Activity Index. Physical function was assessed by Bath Ankylosing Spondylitis Functional Index.¹² Lateral radiographs of the cervical and lumbar spine were acquired and scored for chronic changes using the modified Stoke Ankylosing Spondylitis Spine Score.¹³ Blood samples were analyzed by routine laboratory techniques. The presence of the HLA-B27 antigen and its alleles HLA-B2701 to HLA-B2738 were assessed by HLA typing with sequence-specific oligonucleotide primers (PCR-SSO) by LABType (One Lambda, Inc, Canoga Park, CA) on a Luminex platform. The mean level of erythrocyte sedimentation rate during the last 5 years was calculated using the first recorded erythrocyte sedimentation rate test for each year. If the medical records revealed that the patient had an infection, the concomitant erythrocyte sedimentation rate test was excluded and replaced by the subsequent test.

CLINICAL SIGNIFICANCE

- Aortic regurgitation was found in 18% of ankylosing spondylitis patients.
- Conduction abnormalities were more common in the presence of aortic regurgitation.
- Aortic regurgitation was associated with age and severity of ankylosing spondylitis.
- Echocardiography and electrocardiography should be part of routine care in ankylosing spondylitis.

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