

ECHOCARDIOGRAPHIC AND ELECTROCARDIOGRAPHIC ABNORMALITIES IN ANKYLOSING SPONDYLITIS

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SUMMARY

Twenty nine male patients with ankylosing spondylitis of 5-35 years duration were investigated with echocardiogram and electrocardiogram. Although myocardial systolic function were normal, diastolic functions were disturbed. Aortic root abnormalities and sub aortic bumpings, two cases with aortic incompetence and mitral valve prolapse were documented. Electrocardiographic abnormalities were found as atrioventricular conduction disturbances.

Echocardiography might be favorable diagnostic tool in rest or after exercises in ankylosing spondylitis for evaluation of cardiac involvement.

INTRODUCTION

Cardiac abnormalities have been documented in patients with ankylosing spondylitis (AS). Cardiomyopathy, electrocardiographic abnormalities and complete atrioventricular block have been reported (1,2,3,4,5,6). Aortic regurgitation is most frequently but mitral incompetence is rarely observed in these patients (7,8). Mortality is high among these patients due to cardiac and cerebrovascular disorders (9). These are very few investigations with doppler echocardiography in this subject.

In this study aortic and mitral incompetencies, electrocardiographic (ECG) abnormalities, myocardial disfunctions have been estimated with two dimension echocardiography and doppler echocardiography.

MATERIAL AND METHOD

Twenty nine male patients 28-69 (42.6 ± 5.6) with AS of 5-35 (14.5 ± 11.4) years duration were investigated. AS diagnosis was satisfied diagnostic criteria according to ARA(10). After taking an history of the illness, detailed physical examination was made. Patients with AS were divided to two groups. Group I consisted of 22 normotensive AS cases whose ages were between 28-63 (45.6 ± 11.5) and durations of the diseases 5-35 (16.9 ± 11.9) years. Hypertensive cases were regarded as another group. Seven hypertensive AS cases placed in group II, whose age ranges were 38-69 (52 ± 11.4) and durations of the diseases

Abbreviations : AS : Ankylosing Spondylitis ARA : American Rheumatism Association

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were 5-30 (17.5±8.2). Sixty two healthy male persons living in the same region and in same age group were defined as a control group (group III).

The echocardiogram images were obtained with Toshiba 1600 using 3,5 mHz echo probe. Echocardiography was undertaken with left parasternal long axis, short axis and apical position. Standard measurements of systolic and diastolic functions, systolic time intervals were derived. Valvular specifications were noted (2,7,11).

Exclusion criteria. Cases with diabetes mellitus, cigarette smoking, overt cardiac failure and angina pectoris were excluded.

Data analysis. Differences between each groups were examined by use of the Fisher's exact test of statistical significance for discrete variables.

FINDINGS

All AS cases diagnosis with ARA criteria were male and durations of diseases were 5-35 (14.5±11.4) years. High blood pressure levels were found in 7 (24.1%) cases. Except systolic murmur in mesocardiac area in only one cases no special physical findings were determined in group I. But two cases had anginal symptoms in group II.

In the evaluation of the electrocardiographic abnormalities; conduction disturbances were found to be most striking findings in group I (36.3 %) (Table I). Duration of AS were more than 10 years in patients with conduction disturbances. ST-T changes have been found in patients with anginal syndrome in group II (Table I).

Table I: ECG abnormalities in hypertensive and normotensive cases with AS

	Group I(N:22) n(%)	Group II (N:7) n(%)	GroupIII(N:62) n(%)
AV block	2(9.0)	-	1(1,6)*
LAFB	1(4.5)	-	-
LBBB	1(4.5)	1(14.2)	-
RBBB	4(18.1)	1(14.2)	1(1.6)*
ST-T changes		2(28.5)	1(1,6)*
VPB	1 4.5	1 14.2	1 6

AV block : First degree atrioventricular block, LBBB : Left bundle branch block, RBBB : Right bundle branch block, LAFB: Left anterior fascicular block, VPB: Ventricular premature beat

*p<0.05

Myocardial systolic functions were normal but diastolic functions were

disturbed in group I (18.1 %). Diastolic functional abnormalities were 85.7 % in group II ($p < 0.05$). Aortic root abnormalities, sub aortic bumpings were documented in case of group I and group II using echocardiographic techniques. Two cases with aortic incompetence and mitral valve prolapse (MVP) were asymptomatic (Table III).

Table II: Abnormalities of myocardial function in hypertensive and normotensive cases with AS and control group

	Group I (N:22) n(%)	Group II (N:7) n((%)
SD	-	-
DD	4(18.1)	6(85.7)*
LVH	1(4.5)	6(85.7)*
ASTI	-	-

SD : Systolic dysfunction, DD : Diastolic dysfunction, LVH : Left ventricular hypertrophy, ASTI : Abnormal systolic time intervals

* $p < 0.05$

Table III: Cardiac valve dysfunctions hypertensive and normotensive cases with AS and control group

	Group I (N:22) n(%)	Group II (N:7) n((%)
AI	2(9.0)	-
AC	4(18.1)	2(28.5)
MI	1(4.5)	1(14.2)*
ARD	1(4.5)	1(14.2)
AB	4(18.1)	3(42.8)*
MVP	2(9.0)	-
TI	1(4.5)	-

AI : Aortic Insufficiency, AC : Aortic Calcification, MI : Mitral Insufficiency, ARD : Aortic root dilatation, AB : Aortic bump (11), MVP : Mitral valve prolapse, TI : Tricuspid Insufficiency

* $p < 0.05$

DISCUSSION

AS is a chronic inflammatory disease that begins at sacroiliac joint and vertebral column in young people. HLA B27 type antigen commonly seen in cases of AS (12,13). Immune mechanisms play an important role in pathogenesis of the disease (14,15). Various organ disfunctions have been reported besides arthropathies in the course of AS (15). Particularly myocardium, aortic root and valves and cardiac conduction system have been involved in AS . It was underlined that these abnormalities are related with sex (16).

ECG abnormalities have been found in cases with more than 10 years duration. Mean duration of the diseases has been found approximately 25 years in the cases with AV block (17,18,19). Bergfeld et al (17) have been shown that conduction disturbances and AV block have been developed in 33 % and 9 % respectively. In our study complete AV block has not been seen in group I. But the other conduction disturbances are similar as previous investigations. This is because the duration of follow up period was the short and Holter monitoring was not performed in our cases. Additionally, it has known that conduction disturbances might be intermittent (20).

It has been recognized that decreased ventricular compliances have been caused diastolic function disturbances (21). Brewerton et.al.(21) reported diastolic abnormalities using echocardiographic techniques ,in 21 cases any systolic function disorder has been shown, but diastolic function disorders have improved during exercise (1). Serious diastolic function abnormalities have been shown during rest but systolic functions were normal in our study. It is remarkable that diastolic function abnormality incidence was high in hypertensive subjects. These disturbances have been explained increase of reticulum deposits in myocardial cells in literature (1). Ventricular hypertrophy has been reported in previous investigations. But its mechanism has not been explained clearly. In our cases ventricular hypertrophy seen with normal blood pressure supported that cardiac involvement was due to AS.

Aortic regurgitation has been reported to occur in 3 to 10 % of patients with AS about 15 years; after the onset of the disease. Mitral incompetence has been described rarely (7). The sub aortic bump has been defined as a characteristic lesion of AS(7). Sub aortic bump has been found out in cases of 16.6 and 27.7 % (11,12). In our study aortic bumps have been found 18.1 % in group I. That was similar as previous studies. It is remarkable that the aortic bump is nearly two fold in group II than literature findings.

Aortic root abnormalities have been described due to aortic wall inflammation in AS and aortic root abnormalities have been found in AS without clinical manifestation in the rate of 20-30 % (23,24). Aortic root abnormalities have

been established in the rate of 4.5 % in group I in the present study. Doppler echocardiography is known to be sensitive noninvasive test in investigation of valvular regurgitation and aortic root abnormalities . MVP may be cause of mitral regurgitation (25). Extension sub aortic bump to mitral valve and adjacent myocardium might produce mitral regurgitation (7). Mitral regurgitation has not been produced by mitral prolapse in our cases. O'Neill et al have described MVP in two cases out of 24 (26). In our study MVP has been found two out of 29 cases.

In summary, echocardiography might be favorable diagnostic tool in rest or after exercises in AS for evaluation of cardiac involvement. We believe that cardiac investigation have to be performed even if asymptomatic cases.

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