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Electrocardiographic and Echocardiographic Findings in Patients with Pulmonary Sarcoidosis

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ABSTRACT

***Background**: Sarcoidosis is a multisystemic granulomatous disease, in which cardiac involvement is one of the most important causes of death. Conduction abnormalities are the most common cardiac finding.*

***Materials and Methods**: Electrocardiographic and echocardiographic changes of 40 patients with pulmonary sarcoidosis who referred to a cardiac unit were evaluated. For all cases, a complete history, 12-lead ECG, and a transthoracic echocardiogram were achieved. None of them had history of underlying heart disease. Data analysis was performed using descriptive statistical parameters.*

***Results**: The study population included 24 females and 11 males with the mean (±SD) age of 47.8±8.6 years. Echocardiographic indices including systolic function and total cardiac function indices as well as the size of cavities and valves status were in normal limit in most patients. Only in 5% of patients, ejection fraction (EF) was slightly diminished. In 42.5% of cases, diastolic dysfunction was detected. Electrocardiographic evaluation showed first degree AV block only in one case and T inversion in leads V1-V6 in another subject.*

***Conclusion**: Our study showed that cardiac involvement presenting as electrocardiopraphic abnormality was seen in 2 cases. Diastolic involvement was a remarkable finding in our study. This as well as a slight decrease of 5% in EF requires further investigation. A study with a greater sample size, better follow up, and using other diagnostic means, can be helpful.*
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***Key words**: Sarcoidosis, Cardiac involvement, Extrapulmonary manifestations.*

INTRODUCTION

Sarcoidosis is a multisystemic granulomatous disease which more often involves lungs. Its extra pulmonary manifestations remain unrecognized usually due to nonspecific clinical signs and symptoms (1,2).

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Cardiac involvement is one of the most important complications during the disease. It is associated with poor prognosis and is a common cause of death particularly sudden death (3).

Although cardiac involvement is a common finding in autopsies, ante-mortem diagnosis usually does not occur. Among cardiac manifestations, atrial and ventricular arrhythmias, conduction abnormalities,

congestive heart failure, myocardial involvement like septal infarction, pericarditis, ventricular tachycardia, and left ventricular diastolic dysfunction are of greater importance. Cardiac conduction abnormalities are usually the most common findings. Standard clinical approach to these patients should be carried out on the basis of endomyocardial biopsy, echocardiography, nuclear medicine examinations, and electrocardiography (4,5,6,7).

Bear in mind the cardiac involvement during the course of sarcoidosis and also with respect to the relatively high number of patients referring to our center, the present study was designed to assessed the aforementioned complications in patients with sarcoidosis using their ecocardiographic and electrocardiograohic reports.

MATERIALS AND METHODS

Forty patients with definite pulmonary sarcoidosis referring to our cardiac unit were studied sequentially for one year. The age range of patients was 30-70. For all patients, a complete history, 12-lead ECG, and a transthoracic echocardiography (8) were achieved to assess the size of cavities, pericardial involvement, valves status, left ventricular systolic as well as diastolic function, and myocardial performance Tei index. All data recorded in special registration questionnaires. Electrocardiographic studies were performed by Schiller (Cardiovit-AT1) set and transthoracic echocardiography by Ving Med (CFM 750) with probe 3.25 Hz.

None of the cases had underlying heart disease Data analysis was performed by descriptive statistical parameters.

RESULTS

The study population included 24 females and 11 males with the mean (±SD) age of 47.8±8.6 years. Mean of LV ejection fraction which was considered as LV systolic function index, was 58.21±4.05.

Therefore, 38 patients (95%) were considered as good ventricular function group (EF>50%), and the remaining had partially decreased LV systolic function (40%<EF<50%). 4 patients (10%) had mild pulmonary hypertension (30mmHg<PAP<40mmHg). Tricuspid regurgitation was found in 2 patients (5%). Only in 1 (2.5%) patient, enlargement of right chambers (atrium and ventricle) was seen, and the other one revealed to have mild pericardial effusion.

To evaluate total cardiac function, Tei index was measured in both right and left sides. Mean of left and right Tei index was 0.39±0.2 and 0.37±0.18, respectively. (normal value for left Tei in subject>3 years is 0.33±0.02).

In all patients, early filling/atrial contraction (E/A) ratio was measured in order to evaluate diastolic function of left ventricle. E/A proportion of<1 was considered as LV diastolic dysfunction. Of 40 patients, 21(52.5%) had E>A, whereas E<A and E=A were reported in 17(42.5%) and 2(5%) patients, respectively. Two patients were found to have ECG changes: 1(2.5%) had first-degree AV block and 1(2.5%) had T-inversion in leads V1-V6.

DISCUSSION

Results have revealed that the only significant ECG changes were first degree AV block and non-specific ST-T changes. Our finding is similar to Gibbons et al. study (9). Considering the echocardiographic indices, diastolic dysfunction was more than the expected level, and slight decrease of EF in 5% of patients must also be noted.

Although interstitial granulomatous inflammation occurred during the disease can explain the cause of these two complications (10), more investigations particularly invasive and semi-invasive are needed to exclude drug induced-cardiomyopathy and age-related diastolic and systolic disorders. Long-term study dealing with prognosis and severity of cardiac involvement must be carried out in the future studies.

Slight increase (5%) in pulmonary artery pressure in this group guarantees better prognosis; however, this increment may progress during the disease, and it also explains for statistical study performed in patients who diagnosed along time ago (11,12). Larsen et al. have conducted a study dealing with 12-lead ECG abnormalities in 200 patients. Their results have shown that ST-T changes and first-degree AV block were the most common findings, especially at the beginning of the disease course (13). Uemura et al. nominated sarcoidosis is an important cause of mortality due to cardiac failure or sudden cardiac death. In their study, which was performed in Japan, the rate of cardiac involvement causing morbidity in patients was 47-78%. Furthermore, echocardiography, endocardial biopsy, and heart perfusion scan have been used for diagnosis and follow up in their study (3). With respect to prior reports and limitations of present study which consisted of absence of perfusion scan and endocardial biopsy, it appears that statistically significant difference does not exist in prevalence of cardiac involvement between our study and the others. However, we suggest a study with greater sample size, long-term follow up and also employing other standards diagnostic instruments.

REFERENCES

1. Rizzato G. Extrapulmonary presentation of sarcoidosis. ***Curr Opin Pulm*** 2001; 7(5): 295-7.
2. Hourigan LA, Burstow DJ, Pohlner P, Clarke BE, Donnelly JE. Transesophageal echocardiographic abnormalities in a case of cardiac sarcoidosis. ***J Am Soc Echocardiogr*** 2001; 14(5): 399-402.
3. Uemura A, Morimoto S. [Cardiac sarcoidosis]. ***Nippon Rinsho*** 2002; 60(9): 1794-800.
4. Duke C, Rosenthal E. Sudden death caused by cardiac sarcoidosis in childhood. ***J Cardiovasc Electrophysiol*** 2002; 13(9): 939-42.
5. Ishibashi H, Akasmatsu H, Sunamori M. [Cardiac sarcoidosis diagnosed by thoracoscopically resected lung nodule: report of a case]. ***Kyobu Geka*** 2002; 55(5): 437-9.
6. Matsumori A, Hara M, Nagai S, Izumi T, Ohashi N, Ono K, et al. Hypertrophic cardiomyopathy as a manifestation of cardiac sarcoidosis. ***Jpn Cric J*** 2000; 64(9): 679-83.
7. Fahy GJ, Marwick T, McCreery CJ, Quigley PJ, Maurer BJ. Doppler echocardiographic detection of left ventricular diastolic dysfunction in patients with pulmonary sarcoidosis. ***Chest*** 1996; 109(1): 62-6.
8. Sarac R, Agbaba-primorac R, Rozman A, Gomercic D. [Echocardiography in the diagnosis of cardiac sarcoidosis] ***Lijec Vjesn*** 1992; 114(5-8): 137-42.
9. Gibbons WJ, Levy RD, Nava S, Malcolm I, Marin JM, Tardif C, et al. Subclinical cardiac dysfunction in sarcoidosis. ***Chest*** 1991; 100(1): 44-50.
10. Brian D. Hito. Restrictive and infiltrative cardiomyopathies, in: HURST. Vol.2, 10th edition. New York: Mc Graw-Hill, 2001; Chapter 68: p: 1996.
11. Burstow DJ, Tajik AJ, Bailey KR, DeRemee RA, Taliercio CP. Two-dimensional echocardiographic findings in systemic sarcoidosis. ***Am J Cardiol*** 1989; 63(7): 478-82.
12. Click RL, Olson LJ, Edwards WD, Miller FA, Khandheria BK, Seward JB, et al. Echocardiogrphy and systemic disease. ***J Am Soc Echocardiogr*** 1994; 7(2): 201-16.
13. Larsen F, Pehrsson SK, Hammar N, Skold CM, Izumi T, Nagai S, et al. ECG-abnormalities in Japanese and Swedish patients with sarcoidosis. ***A Comparison Sarcoidosis vasc Diffuse Lung Dis*** 2001; 18(3): 284-8.