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ORIGINAL ARTICLE

The arrhythmic burden in patients with sarcoidosis. Is it a real concern?

Mohamed A. Abdelhamid, Haytham S. Diab *

Faculty of Medicine, Ain Shams University, Egypt

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KEYWORDS

Sarcoidosis;
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Ambulatory ECG (holter)

Abstract *Background:* Sarcoidosis is a multisystem disease characterized histologically by the formation of granulomas in many tissues. In many cases, cardiac involvement may be clinically silent but in others it may be the only clinical feature. Sudden death has been reported in 12–65% of cardiac sarcoidosis cases, and is usually attributed to malignant ventricular arrhythmias. We assessed the prevalence of cardiac arrhythmias in patients with sarcoidosis not complaining from cardiac symptoms aiming for early detection of cardiac involvement.

Methods: Fifteen patients with sarcoidosis (either thoracic or extrathoracic) were enrolled in the current study. Clinical diagnosis was based on tissue biopsy. All patients were symptoms free as regards their cardiac condition. Standard ECG was done for detection of bundle branch block (BBB), or atrioventricular block. 24 h ambulatory ECG (holter) was done to detect significant premature beats (> 10/h), runs of supraventricular or ventricular tachycardia (> 3 beats), or ventricular fibrillation. Echocardiographic examination was done for assessment of left and right ventricle systolic and diastolic function and significant segmental wall motion abnormalities (SWMA) (> 2 segments). All patients were under steroid therapy. Patients with a history of Ischemic heart disease, previous myocardial infarction (MI), congestive heart failure, electrolyte abnormalities, and patients with previously implanted permanent pacemakers or cardiac defibrillators were excluded from the study.

Results: Mean age of the study group was 49.6 ± 10.4 including 9 females and 6 male patients. Resting ECG was abnormal in 3 (20%) cases. Six patients (40%) had diastolic dysfunction however LV and RV systolic function and resting SWM were normal. No significant bradyarrhythmias were observed during holter monitoring however significant tachyarrhythmias including frequent premature atrial and ventricular beats, runs of non-sustained SVT and VT were observed in 5 patients. Life-threatening sustained VT was observed in a single patient that required Radiofrequency (RF) ablation followed by ICD implantation.

Conclusions: Holter monitoring provides a useful, convenient and inexpensive mean of non-invasive screening for cardiac involvement in sarcoidosis especially in patients without cardiac symptoms. Extended holter should be a part of the routine work-up of any patient with sarcoidosis. The

Abbreviations: ECG, electrocardiogram; LV, left ventricle; RV, Right ventricle; SWM, Segmental wall motion; SVT, Supraventricular tachycardia; VT, Ventricular tachycardia; ICD, Internal cardiac defibrillator; MRI, Magnetic resonance imaging; CS, Cardiac sarcoidosis; RF, Radiofrequency.

* Corresponding author at: Chest Department, Faculty of Medicine, Ain Shams University, Egypt. Tel.: +20 1224242708.
E-mail address: Haytham_Samy@yahoo.com (H.S. Diab).

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exact effect of steroid therapy on the arrhythmia burden remains a matter of debate. Cardiac MRI should be done to all patients with sarcoidosis having either abnormal symptoms or abnormal basic screening tools especially abnormal holter.

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Introduction

Sarcoidosis is a multisystem disease characterized histologically by the formation of granulomas in many tissues. The etiology of sarcoidosis remains unknown, although infectious agents and environmental exposures have been proposed [1].

Most patients present with pulmonary involvement of whom approximately half are asymptomatic presenting by hilar lymphadenopathy on chest X-ray [2]. Skin, followed by hepatic, gastrointestinal, ocular, and neurological affection, represents the commonest manifestation in decreasing order of frequency. Cardiac involvement occurs only in 2–5% of the cases and represents one of the least common manifestations [3–4].

However, survival with cardiac sarcoidosis has historically been poor. Sudden death has been reported as the second most common cause of mortality in patients with sarcoidosis in the United States. In autopsy studies, cardiac involvement was reported in up to 40–50% of patients [5–6]. Thus, it is likely that cardiac sarcoidosis is commoner than clinically recognized, although it remains a relatively uncommon disease [2].

In many cases cardiac involvement may be clinically silent but in others it may be the only clinical feature. Heart block is the most common arrhythmia, followed by bundle branch block. Ventricular tachycardia is less common, and atrial involvement alone is rare. Congestive heart failure occurs in 10–30% of cases. Sudden death occurs in 12–65% of cardiac sarcoidosis cases, and is usually attributed to malignant ventricular arrhythmias or complete heart block [7].

One of the main challenges for clinicians evaluating patients with systemic sarcoidosis is determining when and how to investigate for cardiac involvement. Owing to a low index of suspicion, and in some cases lack of pulmonary involvement, it may take many years before cardiac sarcoidosis is finally diagnosed. This is regrettable as cardiac sarcoidosis is readily treatable with corticosteroids, and because prompt diagnosis and treatment may prevent severe complications such as left ventricular dysfunction, heart failure, malignant arrhythmias, and even death [8].

In this limited study we assessed the prevalence of cardiac arrhythmias in patients with sarcoidosis (thoracic or extrathoracic) not complaining from cardiac symptoms aiming for early detection of cardiac involvement to prevent the occurrence of cardiac fibrosis that leads to fatal arrhythmias.

Patients and methods

Study population

Fifteen consecutive patients either admitted to general wards or visited outpatient clinics of the chest department at Ain University hospitals during the period from April 2014 to May 2015 were enrolled in the current study. Clinical diagnosis of sarcoidosis in all cases was based on histopathological examination of tissue biopsy as shown in Table 1. Patients with a history of Ischemic heart disease, previous MI, congestive heart failure, electrolyte abnormalities, and patients with implanted permanent pacemakers or cardiac defibrillators were excluded from the study. Informed consent was obtained from all patients. The study was approved by the Research and Ethics Committee of the Chest Department, Faculty of Medicine, Ain Shams University at April 2014.

Methods

Detailed history and full clinical examination was done for all patients with special emphasis on the presence of palpitation, presyncope, or true syncope. Palpitations were considered significant if the patients' complaint lasted >2 weeks [9]. Serum electrolyte and oxygen saturation assessment were done to exclude other causes of arrhythmia.

Electrocardiogram (ECG)

Standard 12 lead ECG was done for recording of resting abnormalities. Abnormal resting ECG was defined as the presence of conduction defect as bundle branch block (BBB), interventricular conduction delay (IVCD), or atrioventricular block of any degree or any other arrhythmias (atrial or ventricular) [7].

Table 1 Clinical and demographic features among the study group.

Items	Mean ± SD/frequency
Age	49.6 ± 10.4
Sex	
Female	9 (60%)
Male	6 (40%)
Clinical symptoms	
Dyspnea	12 (80%)
Dry cough	11 (73%)
Wheezy chest	7 (46%)
Palpitations	1 (6.6%)
Tissue biopsy	
Med. LN. biopsy by mediastinoscope	10 patients (66.6%)
Lung biopsy through thoracotomy	3 patients (20%)
Skin lesion biopsy	2 patients (13.3%)

Med. LN.: Mediastinal lymph node.

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