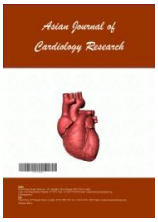

Asian Journal of Cardiology Research

4(4): 13-17, 2021; Article no.AJCR.68453

A Rare Case of Reversible Complete Heart Block in a Young Man: Lesson Learned

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Authors' contributions

This work was carried out in collaboration among all authors. Author PG designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors GC and DM managed the analyses of the study. Author BD managed the literature searches. All authors read and approved the final manuscript.

Article Information

Editor(s):
(1) Dr. Scicchitano Pietro, F. Perinei Hospital, Italy.
Reviewers:
(1) Surendra Patel, All India Institute of Medical Sciences (AIIMS), India.
(2) Saurabh Ajit Deshpande, Kerala University of Health Sciences (KUHS), India.
Complete Peer review History: http://www.sdiarticle4.com/review-history/68453

Case Report

Received 10 March 2021
Accepted 14 May 2021
Published 17 May 2021

ABSTRACT

30-year-male presented with a complaint of palpitation and easy fatigue for 10-days. He has a history of fever 4-weeks back. On examination had a pulse rate of 44/min and occasional canon a wave on jugular-venous-pulse examination. Rest cardiovascular examination was unremarkable. His 12-lead-ECG showed complete heart block. He was admitted and evaluated for the same at this young age.

Keywords: Complete heart block; myocarditis; cardiac MRI.

ABBREVIATIONS

CHB : Complete heart block
CMR : Cardiac magnetic resonance imaging
LVEF : Left ventricular ejection fraction
AV block : Atrioventricular block

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ELISA : Enzyme-linked immunosorbent assay
JVP : Jugular venous pressure
IV : Intravenous

1. INTRODUCTION

Complete heart block (CHB) is a life-threatening event which if not intervened could be fatal, It is seen mostly in elderly people due to the degenerative conduction system but when encountered in young the differentials widen and thorough investigation is necessary. The prevalence of CHB in young is 0.04%.[1] Of all pacemakers implanted 3-5 % are aged 18-55years [1]. We present a case of a young patient who presented with complete heart block and with proper evaluation turned out to be Lymes myocarditis-associated heart block and reverted to normal sinus rhythm.

2. CASE PRESENTATION

A 30-year-old male, manager of a restaurant without any known cardiac illness presented with episodes of palpitation and easy fatigability for 10 days. There was no history of pre-syncope, syncope, chest pain, or dyspnea at presentation The Patient had a history of fever 4 weeks back which was treated with oral antibiotics. Any history of insect bite, mosquito or tick bite, or history of any rash over the body was looked for but was not found. He was afebrile, blood pressure 122/70 mmHg with a heart rate of 44/ min regular. Cardiac examination was unremarkable except for occasional cannon “a” waves on jugular venous pulse. All laboratory parameters were normal, viral markers were negative and no elevation in cardiac biomarkers. The electrocardiogram showed complete Atrio-ventricular dissociation with an atrial rate of 100/minute ventricular rate of 38/minute with a QRS duration of 140 msec Fig. 1a. No structural abnormality in echocardiography with LVEF of 55% without any regional wall motion abnormality. On continuous telemetry monitoring his heart rate was maintained between 45-50/min and there was no evidence end-organ hypoperfusion, Serum lactate was normal hence managed conservatively. Differentials were cardiomyopathy, autoimmune, infiltrative disorders, coronary artery disease, or infective etiology. His coronary angiogram was normal, the autoimmune profile was negative. Hence Cardiac magnetic resonance imaging (CMR) was planned which showed patchy subepicardial enhancement suggestive of myocarditis Fig. 2a. Lymes serology was positive with elevated titers for IgG antibodies. The patient was started on Inj ceftriaxone 1 gm IV twice daily and oral steroids tab prednisolone 1mg/kg/day and kept on continuous monitoring. Third-degree AV block reverted to first-degree AV block and then to Normal sinus rhythm within 7 days Fig. 1b. His CMR was repeated 6 weeks after the therapy which showed resolving changes.

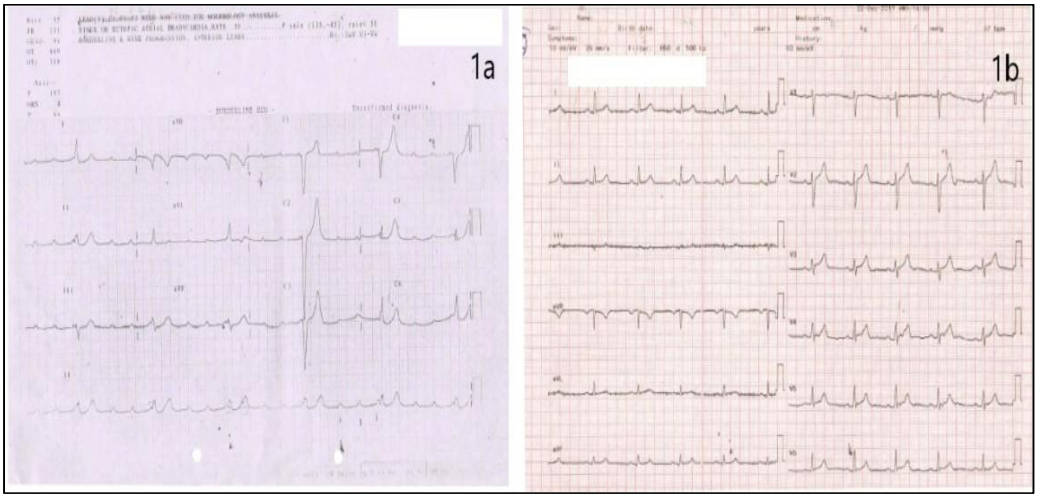

Fig. (1a). The electrocardiogram showed complete AV dissociation with an Atrial rate of 100/min ventricular rate of 38 with a QRS duration of 140 ms. (1b) Normal sinus rhythm with a heart rate of 70 QRS of 120 ms

Fig. 2. Showing sagittal view, cardiac MRI of the heart showing patchy subepicardial enhancement of gadolinium in mid interventricular septum suggestive of myocarditis

3. DISCUSSION

AV block in young patients is not a routine encounter in clinical practice if found is associated with either Myocardial ischemia, myocarditis, Infiltrative diseases, Cardiomyopathy, Medication, cardiac surgery, or Idiopathic [1]. Presentation of a patient with high-grade AV block at a young age is common however finding out the etiology for the same is a challenge. Very often it is seen that without further investigation patients are submitted to pacemaker implantation, It is necessary to evaluate and establish the cause of AV block. In young patients getting Pacemaker implantation apart from its immediate and late complications, there are also significant risks from the replacement or up-gradation of the device [2]. The patient was hemodynamically stable so kept on continuous cardiac monitoring and on further investigation found to have Lyme's Myocarditis causing the AV block. Lymes disease is caused by Spirochetes like Borrelia burgdorferi, B. afzelli, and B. garinii [3]. Lyme disease is a common tick-borne disease in the northern hemisphere, uncommonly found in India [4]. Lyme's carditis is one of the common reasons for third-degree AV block in young patients with no prior cardiac disease, However, Lyme's carditis is a rare condition. Those infected with borrelia clinical features are seen in only 0.3–1.4%,3–6% test positive with Lyme's serology and produce specific antibodies [5]. Lyme carditis manifest between 4 days to 7 months after tick bite [5]. In the existing literature, it was found that males are affected more than females [6]. Lymes carditis presents with angina, dyspnea, and feature of heart failure, palpitations, dizziness, and syncope [7]. Heart blocks are common conduction disturbances in Lyme's disease and are fluctuating in nature some tend to develop dilated cardiomyopathy, left ventricular dysfunction, and pericarditis which resolves on their own6. Commonly Heart block is located above the bundle of His, typically in the atrioventricular node [7]. The diagnosis is based on the recognition of characteristic clinical findings, Serologic based on the detection of IgG- and IgM-antibodies in the serum. although negative results can be found in the early state. Both IgM and IgG antibodies can be detected using ELISA and

immunoblot assays. Test results should be correlated clinically because of false-negative results in the early stage. Whenever in doubt and having a high index of suspicion testing should be repeated within 6 weeks [8]. In our patient serology was tested for Lyme disease. A transthoracic echocardiogram is the primary imaging modality for the assessment and is done mainly to evaluate the LV function and to look for associated structural heart disease. In our case, the Echo was a normal study which is usually a finding in Lymes disease, but echo is also helpful to observe for the development of dilated cardiomyopathy in chronic Lyme carditis. Cardiac MRI (CMR) characterizes tissue well with accurate delineation of ventricular size and function, so it helps to pick up the etiology. Its also helpful for follow-up of myocarditis and provides reliable information with ruling out etiologies like Sarcoidosis, amyloidosis. Positive serology for lymes disease prompted us to go for cardiac MRI, which helped and brought us to confirmation of the diagnosis of myocarditis [9]. Most symptoms are usually self-limiting and antibiotics shorten the clinical courses and avoid complications. Patients may be safely treated with oral doxycycline, amoxicillin, or cefuroxime. Those high-grade AV block, intravenous ceftriaxone therapy for 2–4 weeks is preferred. Other options are IV cefotaxime or high-dose penicillin G 3. The patient was started on IV ceftriaxone 2g twice a day for 2 weeks as well as oral steroids and the patient showed improvement with reversal of heart block within 1 week of therapy. The patient was and followed up with repeat CMR after 6 weeks which showed improvement and reduction in edema in the myocardium. Conduction disturbances of Lyme disease have a favorable prognosis. Most symptoms are usually self-limiting and antibiotics shorten the clinical courses and avoid complications. Lyme's disease-causing conduction abnormality can be reversed with the use of antibiotic therapy. So every young patient presenting with conduction abnormality should be evaluated to reverse disease in early phases and avoid Permanent pacemaker implantation. The temporary pacemaker implantation may be required in patients who become unstable, whereas a permanent pacemaker is rarely needed.

4. CONCLUSION

Lymes disease is a rare encounter in our daily practice and conduction disturbance can be reversed with timely intervention. A proper workup and focused management will avoid placement of a device in the young patient which has its complication.

LEARNING POINTS

A thorough evaluation with a focus on looking for the reversible cause is a must in every case. Think twice before intervening with young patients as it may have long-term implications.

CONSENT

Consent to participate in the study has been taken from the patient and her parents. The participant and her parents have consented to the submission of the case report to the journal.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/68453