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Case Report

Rare Presentation of Common Disease: A Rare Case of Dual Valve Endocarditis Due to Tuberculosis- Case Report

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Abstract

Mycobacterium tuberculosis is the leading cause of deaths due to a single infectious agent globally. It may affect every organ in the body except nails and hair. Cardiac involvement with tuberculous endocarditis is extremely rare manifestation with high mortality. Here we present a unique case of tuberculous endocarditis involving mitral and aortic valves in the background of pulmonary tuberculosis, which resolved solely with antituberculous medication in patient from Sri Lanka.

Keywords: Mycobacterium Tuberculosis; Endocarditis; Antituberculous Treatment

Introduction

Tuberculosis is an infectious disease caused by the bacillus *Mycobacterium tuberculosis*. More than 1.7 billion people (about 25 percent of the world population) are estimated to be infected with *M. tuberculosis* resulting in latent tuberculosis [1]. Even though it typically affects the lungs (pulmonary TB), it can also affect any other site of the body (extrapulmonary TB). Tuberculous valvular endocarditis is extremely rare, mostly reported in autopsy series [2]. In 1826, Laennec was the first to describe cardiac tuberculosis, assigning the heart as the 13th organ affected in the order of frequency [3].

However, in the published literature, tuberculous endocarditis is exceptionally rare [4]. Here we present a case of disseminated tuberculosis with mitral and aortic valve endocarditis.

Case presentation

A sixty year old male who was diagnosed to have type 2 diabetes mellitus for 4 years with poor glycemic control, was referred to respiratory disease treatment unit with fever and cough for 6 weeks duration associated with loss of appetite and weight loss of 5 Kg over one month. There was no past or contact history of tuberculosis. Physical examination revealed that he was febrile (temperature 38.2c) and ill looking. He had tachycardia with a pulse rate of110 beats per minute and a respiratory rate of 32 cycles per minute. Peripheral oxygen saturation in room air was recorded as 95% on admission. Cardiac auscultation revealed a soft pansystolic murmur radiating to the left axilla. There were course crepitations in both lung fields mainly left upper and right mid zone with bronchial breathing.

Laboratory data revealed erythrocyte sedimentation rate of 120mm/ 1st hour, C-reactive protein (CRP) of 142mg/dl (normal <6), haemoglobin 11.1g//dl, white blood cells 13200 per ml with 83% neutrophils, serum creatinine1.1 mg/dl, normal urine full report and random blood sugar 234mg/dl. Investigations for vasculitis including Anti Nuclear antibodies (ANA), Rheumatoid factor, c- ANCA and p-ANCA were negative. Electrocardiogram revealed sinus tachycardia only. Chest X ray demonstrated cavitatory consolidations in left upper and right mid zone. (Figure 1). Transthoracic echocardiography revealed an echogenic mass attached to the tip of the anterior mitral valve leaflet measuring 5× 5mm and another

mass attached to the non coronary cusp of the aortic valve measuring 8 ×4mm with mild to moderate mitral regurgitation and mild aortic regurgitation (Figure 2). However a series of six sets of blood cultures, drawn prior to commencement of antibiotics and incubated for an extended period, were negative. However, three consecutive samples of sputum for acid fast bacillus and sputum for MTB GeneXpert were positive. Moreover, *Mycobacterium tuberculosis* genetic materials were extracted from blood using Boom's method and amplified using specific primers (pt8 and pt9) indicating disseminated tuberculosis (Figure 3).

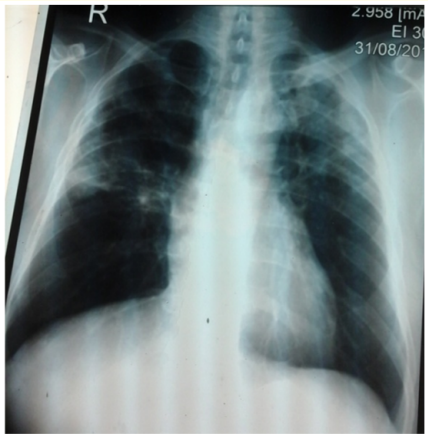

Figure 1: Chest X-ray showing bilateral consolidations and cavitation.

Figure 1: Lane 1: 100 bp ladder.
Lane 4 and 5: PCR product of DNA extracted from blood.

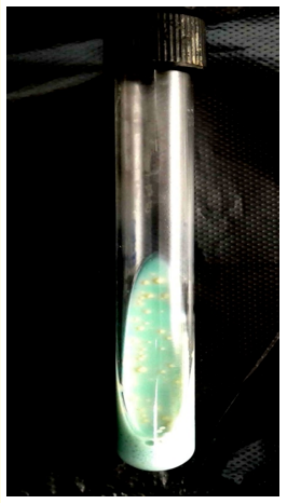

Figure 3: Culture isolate LJ medium.

Diagnosis of disseminated tuberculosis with pulmonary and cardiac involvement was made, and World Health Organization (WHO) category 1 treatment with fixed drug combination of isoniazid, ethambutol, rifampicin, and pyrazinamide was commenced without other antibiotics. Glycaemic control was achieved with soluble insulin initially followed by oral hypoglycaemic agents. His clinical symptoms improved with resolution of fever and improvement of appetite by day 3 of antituberculous treatment, however, his cough persisted for which symptomatic medication was prescribed. CRP started to decline after one week of treatment. Follow up echocardiogram done after one month of treatment demonstrated regression of cardiac vegetations leaving only mild calcification in both aortic and mitral valves with resolution of previously noted aortic and mitral regurgitation. Meanwhile his inflammatory markers normalized by one month of anti tuberculous medication with complete resolution of clinical symptoms while achieving weight gain. Currently he is being followed up in the clinic with a plan of continuing antituberculous medication for 12 months.

Discussion

Tuberculosis a multisystem disease with myriad of clinical manifestations, since *Mycobacterium tuberculosis* bacilli can affect any organ or tissue, except the hair andnails [5]. Involvement of the lung parenchyma is definedas pulmonary tuberculosis, which is the

commonestclinical manifestation. Extrapulmonary tuberculosis is when disease involves organs other than lung and conduction airways [6]. Though the proportion of extrapulmonary tuberculosis varies geographically, 16% of all cases of tuberculosis recognized by WHO in 2017 were extrapulmonary [7]. Lymphadenopathy is the commonest extrapulmonary manifestation followed by pleural effusion [8].

Tuberculous endocarditis is reported exceedingly rarely in published literature [4,9]. Lennac was the first to describe cardiac tuberculosis in 1826 [3]. It is a deadly disease with very high mortality and most cases were reported from autopsy series [9]. This study, to best of our knowledge, represents the first reported case of tuberculous endocarditis in Sri Lanka.

Endocardial involvement due to mycobacteria usually occurs in the context of military TB in immunocompromised patients such as acquired immunodeficiency syndrome (AIDS) and glucocorticoid therapy [4]. Few cases of tuberculous infection in prosthetic valves have been reported [10]. However, immunocompetent hosts are not exceptional, since some cases of tuberculous endocarditis have been reported in immunocompetent patients recently [9,11]. Our patient suffered from poorly controlled diabetes mellitus, which may be responsible for diminished immunity against mycobacteria leading to disseminated infection.Single valve involvement was predominately observed in published cases [4,11] However, both mitral and aortic valve endocarditis was present in our patient. Nakamura Y., *et al*. reported a case of dual valve disease with aortic and mitral valve endocarditis before [12]. Furthermore, a case of triple valve endocarditis with aortic, mitral and tricuspid valve involvement in an immunocompetent patient was described by Shaikh., *et al*. [9].

Confirmation of mycobacterial aetiology for endocarditis is extremely challenging due to limitations of microbiological investigations. In many cases the diagnosis was arrived from evaluation of surgical or autopsy samples of valves for histopathological or microbiological evidence. Since our patient was improved with antituberculous medications, pathological sampling was not undertaken. However, PCR for *Mycobacterium tuberculosis* was positive in blood indicating disseminated infection in the background of bacteriologically confirmed pulmonary tuberculosis. The place of PCR for rapid diagnosis of tuberculosis has been evaluated in several studies. Genetic material of mycobacteria can present in blood even in localized diseases. The overall sensitivity of PCR in blood in suspected or proven cases of pulmonary or extrapulmonary tuberculosis was generally low, ranging from 20-95.7%, while having high specificity; 94.4-100% [13-15]. Even though, identification of DNA of mycobacteria in blood with PCR method is not confirmatory of tuberculous endocarditis, the disappearance of vegetations in both valves with antituberculous medications without antibiotics provides sufficient clinical evidence for the diagnosis in our case.A review by Shi-Min Yuan isolated *Mycobacterium tuberculosis* only in two out of 22 cases of confirmed mycobacterial endocarditis [16]. It further revealed *Mycobacteriumfortuitum, Mycobacteriumchimaera* and *Mycobacteriumabscessus* as the commonest aetiology for Mycobacterial endocarditis. Therefore, PCR based investigations may be useful in precise identification of mycobacterial organism, thereby initiation of appropriate therapy. However, thorough and systematic investigations should be carried out to exclude all other possible cases of culture negative bacterial endocarditis prior to assign the diagnosis of tuberculosis.

Historically, the prognosis of tuberculous endocarditis had been dismal with high mortality. Survival in many cases due to advancement of surgical interventions together with effective antituberculous medications are reported in recent literature [4,9,11,17]. Though many patients require surgical debridement and valve replacement, medical therapy with antituberculous medications alone was sufficient in our patient, possibly due to early identification and initiation of appropriate treatment. AR Spurnić., *et al*. successfully managed a patient with tuberculous tricuspid endocarditis with AIDS using medical therapy alone given for total of 11 months [17]. The regime of four antituberculousdrugs (isoniazid, ethambutol, rifampicin, and pyrazinamide) for 2 months and followed by isoniazid and rifampicin for 10 months was administered for successful management of mitral valve endocarditis by Sultan FA., *et al* [11]. We planned to continue treatment for 12 months in our patient.

Conclusion

Tuberculous endocarditis is extremely rare, but a deadly disease. It is often under recognized till advance complication develops due to lack of suspicion and difficulty in microbiological and pathological diagnosis. High degree of suspicion should be main-

tained even in immunocompetent patients to avoid delayed diagnosis and disastrous consequences especially in endemic areas.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal

Competing Interest

The authors declare that they have no competing interest.

Authors' Contribution

DM made the clinical diagnosis and supervised the manuscript drafting. AB, SD, SS and LB drafted the first manuscript, reviewed the literature and involved in direct management of the patient. All authors read and approved the final manuscript.

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Volume 2 Issue 9 September 2019