

Original research article

Cardiac involvement in tuberculosis: An underdiagnosed entity

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ABSTRACT

INTRODUCTION- Tuberculosis (TB) is still a leading cause of death worldwide. It can affect any organ. However, cardiac involvement is extremely rare.

OBJECTIVE- This study was done to determine the frequency of cardiac involvement in TB in medico-legal autopsy cases.

METHODS- This was a cross sectional descriptive study done over a period of 18 months from Jan 2018 to June 2019. We analysed 3600 medico-legal autopsy cases sent for histopathology over this period. Out of 3600 cases, 70 cases were found positive for tuberculosis either pulmonary or extra pulmonary involvement.

RESULTS- Out of 70 positive TB cases, 23 cases (32.85%) had cardiac involvement. Among 23 cases having cardiac involvement, 9 cases (39.1%) showed myocardial involvement, of which concomitant pericardial involvement was noted in 6 cases (8.6%). 20 cases (28.5%) showed pericardial involvement. Isolated pericardial involvement of heart in absence of involvement of any other organ was seen in only 2 cases (2.9%).

CONCLUSION - Tuberculosis is a curable disease, failing to diagnose this curable disease causes unnecessary death. Clinicians should have a high index of suspicion regarding cardiac tuberculosis in any patient of tuberculosis because it mandates treatment for extra-pulmonary TB. In our study, cardiac involvement is seen in 23(32.8%) of 70 cases at autopsy. This finding sheds light on the need for more awareness of the disease.

Key words: Tuberculosis, Extra pulmonary, Myocardium, pericardium

Introduction

TB was detected as far back as 10,000 BC and it still remains a major health problem worldwide, which is often not diagnosed during the lifetime of a patient. As per the Global TB report 2017, estimated incidence of TB in India is approx. 28,00,000 accounting for about quarter of world's TB cases^[1]. TB affects almost every organ in the body but the usual site of the disease is the lungs. It spares few organs in body including thyroid, heart, pancreas and skeletal muscle^[2]. The involvement of extra pulmonary sites is usually associated with increased morbidity and mortality. With HIV co-infection, the disease patterns has changed with a higher incidence of disseminated and extra pulmonary involvement^[3]. One to two percent of patients with TB also have cardiovascular involvement. It mainly affects the pericardium^[4], but very rarely are the myo-endocardium, and the valves involved. The earliest case of myocardial tuberculosis was reported in 1664 by Maurocordat, a Turkish physician^[5]. The exact mechanism of myocardial involvement^[5] is not clear. However, the common proposed mechanisms include hematogenous or lymphatic spread or directly from the contagious structures^[6]. Due to stigma associated with TB disease, in many cases of active TB, either there is delay in the diagnosis or proper treatment leading to an unrestricted exposure of tubercular bacilli to environment^[7]. Cardiac involvement in TB usually presents with miliary or disseminated tuberculosis. Many of the cases may go undetected and are diagnosed only

after an autopsy is performed. Very few studies have been reported regarding the cardiac manifestations of tuberculosis. The present study is an effort in the direction of knowing the frequency of cardiac involvement in TB.

Materials and Methods

This is a cross sectional descriptive study, conducted in Autopsy Section of Department of Pathology in a tertiary care hospital. This study spans a duration of 18 months from January 2018 to June 2019. The post-mortem examination was performed at Department of Forensic Medicine by a forensic expert and representative pieces or wholes of organs were submitted in 10% formalin for histopathological examination to the Department of Pathology along with whatever available history, clinical details and gross findings. Representative sections taken and tissue processed for histopathological examination. Slides were stained with Haematoxylin & Eosin stain. Ziehl-Neelson stain was done in all of 70 cases and Periodic Acid- Schiff (PAS) stain was also done, wherever necessary. Microscopic findings were recorded.

The criteria for acceptance of a case as tuberculosis includes presence of granulomatous inflammation and/or demonstration of acid fast bacilli on ZN stain.

Exclusion criteria includes autolysed cases, Fungal infections and other non-infectious causes of granulomatous diseases which were excluded by careful microscopic examination and application of special stains wherever required.

A total of 3600 such medico-legal samples were received during the study period. Out of the 3600, 70 cases with histopathological evidence of Tuberculosis were included in our study. Thus, frequency of TB in local autopsy service was 1.94%.

Results and Observation

A total of 70 cases came to be positive for tuberculosis (1.94%). Among the 70 cases which were positive for tuberculosis, 64 cases (91.42%) had pulmonary involvement with or without extra-pulmonary involvement and 6 cases (8.57%) had only extra-pulmonary involvement. 28 cases (40%) showed only pulmonary involvement, 1 case (1.42%) showed isolated liver involvement, 3 cases (4.28%) showed isolated brain involvement and 2 cases (2.85%) showed isolated heart involvement in the form of TB pericarditis. Among 70 positive TB cases, 23 cases (32.85%) had cardiac involvement. Out of 23 cases having cardiac involvement, 9 cases (39.1%) showed myocardial involvement, of which concomitant pericardial involvement was noted in 6 cases(8.6%). 20 cases (28.5%) showed pericardial involvement. Isolated pericardial involvement of heart in absence of involvement of any other organ was seen in only 2 cases(2.9%).

The majority of TB cases presented with sudden death (n=40; 57.14%); of which 10 were brought dead to mortuary; in these cases it was presumed that the death was sudden since they did not seek medical advice for their illness leading to death. Others presented with fever, cough or chest pain. Out of 23 cases having cardiac involvement, 15 cases (65.21%) were of female and 8 (34.78%) were male. Most of these cases were in the 3rd decade of life. Out of 9 cases having myocardial involvement, 1 cases (11.1%) showed nodular pattern of involvement, 2 (22.2%) showed military pattern of involvement and 6 cases (66.7%) showed diffuse infiltrative pattern, showing infiltration of the myocardium associated with tuberculous pericarditis.

On microscopic examination, sections from both myocardial and pericardial areas revealed epithelioid cell granulomas, Langhan's type of giant cells and mononuclear cell infiltrate in all the cases. Caseous necrosis was seen 18 cases(78.3%) and Ziehl-Neelsen staining for acid fast bacilli using 20% H₂SO₄ was also positive in sections from heart in 15 cases(65.2%). Even though the ZN stain was negative in 8 cases (34.8%), they are included because in all those cases ZN stain was positive in lung sections and there was typical granulomatous lesion in heart.

Discussion

Heart is considered to be resistant to tuberculosis and its exact reason is not known. However, it has been suggested that constant movement of myocardium is not conducive to lodgement of tubercle bacilli [8]. Although there is decline in global incidence of TB, it still remains as one of the most prevalent infectious etiology around the world. In cardiac tuberculosis pericardium is more commonly involved than the myocardium [8] which is consistent with our study. Tuberculous involvement of myocardium is quite rare, and the prevalence of the reported isolated myocardial tuberculosis is 0.14%, 0.2% and 2% in various series and it generally occurs in conjunction with pericardial involvement. [9]. The cases of isolated myocardial involvement in our study was not seen in any of the cases. While involvement of myocardium with pericardium was seen in conjunction with involvement of other organs. Isolated TB pericarditis was seen in 2 cases(2.9%).

Cardiac involvement is usually seen as the result of dissemination from lesions elsewhere in the body. Myocardium may be affected by direct spread from the mediastinal lymph nodes or tuberculous pericarditis or it may be affected as part of military tuberculosis or as a result of retrograde lymphatic spread and hematogenous spread [10]. In the 23 cases of cardiac involvement in our study, 21 were of dissemination which is consistent with other studies. Antemortem diagnosis of tubercular myocarditis is rare due to the lack of awareness and delayed diagnosis is because of non-specific symptoms including fever, fatigue, night sweats, weight loss, cough, chest pain, breathlessness. Predisposing factors for the development of this dissemination infection include advanced age, immunosuppression in cases of HIV, chronic renal failure, organ transplantation or corticosteroid therapy [11-15].

In our study, the age range was from 25 to 35 years which is similar to many reported cases where it similarly affects young individuals. [5-8] Tuberculosis is increasing at a faster rate and lack of treatment leads to its dissemination into other organs including heart. The diagnosis of such cases is missed or delayed due to either absence of specific symptoms or lack of investigations in patients for the suspicious symptoms [15]. This study is unique in that as till now very few case reports are regarding cardiac involvement in TB. There is paucity of literature of this scale and more research need to be carried out towards this increasing prevalence of cardiac tuberculosis.

Limitations

The short coming of this study was non receipt of immune status and medical history of the cases because of medico legal nature of cases, which if overcome would be a more useful tool in understanding the pattern and spread of disease, especially in heart which is considered resistant to TB.

Conclusion

Tuberculosis is a curable disease failing to diagnosing this curable disease causes unnecessary death. Clinicians should have a high index of suspicion regarding cardiac tuberculosis in any patient of tuberculosis because it mandates treatment for extrapulmonary TB. In our study, cardiac involvement is seen in 23(32.8%) of 70 cases at autopsy. This finding sheds light on the need for more awareness of the disease.

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