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Retrospective assessment of the patients with disseminated tuberculosis

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Abstract---Background: Disseminated tuberculosis (TB) is defined as the presence of two or more noncontiguous sites resulting from hematogenous dissemination of *Mycobacterium tuberculosis*, occurring as a result of progressive primary infection, reactivation of a latent focus with subsequent spread, or rarely through iatrogenic origin. Hence; the present study was undertaken for assessing the patients with disseminated tuberculosis. Materials & methods: A total of 50 patients who reported to the department and were confirmed with diagnosis of disseminated tuberculosis in the past one year. Complete demographic and clinical data of all the subjects was enrolled. Clinical profile of all the patients was recorded. Assessment of all the results was done using SPSS software. Results: Fever, malaise, weight loss and poor appetite were seen in 66 percent, 30 percent, 24 percent and 20 percent of the patients respectively. Cough, dyspnea, myalgia and joint pain was seen in 20 percent, 12 percent, 14 percent and 18 percent of the patients respectively. On chest imaging, consolidation, fibrotic change, miliary lesion and nodular change was seen in 16 percent, 10 percent, 50 percent and 8 percent of the patients respectively. Conclusion: Majority of the patients demonstrate clinical findings suggestive of disseminated TB. Combined mycobacterial culture and histopathologic examination of biopsy from bone marrow were more sensitive and faster than mycobacterial blood culture in diagnosing disseminated TB.

Keywords---disseminated tuberculosis, acid-fast, Bacilli.

Introduction

Disseminated tuberculosis (TB) is defined as the presence of two or more noncontiguous sites resulting from hematogenous dissemination of *Mycobacterium tuberculosis*, occurring as a result of progressive primary infection, reactivation of a latent focus with subsequent spread, or rarely through iatrogenic origin. Nowadays, the term miliary TB also refers to progressive and widely spread forms of TB. It entails a hematogenous spread of the disease to several organs, even if the classical pathologic or radiologic findings are absent.^{1, 2} Disseminated TB is a life-threatening condition, especially if the diagnosis and treatment are delayed. The diagnosis is difficult because of its nonspecific clinical picture and the paucity of tools available for confirmatory laboratory diagnosis, such as low sensitivity of acid-fast bacilli (AFB) smear, time-consuming cultures, and the inability to easily detect miliary changes in chest X-ray.^{3- 5}

Disseminated TB (dTB) has been increasingly observed in immunocompromised hosts, especially in developing countries, where dTB is a major cause of morbidity and mortality due to higher rates of TB-human immunodeficiency virus (HIV) co-infection. It is often difficult to establish diagnosis, and the clinical presentation of dTB is commonly non-specific, with symptoms varying according to the affected organs. Retinal choroidal tubercles are a pathognomonic finding of dTB, they are identified in only about 5–20% of the cases. Similarly, the classic chest X-ray features of miliary TB may help in the diagnosis, although less than a third of dTB patients may present them. Thus, diagnostic delay is probably one of the main reasons why dTB is associated with higher mortality rates than pulmonary TB (pTB).^{6- 8} Hence; the present study was undertaken for assessing the patients with disseminated tuberculosis.

Materials and Methods

The present study was undertaken for assessing the patients with disseminated tuberculosis. A total of 50 patients who reported to the department and were confirmed with diagnosis of disseminated tuberculosis in the past one year. Complete demographic and clinical data of all the subjects was enrolled. Disseminated TB was diagnosed if the patient had any of the following conditions:

- Isolation of *Mycobacterium tuberculosis* from blood, bone marrow, liver biopsy specimen, or ≥ 2 noncontiguous organs
- Isolation of *M. tuberculosis* from 1 organ and histologic demonstration of caseating granulomatous inflammation from the bone marrow, liver biopsy specimen, or another noncontiguous organ;
- Isolation of *M. tuberculosis* from 1 organ and radiographic finding of miliary lung lesions

Clinical profile of all the patients was recorded. Assessment of all the results was done using SPSS software. Chi-square test was used for evaluation of result of significance.

Results

Mean age of the patients was 55.9 years. 66 percent of the patients were males while the remaining 34 percent were females. Fever, malaise, weight loss and poor appetite were seen in 66 percent, 30 percent, 24 percent and 20 percent of the patients respectively. Cough, dyspnea, myalgia and joint pain was seen in 20 percent, 12 percent, 14 percent and 18 percent of the patients respectively. On chest imaging, consolidation, fibrotic change, miliary lesion and nodular change was seen in 16 percent, 10 percent, 50 percent and 8 percent of the patients respectively.

Table 1
Demographic data

Variable	Number
Mean age (years)	55.9
Males (%)	66
Females (%)	34

Table 2
Clinical profile

Clinical profile	Number	Percentage
Fever	33	66
Malaise	15	30
Weight loss	12	24
Poor appetite	10	20
Night sweats	8	16
Cough	10	20
Dyspnea	6	12
Myalgia	7	14
Joint pain	9	18
Headache	8	16
Abdominal pain	10	20
Abdominal distension	12	24

Table 3
Pattern on chest imaging

Pattern on chest imaging	Number	Percentage
Consolidation	8	16
Fibrotic change	5	10
Miliary lesion	25	50
Nodule	4	8
No lesion	8	16

Discussion

Consistent with previous reports, patients with disseminated TB usually had several abnormal laboratory findings, showing hypoalbuminemia, elevated ALP and GGT, hyponatremia, and anemia. The laboratory data reflect malnutrition, infiltrative liver disease, inappropriate secretion of antidiuretic hormone, and chronic illness, respectively. Previous study of disseminated TB also showed that 80% of patients had pathologic evidence of hepatic involvement, and presented with elevated ALP and GGT with only slight increases of hepatic transaminases and bilirubin, suggesting infiltrative liver disease such as TB, rather than chronic active hepatitis, cirrhosis, or hepatic congestion.⁶⁻⁸

Mean age of the patients was 55.9 years. 66 percent of the patients were males while the remaining 34 percent were females. Fever, malaise, weight loss and poor appetite were seen in 66 percent, 30 percent, 24 percent and 20 percent of the patients respectively. Wang JY et al described the clinical characteristics and outcome of disseminated tuberculosis. Of the 3058 patients with culture-confirmed tuberculosis, 164 (5.4%) had disseminated disease; 14.0% of patients had acquired immunodeficiency syndrome. The most common radiographic finding was miliary lung lesions (47.0%); 31.1% of patients died at the end of the study. Poor prognostic factors included hypoalbuminemia, hyperbilirubinemia, renal insufficiency, and delayed antituberculosis treatment. Clinical findings suggestive of disseminated tuberculosis were miliary lung lesions, serum ferritin >1000 microg/L, infiltrative liver disease, and adjusted calcium >2.6 mmol/L. Simultaneously performing mycobacterial culture and histopathologic examination of bone marrow biopsy was more sensitive and faster than just performing mycobacterial blood culture in diagnosing disseminated tuberculosis. Of the 64 preserved *Mycobacterium tuberculosis* isolates, 47 (73.4%) were clustered and 27 (42.2%) were Beijing family.¹⁰

Cough, dyspnea, myalgia and joint pain was seen in 20 percent, 12 percent, 14 percent and 18 percent of the patients respectively. On chest imaging, consolidation, fibrotic change, miliary lesion and nodular change was seen in 16 percent, 10 percent, 50 percent and 8 percent of the patients respectively. Wang JY et al conducted a retrospective study to evaluate the incidence of tuberculosis-induced DIC. All culture-proven tuberculosis patients who developed DIC before starting anti-tuberculosis treatments were selected for this study. Patients who had other clinical conditions or were infected by other pathogens that may have been responsible for their DIC were excluded. Survival analysis was performed for each variable with possible prognostic significance. Their results showed that 27 (3.2%) out of the 833 patients with culture-proven tuberculosis had tuberculosis-induced DIC with a mortality rate of 63.0%. The most common clinical manifestations were fever (63.0%) and multiple patches of pulmonary consolidation (59.3%). Seven (25.9%) patients had disseminated tuberculosis. Twelve (44.4%) developed acute respiratory distress syndrome and three (11.1%) were associated with hemophagocytosis. Twenty-four (88.9%) patients had findings that were unusual for an acute bacterial infection, such as positive acid-fast smear, miliary pulmonary lesions, lymphocytotic exudative pleural effusion, and mediastinal lymphadenopathy.¹¹ Crump JA et al described the clinical presentation, predisposing conditions, diagnostic approach, and outcome for 52

patients with disseminated tuberculosis. The mean age of the patients was 52 years (range, 2-93 years). Fever and weight loss were common at presentation, and delays in the initiation of therapy often occurred. Predisposing conditions included human immunodeficiency virus infection (46% of patients), immunosuppressive therapy (21%), alcoholism (12%), diabetes mellitus (12%), and hematologic disorders (8%); 17% of patients had no disorder of immunity detected. Examination of biopsy specimens from sites of localized disease, especially lymph nodes, had a high diagnostic yield. In this study, mycobacterial blood culture appeared to be as sensitive as bone marrow culture in diagnosing disseminated tuberculosis (sensitivity, 58% vs. 54%).¹²

Conclusion

Majority of the patients demonstrate clinical findings suggestive of disseminated TB. Combined mycobacterial culture and histopathologic examination of biopsy from bone marrow were more sensitive and faster than mycobacterial blood culture in diagnosing disseminated TB.

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