

Original Article

The Spectrum of Tuberculosis in King Abdul Aziz University Hospital, Jeddah, Saudi Arabia

Faiza A Qari

Department of Medicine, King Abdul Aziz University Hospital, Jeddah, Saudi Arabia

Kuwait Medical Journal 2002, 34 (2): 139-143

ABSTRACT

Objective: A review of 157 patients with active tuberculosis seen at King Abdul Aziz University hospital during the two-year period (July 1999-July 2001).

Method: Retrospective study reviewing medical records of patients with final diagnosis of tuberculosis on discharge. The data included demographic data, spectrum of clinical presentations, diagnostic methods including smear, culture and histology and the outcome of treatment.

Results: A total of 157 patients were admitted with tuberculosis. Median age was 33 (± 15.33) years. A total of 57 (36%) were Saudis and 100 (64%) were non-Saudis. In patients with pulmonary tuberculosis and pleural effusion, the diagnosis was confirmed by either positive sputum smear for AFB or on pleural biopsy, except in five patients where the diagnosis was based on clinical grounds only and pleural fluid analysis. There was a

wide spectrum of extra pulmonary tuberculosis diagnosed histologically except for five patients where treatment was started empirically based on high clinical suspicious and strongly positive tuberculin test.

Conclusions: The use of different modalities of investigations like positive sputum smear, culture, computerized tomographic scanning, histological diagnosis of tissues obtained through fibro optic endoscopy, laparoscopy, liver biopsy and strotactic brain biopsy simplified the diagnosis and hence the management of extra pulmonary tuberculosis. It is reasonable to start anti-tuberculous medications on strong clinical grounds in conjunction with close outpatient supervision in cases where tissue biopsy is difficult to be obtained, such as mediastinal lymphadenopathy and tuberculoma.

KEY WORDS: diagnosis, extra-pulmonary tuberculosis, treatment, tuberculosis

INTRODUCTION

Tuberculosis (TB) remains a major worldwide public health problem. Failure to eliminate TB, which is technically a curable and preventable disease, results from many factors: the nature of tubercle bacillus which remains dormant for extended periods at a time, poor patient compliance with long-term treatment duration, the continued immigration of infected peoples from endemic countries, misdiagnosis by physicians, or patients' inability to afford treatment cost^[1,2].

The pattern of disease may be modified by socioeconomic, genetic, dietary, and other poorly understood factors. During the last two years, a total of 157 patients with TB were admitted to King Abdul Aziz University Hospital in Jeddah. This study reviews the spectrum of clinical presentations, different diagnosis tools available, way of diagnosis and treatment outcome.

MATERIALS AND METHODS

King Abdul Aziz University Hospital is a teaching government hospital in Jeddah, in the western province of Saudi Arabia. A total of 157 patients were admitted either to the medical or surgical wards with a final diagnosis of tuberculosis during a two-year period between July 1999- July 2001.

Medical records were reviewed to document the following; demographic data including age, sex, nationality, pulmonary or extra-pulmonary TB, variety of clinical presentations, diagnostic methods used to reach the diagnosis like ESR, PPD, AFB in smear and culture. Radiology, fluid aspirations and histopathology were noted. Treatment of TB either for six months or longer duration and treatment outcome were included.

Statistical analysis was carried out using SPSS 7.5 (Statistical Package for Social Science). Results were presented as mean \pm SD or as a percentage.

Address correspondence to:

Dr Faiza. A. Qari, FRCP, ABIM, Medical Department, King Abdul Aziz University Hospital, P.O Box: 13042, Jeddah -21943, Saudi Arabia.
Fax (966) 0 6743781, e-mail karifaiza@hotmail.com

RESULTS

During the two-year period between July 1999-July 2001, 157 patients were admitted with a final diagnosis of tuberculosis (Table 1). Median age at presentation was 33 (15-33) years. There were 92 females and 66 males with F:M ratio of 1.4:1. A total of 57 (36%) were Saudis and 100 (64%) were non-Saudis. Table 2 illustrates the distribution of patients according to nationality.

Hospital stay: Mean hospital stay was 21.8 (range = 1-180) days.

Table 1:
Types of tuberculosis

Types of Tuberculosis	No. of patients	%
Pulmonary	37	23.6
Cervical Lymphadenopathy	25	15.9
Pleurale effusion	22	14
Gastro-intestinal	22	14
Spinal cord	12	7.6
Disseminated	10	6.4
Meningitis	10	6.3
Submandibular Lymphadenopathy	7	4.5
Mediastinal Lymphadenopathy	2	1.3
Pericarditis	2	1.3
Skin	2	1.3
Breast	2	1.3
Intracranial Tuberculoma	3	1.9
Peripheral arthritis	1	0.6
Total	157	100

Table 2:
Distribution of patients according to nationality

Nationality and Ethnic Origin	No. of patients	%
Saudis	57	36
African (Somali, Chadian, Ethiopian, and Nigerian)	20, 11, 12, 1	28
Arabs (Yemeni, Palestinian, Sudanese, and Syrian)	19, 4, 2, 1	16.7
Far East (Indonesian and Philipinos)	6, 7	8.4
Asian (Bangladeshi, Pakistani and Burmese)	10, 4, 2	10.3
American	1	0.7
Total	157	100

Intracranial Tuberculoma:

Three patients had multiple intracranial tuberculomas, two presented with grand mal epileptic seizures and one with confusion and diplopia. A common presentation amongst the patients was headache. All three patients had computerized topographic (CT scan brain) which showed multiple ring enhancing lesions and large amount of brain edema. The diagnosis of tuberculoma was confirmed by brain biopsy in two patients through stereotactic surgery, and the

third patient was diagnosed on clinical grounds, CT scan finding and CSF analysis with predominant lymphocytes. Clinical improvement on anti-tuberculous drugs and steroids was seen in all patients.

Spinal Cord Tuberculosis:

A total of 12 (7.6%) of patients had spinal cord tuberculosis with median age of 14 years (± 25.3 years). Six patients presented with paraplegia, and four with psoas abscess. All complained of backache. Five cases had associated pleural effusion. The diagnosis was established on MRI, which showed psoas abscess. The diagnosis was confirmed by positive AFB isolated from psoas abscess aspiration in two patients, and by histological examination of material obtained at surgery in eight patients. However, the diagnosis was made on clinical grounds and histological examination of pleural biopsy in two patients. Clinical recovery on anti-tuberculous drugs was accomplished in six patients only. Another four patients needed vertebral fixation together with anti-tuberculous drugs. Median hospital stay was 23 (± 9.5) days.

TB meningitis:

A total of ten patients had TB meningitis with a median age of 27 (± 18.4) years. All ten patients had fever and headache. Three patients presented with coma, two with confusion, and one with diplopia. The diagnosis was made on clinical grounds in association with lymphocytosis, elevated protein and low-normal sugar in the CSF. All of these patients recovered on anti-tuberculous treatment together with steroids. One patient had complications of multiple cranial nerves palsy and hydrocephalus. Median hospital stay was 37.22 (± 29.7) days.

Gastro-intestinal Tuberculosis:

A total of 22 patients had gastro-intestinal TB. All presented with ascites due to TB peritonitis. The diagnosis was based on lymphocytosis and elevated protein in ascitic fluid, positive AFB in two patients. Histological diagnosis from peritoneal biopsy obtained by laparoscopy was made in 10 patients. Six patients presented with abdominal pain, fever, diarrhea, vomiting and weight loss. Small bowel lumen was involved in two patients and colon was involved in another four patients. Histological diagnosis was obtained in all of them by fiber optic endoscopy. Four patients presented with severe abdominal pain, fever, weight loss due to abdominal lymphadenopathy. Diagnosis was confirmed by lymph node biopsy obtained during laparotomy and positive culture of TB in one patient.

All patients recovered on anti-tuberculous drugs except one who died of septicemia due to complicated TB peritonitis.

Cervical Lymphadenopathy:

Of the 25 patients with cervical lymphadenopathy, only ten patients had fever or weight loss. Cold abscesses were found in three patients. Diagnosis was established in all patients by caseating granulomas on lymph node biopsy, and positive acid-fast bacilli in pus from three patients with cold abscesses. Three patients had strong family history of tuberculosis. All patients recovered on anti-tuberculous treatment. One patient was complicated with scar and sinus at the site of TB.

Supraclavicular and submandibular Lymphadenopathy:

A Total of seven patients had either supraclavicular or submandibular Lymphadenopathy. Diagnosis was established on clinical grounds in association with strongly positive TB skin tests and caseating granuloma in lymph node biopsy. All patients responded to anti-tuberculous treatment.

Medastinal Lymphadenopathy :

Two patients presented with the symptoms of fever and weight loss had medastinal lymphadenopathy on CT scan. One had caseating granulomas in tissue obtained by mediastinoscopy. The other one was diagnosed clinically on positive skin test and strong family history of tuberculosis. Both responded to anti-tuberculous drugs.

Disseminated Tuberculosis:

All the ten patients with disseminated TB had fever and miliary mottling on chest radiograph. Diagnosis was established in three of them by positive sputum smear for acid-fast bacilli that was obtained by bronchoscope. Liver biopsy was taken from two patients and lymph node biopsy from one. All showed caseating granulomas with Langerhan's giant cells. Two patients had AIDS as an underlying disease with multi-organ involvement and the diagnosis in them was made on clinical grounds only. All patients recovered on anti-tuberculous drugs, except one who died a few days after admission.

Peripheral arthritis:

One patient presented with left knee effusion. Synovial biopsy showed granulomas. He responded to anti-tuberculous treatment.

TB pericarditis:

Two patients had symptoms and signs of heart failure. One patient had constrictive pericarditis and granuloma of the pericardium was found

during surgery. The second patient presented with pericardial effusion where diagnosis was made on the basis of pericardial fluid analysis, positive tuberculous skin test and complete recovery on empirical anti-tuberculosis drugs.

TB skin:

There were two patients with TB skin. One case of lupus vulgaris diagnosed clinically and confirmed by skin biopsy and the other had multiple skin abscesses all over the body. AFB was isolated from the abscesses. He showed recovery on anti-tuberculosis drugs.

TB breast:

Two patients presented with TB breast. One had a mass which showed granulomas on the biopsy, and the other had abscess from which AFB was isolated. They respond dramatically to anti-tuberculosis drugs.

Pulmonary Tuberculosis:

A total of 37 patients had pulmonary tuberculosis presented with fever, weight loss and cough. Only three patients had hemoptysis. All patients had different chest radiographic abnormalities namely apical fibrocaceous, lung cavities, lung abscess and bronchopneumonia with a positive sputum smear for AFB.

All patients recovered on anti-tuberculous medications, except one patient who died from respiratory failure because of severe tuberculous lung disease associated with chronic obstructive lung disease.

TB pleural effusion:

A total of 22 patients with pleural effusions presented with fever and cough. Diagnosis was made on pleural fluid analysis, which showed moderate increase in white cell count with predominant lymphocytosis and elevation of protein. Caseating granulomas on pleural biopsies confirmed the diagnosis in 20 patients. In five patients, the diagnosis was based only on clinical suspicious, positive tuberculous skin test and pleural fluid analysis as pleural biopsy was technically difficult to perform in the presence of encysted pleural effusion. All patients showed remarkable recovery on anti-tuberculosis drugs. Three patients, however, required a combination of the anti-tuberculosis drugs and steroids.

DISCUSSION

King Abdul Aziz University Hospital (KAUH) is a 340-bed governmental teaching hospital that provides health care to a multinational population of mixed socioeconomic status. All patients with a final diagnosis of tuberculosis on the discharge

computer code were included in the study. TB was more common in females than males with a female to male ratio of 1.4:1. More than 60% of patients with tuberculosis were non-Saudis with low socioeconomic status. This could be explained by the fact that Jeddah is a highly commercial center where most of the expatriates come for work. This is in contrast to reports from Asir and central region of Saudi Arabia where most of patients were Saudis^[3,4]. However it is similar to other Gulf States like Kuwait, Bahrain, where tuberculosis was more common among expatriates^[5,6].

Only 37 (23.6%) patients had pulmonary tuberculosis in our study. This low percentage could be attributed to the hospital policy of not admitting patients with active pulmonary tuberculosis with classical history of hemoptysis or multiple cavities on chest radiograph. These cases are referred to TB Center in Jeddah on arrival^[7].

The diagnosis of extra-pulmonary tuberculosis was delayed due to the absence of the common presenting symptoms of fever, weight loss, high ESR and abnormal chest x-ray. Of the total number of patients, 50 had either negative tuberculin skin test or tuberculin tests were not done at all. Positive tuberculin test, though, is unhelpful in Saudi Arabia where the disease is endemic^[8,9,10]. There was a wide spectrum range of extra pulmonary tuberculosis in our series where the diagnosis was confirmed histologically in the majority of cases.

TB meningitis:

TB meningitis was diagnosed mainly on clinical suspicious in association with lymphocytosis, elevated protein and or low sugar in the CSF. CSF smear for AFB was negative in all our patients. PCR was not done, as it is not available in our institute. One patient developed multiple cranial nerve palsies and hydrocephalus due to delay in diagnosis and referral. Early ventricular shunting may save the patient's life in cases of hydrocephalus due to tuberculous meningitis if cerebral edema cannot rapidly be reversed by anti-tuberculous treatment in junction with steroids^[11,12].

Spinal tuberculosis:

Pott's disease is a common cause of morbidity. It results in paraplegia, caudal equine symptoms and signs and psoas abscess even in the absence of bone or disc involvement. Long hospital stay was noticed in our study for physiotherapy and rehabilitation^[13].

Gastro-intestinal Tuberculosis:

Peritoneal tuberculosis was the most common type of gastrointestinal involvement with main

presentation of ascites. Diagnosis was based on peritoneal biopsy through laparoscopic examination and positive AFB in ascites fluid analysis. The main presentations of the disease involving the bowel were fever, abdominal pain and diarrhea. The colon was most frequently involved and the diagnosis of GIT involvement was made on tissue biopsy by gastroduodenoscopy and colonoscopy^[14].

Intra-abdominal lymphadenopathy presented mainly with abdominal pain. Lymph nodes seen on CT scan were biopsied on laparotomy, which confirmed the diagnosis.

Disseminated Tuberculosis:

Disseminated tuberculosis follows reactivation of a healed primary focus with homogenous spread. The presentation was fever of unknown origin in all patients. It must be considered in patients with suppressed immunity. Two patients had AIDS^[15,16], one had SLE, and one had end stage renal disease.

Miliary mottling on the chest radiograph strongly suggests the diagnosis but is often absent for the first six weeks of the illness, as observed in some of our patients, which leads to the delay in the diagnosis. Smears taken from the sputum, CSF, bone marrow, materials obtained from skin abscess, lymph nodes, pleural and peritoneal fluid for acid-fast bacilli may sometimes give positive results. An important diagnostic clue is finding hepatic granulomas in a biopsy as has been seen in three of our patients. Tuberculosis is the most common cause of granulomatous hepatitis in this region.

Disseminated tuberculosis has a 20-30% mortality rate even with adequate treatment. The cause of death could be due to respiratory failure, superadded pneumonia, pulmonary emboli, and pulmonary edema or adrenal failure.

Multiple organ involvement is one of the manifestations of disseminated tuberculosis. This occurred in four of our patients where the pericardium, bone, eye, chest, liver, spleen, meningis and lung were involved^[17].

Response to treatment is slow. Fever usually takes two to eight weeks to resolve. Radiographic changes generally clear within one month, although they may persist for three months or more^[18]. This was shown in our study.

Tuberculous Lymphadenopathy:

Tuberculous Lymphadenopathy is a common yet less severe form compared to other type of tuberculosis. Single or multiple lymph nodes have been found in almost every site but the most common site is cervical lymph nodes. The

important differential diagnosis is lymphoma, so for this reason a biopsy is crucial. Isolated tuberculoma mediastinal lymphadenopathy in an adult has been reported in two cases^[19]. The differential diagnosis was lymphoma or malignant metastases. A trial of anti-tuberculous medications is an acceptable alternative to mediastinoscopy or thoracotomy when there is strong clinical suspicion of tuberculosis and close outpatient supervision.

Intra cranial Tuberculoma :

Tuberculoma is one of the common causes of intracranial tumors in Saudi Arabia and in countries where tuberculosis is prevalent. Fever and weight loss are often absent and most patients have normal chest radiographs. Tuberculoma must be considered in the differential diagnosis of headache, confusion, rapid deterioration of vision and epilepsy. CT scanning which showed multiple mass lesions and extensive cerebral edema with ring enhancement made the diagnosis initially. The definitive diagnosis was established by brain biopsy through stereotactic surgery in two patients. However, strong clinical grounds in association with CT scan findings are reasonable approaches to start anti-tuberculous drugs as an alternative to stereotactic brain biopsy or craniotomy where the facility is not available or due to financial reason^[20].

CONCLUSION

Tuberculosis is a common disease in Saudi Arabia and has a wide spectrum of presentations. It should be considered in the differential diagnosis of every patient seen. Late diagnosis of this curable disease could result in tragedy and treatment should be started after confirming the diagnosis either by modern technique to isolate acid fast bacilli by positive smear, culture or PCR from different fluid aspiration or tissue diagnosis by fiber optic endoscopies, laparoscopy, ultrasound, liver biopsy, laparotomy for lymph node biopsy and bone marrow biopsy. CT scanning and brain biopsy, using stereotactic surgery for tuberculomas, are also useful. However, in cases where tissue biopsy is difficult to obtain like, mediastinal lymphadenopathy or brain tuberculoma, it is reasonable to start anti-tuberculous medications if there is a strong clinical suspicion in association with close outpatient supervision.

REFERENCES

1. Ravignion MC, Sinder DE, Kochi A. Global epidemiology of tuberculosis. Morbidity and Mortality of a worldwide epidemic. *JAMA* 1995; 273:220-226.
2. Al-Hajjaj MS, Pandya L, Marie AA, Madani A, AL-Sherif N, AL Majed S. Pulmonary tuberculosis in Saudi Arabia: A retrospective study of 1566 patients. *Ann Saudi Med* 1991; 11:443-447.
3. Al-Wabel A, Teklu B, Ghaida S, Aziz M, Qamruddin M. The spectrum of pulmonary Tuberculosis in the Asir Region of Saudi Arabia. *SMJ* 1995; 16:105-107.
4. Zaman R. Tuberculosis in Saudi Arabia: Epidemiology and incidence of Mycobacterium tuberculosis and other mycobacterium species. *Tubercle* 1991; 72:43-49.
5. Malik SK, Khalfan S. The epidemiology of tuberculosis in Bahrain. *Tubercle* 1990; 71:51-54.
6. Bahr GM, Standford JL, Chugh TD, Shaaban MA, Gabriel M, AL-Shimali B, et al. An investigation of patients with pulmonary tuberculosis in Kuwait in preparation for studies of immunotherapy with Mycobacterium vaccae *Tubercle* 1990; 71:77-86.
7. Al-Dababagh AA, EL-Deeb HAF, AL-Baghdadi TM. The radiographic features of pulmonary tuberculosis observed for the western Region of Saudi Arabia. *Ann Saudi Med* 1991; 11:194-200.
8. Al-Kassimi F, Abdullah A, AL-Orainey I, AL-Hajjaj M, Abdul Baghee A, Baner A. Mantoux reaction survey conducted in the northern region of Saudi Arabia. *Ann of Saudi Med* 1991; 3:315-321.
9. Farer LS. Prior BCG vaccination and PPD skin test. *JAMA* 1983; 250:3106-3109.
10. Huebner RE, Schein MF, Bass JB. The tuberculin skin test. *Clin Infect Dis* 1993; 17:968-975.
11. Kennedy H, Fallon RJ : Tuberculous meningitis *JAMA* 1979; 241:264-267.
12. Murray HW, Brandstetter RD, Lavyne MH. Ventriculoarterial shunting for hydrocephalus complicating tuberculous meningitis *AM J Md* 1981; 70:895-901.
13. Pertuise E, Beaudeau J, Liot F, Hrusitzky A, Kemiche F et al. Spinal tuberculosis in adults. A study of 103 cases in developed country 1980-1994. *Med* 1999; 78:309-320.
14. Novis BH, Banks S, Marks IN. Gastro- intestinal and peritoneal tuberculosis. A study of cases at Grotte Schuur Hospital 1962 -71. *Afr Med J* 1973; 47:365-370.
15. Markwiz N, Hansen NI, Hopewell PC, Glassroth J, Kvale PA, Mangura BT, Wilcosky TC et al. Incidence of tuberculosis in the United state among HIV infected persons. The pulmonary complications of HIV Infection study group. *Ann Inter Med* 1997; 15:123-132.
16. Davidson PT, Sinder DE, Barnes PE, Bloch AB. Tuberculosis in patients with human immunodeficiency virus infection. *N Engl Med* 1991; 342:1644-1650.
17. Sydow M, Schauer A, Crozier TA, Burchardi H. Multiple organ failure in generalized disseminated tuberculosis. *Resir Med* 1992; 86:517-519.
18. Combs DL, O'Brien RJ, Geiter LJ. United States Public Health service. Therapy Trial 21: effectiveness, toxicity and acceptability. *Ann Intern Med* 1990; 112:397-406.
19. Hand S, Fisher M, Fewell JW. Intrathoracic tuberculosis lymphadenopathy in adults. *JAMA* 1979; 241:505-512.
20. Ramamurthi B, Vardarajan MG. Diagnosis of tuberculomas of brain. *J Neurosurg* 1981; 18:12-18.