

# Spinal tuberculosis: A five-year review of cases at the National Tuberculosis Centre

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## Summary

We reviewed 31 cases (19 males and 12 females) of spinal tuberculosis seen at the National Tuberculosis Centre from 1985 to 1989. The mean age was 35.4 years. The predominant clinical feature was backache (90.3%), while neurological features were found in 30.9%. An elevated erythrocyte sedimentation rate (in 80.0%) and a positive Mantoux test (in 70.9%) served as useful investigations. Spinal x-ray was abnormal in all cases, the lumbar spine being most commonly involved. Bacteriological or histopathological confirmation was obtained in only 29.0% of cases. The mainstay of treatment was anti-tuberculous chemotherapy with surgery being performed in 41.9% of patients.

*Key Words:* Spinal tuberculosis, Malaysia, Clinical features, Investigations, Management.

## Introduction

Spinal tuberculosis has existed for at least 5000 years.<sup>1</sup> It is the most common cause of vertebral infection<sup>2</sup>. It is the most common and dangerous form of bone tuberculosis<sup>3</sup>. While the mortality rate has decreased from 10 per cent to 3 per cent, the rate of paraparesis remains constant at 20 per cent<sup>1</sup>. This paper reviews 31 cases of spinal tuberculosis seen at the National Tuberculosis Centre. The study was done to determine the clinical features, investigations and management in a local setting. We also reviewed the literature on the topic.

## Materials and Methods

We retrospectively reviewed the case records of patients diagnosed as having spinal tuberculosis during a 5 year period from January 1985 to December 1989. All of them had completed their anti-tuberculous chemotherapy by September 1990.

## Results

The mean age of our patients was 35.4 years (range 2 years to 67 years). The majority of patients were between 21 to 50 years old. Nineteen of our patients were males while 12 were females. Twenty-one of our patients were Malays, 4 were Chinese, 5 were Indians and one was an Aborigine.

Twelve of our patients had at least one BCG scar, 18 had none while in one, no data was available. Table I shows the major clinical features at presentation. Backache, seen in 28 patients (90.3%), was the commonest complaint. Neurological features were found in 12 patients (30.9%). Systemic symptoms and symptoms related to the respiratory system were uncommon. All our patients had symptoms for at least one month, with four having symptoms for more than a year (mean duration 7.4 months).

**Table I**  
**Clinical features at presentation in spinal tuberculosis**

Clinical Feature	Number of Patients
Backache	28
Sensory	10
Motor	12
Bladder or bowel dysfunction	3
Deformity	3
Fever	5
Weight loss and Anorexia	4
Malaise	3
Cough	8
Haemoptysis	1

Twenty-two patients (70.9%) had a normal chest x-ray. Sputum direct smear for acid-fast bacilli was positive in only one patient while culture was positive in only two patients. The mean erythrocyte sedimentation rate (ESR) was 35.0 mm/hour (range 10 to 95 mm/hour). In 80% of patients the ESR was  $\geq 20$  mm/hour while in 60% it was  $\geq 50$  mm/hour. The mantoux test was  $\geq 10$  mm in 19 of the 24 patients in whom data was available (70.9%). Thirteen of these had a reading of  $\geq 15$  mm (54.2%).

Table II shows the region of involvement in our patients with spinal tuberculosis. The most common area affected was the lumbar spine (54.8%). In 25 patients, the total vertebral loss was one. It was less than one in 3 patients while in 2 other patients it was two and three respectively. In another patient data was not available. Paravertebral abscesses were noted in 7 patients. In 5 of the 7 patients in whom a myelogram was performed spinal cord compression was seen. Only 7 patients had histopathological confirmation of spinal tuberculosis. Tissue direct smear was positive in one patient while tissue culture was positive in another.

Combination chemotherapy using streptomycin, isoniazid, rifampicin and pyrazinamide was used in 24 patients (77.4%). Five patients were treated with a combination of ethambutol, isoniazid, rifampicin and pyrazinamide while two others were given a combination of rifampicin, isoniazid and pyrazinamide. Duration of treatment ranged from 6 to 14 months (mean 10.3 months). The majority of patients (43.9%) had surgical intervention including 4 of the patients with spinal cord compression (one of them refused surgery). The details of the surgical procedures performed were not available.

Clinical improvement occurred in 23 patients (74.2%). Symptoms were unchanged in 3 patients while 4 patients complained of worsening symptoms. One patient died while on treatment. None of our patients had radiological deterioration of disease once chemotherapy was commenced.

**Table II**  
**Region of spinal involvement in patients with spinal tuberculosis (n = 31)**

Region of spine	Number
C <sub>3,5</sub>	1
C <sub>7</sub> , T <sub>1</sub>	1
T <sub>1</sub>	1
T <sub>2,3</sub>	1
T <sub>8,9</sub>	1
T <sub>9,10</sub>	1
T <sub>10,11</sub>	1
T <sub>11,12</sub>	3
T <sub>12</sub>	3
T <sub>12</sub> , L <sub>1</sub>	1
L <sub>1</sub>	2
L <sub>1,2</sub>	4
L <sub>2,3</sub>	1
L <sub>3,4</sub>	2
L <sub>4</sub>	1
L <sub>4,5</sub>	5
L <sub>5</sub>	1
L <sub>5</sub> , S <sub>1</sub>	1

### Discussion

The findings in our study support the fact that spinal tuberculosis is more commonly a disease of adults<sup>1,2</sup>. However studies in India have revealed that about a third of cases occurred in children and young adults below 20 years of age<sup>4</sup>. The sex incidence is almost equal. In our study there was a slight preponderance in males. This was similar to the findings of Lifeso et al<sup>1</sup> and Azzam et al<sup>2</sup>. The findings in Shanmugasundaram's personal series and the City Hospitals Study, Madras however showed a slight preponderance in females<sup>4</sup>. The diagnosis is more difficult in adults as compared to children as a greater number of differential diagnoses have to be considered<sup>1</sup>. These include secondaries, multiple myeloma and osteomyelitis. A long duration of clinical features was noted in our study. As in other studies<sup>5,6</sup>, backache was the most common clinical feature. However neurological impairment was relatively common in our series. This may be due to the fact that our patients presented late and our ready access to facilities for surgical intervention.

In most of our cases the chest x-ray was normal. A chest x-ray is normal in between 70-80% of cases<sup>2,6</sup>. It is therefore of limited value in the diagnosis of spinal tuberculosis. While the value of an erythrocyte

sedimentation rate (ESR) and Mantoux test have been questioned<sup>1</sup>, they served as useful procedures in our study. The vast majority of our patients had a markedly elevated ESR and a strongly positive Mantoux reading. Furthermore, the ESR can also be used to evaluate response to treatment<sup>2,6</sup>.

As in other studies<sup>2,4</sup>, the lumbar and lower thoracic spine were the most commonly affected (Table II). All our patients had an abnormal spinal x-ray. The classical radiological feature of spinal tuberculosis is disease of two adjacent vertebral bodies with destruction of the intervening intervertebral disc. Although rare, atypical forms such as involvement of a single vertebral body, of neural arch only or without bone involvement (intra- or extra-dural tuberculomas or tuberculous arachnoiditis) have to be borne in mind<sup>1,7</sup>. While plain x-ray and myelogram remain the standard radiological investigations, computerized axial tomogram and magnetic resonance imaging are becoming increasingly popular. With their superior resolution, they are able to detect disease earlier<sup>2,7</sup>.

Although it would be ideal to obtain either bacteriological or histopathological confirmation by fine needle aspiration or open biopsy, this was not attained in the majority of our patients. The diagnosis in most cases was based on clinical features and other more basic and less invasive procedures. It is worth noting that due to the low bacterial population of an infected spine, the organism was found in only 40% of aspirates in reported studies of the Medical Research Council<sup>8</sup>.

Anti-tuberculous chemotherapy is the mainstay of treatment for spinal tuberculosis<sup>1,3,8</sup>. Fancourt et al reported that no patient developed spinal cord compression once treatment was commenced although bone changes could deteriorate for up to 4 months<sup>6</sup>. Generally the duration of treatment is greater than that for pulmonary disease. In our study the mean duration was 10.3 months while the current recommendation of the Joint Tuberculosis Committee of the British Thoracic Society is for nine months' treatment<sup>9</sup>. However, one study<sup>10</sup> has suggested that with the presently available anti-tuberculous drugs, a six-month regimen may be equally effective.

While the mainstay of treatment is chemotherapy, surgery serves as an important adjunct in some cases. Neurological impairment is a common indication for surgical intervention<sup>1,3,5</sup>. Early decompression in Pott's paraplegia has been found to produce speedy recovery from paraplegia and ensured rapid healing of the lesion<sup>11</sup>. Spinal tuberculosis with a long duration of paraplegia may still improve after decompression<sup>2</sup>. Other indications for surgery include severe back pain, marked kyphosis, spinal instability and large abscesses<sup>1,5</sup>. The management of non-paraplegic spinal tuberculosis varies in different settings. Where appropriate facilities are available (surgical expertise, anaesthetic and nursing facilities) a combination of chemotherapy and the Hong Kong radical operation produces earlier healing and less kyphosis<sup>3,8</sup>. Otherwise, reliance should be placed on anti-tuberculous chemotherapy alone.

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