

## ORIGINAL ARTICLE

# A Retrospective Analysis of Management of Tuberculosis of Spine in a Tertiary Care Hospital

Prashant N Gedam<sup>1</sup>, Prathamesh Kane<sup>2</sup>

1. Additional Professor, Department of Orthopaedics, B.Y.L Nair Ch. Hospital & Topiwala National Medical College

2. SMO, Department of Orthopaedics, B.Y.L Nair Ch. Hospital & Topiwala National Medical College, Mumbai

## Abstract

**Introduction:** Tuberculosis of spine is commonest osteo-articular manifestation of tuberculosis. There are about 6 million patients with radiologically diagnosed tuberculosis in India. About 1-2% of these have involvement of spine. This study was conducted to know the outcome of patients of tuberculosis of spine and the radiological changes during the course of treatment of 50 patients. **Materials & Methods:** Patients who completed their treatment between July 2013 to August 2016 were selected for the study. Patients who were more than 18 years old and completed their Anti tuberculosis drug therapy, regular in follow-up were selected. Patients with resistance to 1st line anti tuberculosis drugs were rejected. **Result:** Thoracic region was the commonest site affected (28/50). 31 cases had normal neurology and 19 patients had some form of neurodeficit. None of the patient had worsening of neurodeficit. Out of the 19 patients 5 patients improved with rest and AKT; 14 patients underwent surgery. Pre-treatment patients had either severe or moderate pain which reduced on treatment. At presentation 24 patients had kyphus which reduced to 12 after treatment. Radiological changes such as vertebral body, destruction paradiscal involvement, paravertebral abscess and cord compression disappeared after treatment. **Conclusion:** Primary line of management for tuberculosis of spine is AKT with surgery to be done for specific indications. Prognosis after advent of neurodeficit is guarded as all the patients may not regain normal neurological status even after surgery.

**Keywords:** Tuberculosis of Spine, Infections of Spine, Tuberculosis

**Address for correspondence:** Room no 306, G building, 3rd floor, TNMC and BYL Nair Ch Hospital, Mumbai Central, Mumbai -08. Email [psk1111@gmail.com](mailto:psk1111@gmail.com) Phone no 9930204624

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## Introduction

Tuberculosis of spine is frequently encountered manifestation of extra pulmonary tuberculosis. Lack of standardised guidelines has made its treatment a challenge. Early diagnosis and prompt treatment is necessary to prevent vertebral destruction, ensuing neurological deficit and long term effects like kyphus deformity (1). Tuberculosis of spine also known as Pott's spine is one of the oldest diseases known to mankind with its evidence found in mummies from 3400 BC in Egypt (2). The world has nearly 30 million people affected with tuberculosis. India has nearly one fifth of the case load in the world. There are about 6 million patients with radiologically diagnosed tuberculosis in India. About 1-2% of these have

involvement of spine (3). Another sociological aspect of this disease is that it primarily affects young adults with significant morbidity in this group (4). The present study was conducted with the intention to know the outcome of patient with tuberculosis of spine and to study clinical and radiological changes during the course of study.

## Materials and Methods

50 patients more than 18 year old with tuberculosis of spine who completed their Anti Koch's treatment (AKT) with first line drugs were selected for the study. Seropositive patients and defaulters were discarded. Patients were followed up on 3 monthly basis. Clinical and radiological examination was done on each

visit. Patients were evaluated with MRI before starting of AKT and at the end of the treatment. Patients were evaluated by CT guided biopsy and samples were sent for microscopy, culture and Genexpert. Patients of tuberculous spine were treated according to 'Middle Path Regime' described by Tuli (6). Chemotherapy regime followed was 2 months of intensive phase containing Isoniazid, Rifampicin, Pyrazinamide and Ethambutol with continuation phase given for 16 months containing Isoniazid and Rifampicin. Dosages of these drugs used were Isoniazid 10mg/kg, Rifampicin 15 mg/kg, Pyrazinamide 35mg/Kg. Operative procedure when required was decompression and stabilization with appropriate implant.

All the patients presenting with neurodeficit were admitted and treated with strict bed rest, 4 drug AKT and were monitored. If there was no improvement or worsening of deficit while the patient was on AKT patient was considered for surgery. Patient without neurological affection were treated on OPD basis. They were treated with immobilisation of spine with Four post collar, Tailor's brace with axillary support, lumbar corset for treatment of cervical, thoracic and lumbar spine respectively.

This data was gathered from Registers maintained on the Department of orthopaedics. Those patients who were admitted, data from indoor papers submitted in Medical Records department was also considered. All the data collected for the study was anonymised and no personal detail of the patient was documented.

**Data was evaluated on the basis of following:**

1. Classification according to vertebral level involved
2. Whether patient had neurological deficit
3. Whether surgical procedure was done or no
4. Progression of symptoms such as pain and deformity
5. Progression of radiological parameters

Neurological function was assessed according to Frenkel's classification of neurological functions.

**It was graded as follows (7)**

**Grade A:** Complete paralysis

**Grade B:** Preserved sensory function, no motor function below the affected level

**Grade C:** Incomplete motor function below

affected level

**Grade D:** Fair to good motor function below affected level

**Grade E:** Normal function

Symptom of pain was assessed with visual analogue scale. In this patient were asked to point their symptom on a scale of 100 mm with 0 indicating no pain and 100 indicating unbearable pain. This is divided into (5); no pain 0-4 mm, mild pain 5-44 mm, moderate pain 45- 75 mm and severe pain 75 -100 mm.

Deformity considered here is kyphus deformity which is due to destruction of vertebral body. MRI changes noted were size of paravertebral abscess and neurological compression and change in these parameters on AKT. X ray findings noted were involved no of bodies or paradiscal stage and later signs of healing such as marginal sclerosis, fibrous and bony union.

## Results

**Regions of the vertebrae involved**

Thoracic region of the vertebral column was the commonest region involved with 28(56%) patients presenting with it. It was followed by lumbar 14(28%) and by cervical spine 8(16%)

**Evaluation of Neurological function**

On presentation 31 out of 50(62%) patients presented with normal neurological function. These patients maintained their neurological status. Out of 19(38%) patients who had some form of neurological derangement; 4(8%) patient had Grade A function, 4 (8%) patients had grade B function, 3(6%) patient had grade C function and 8(16%) patients had grade D patients. After treatment, all the patients showed improving trends on successive follow ups (Table-1). At the end of treatment 40 patients had normal neurological status and with 3 and 7 patients in grade C and Grade D respectively.

**Surgical management and neurological functional evaluation on follow up**

19 patients who had some kind of neurological dysfunction were admitted. 5 of these patients improved on rest and thus were not considered for surgical management. 14 patients who did not improve with conservative management were considered for surgery.

Out of the 5 patient who were treated conservatively 4 patients recovered completely

and 1 had some residual deficit. Out of 14 patients who were considered for surgery, 5 recovered completely and 6 had recovery with some residual deficit but good function while 3 patients had non functional motor power

**Evaluation of symptoms and clinical findings**

**Pain:** Pain was presenting complaint in all patients. On completion of treatment all patients had good pain relief (Table-2).

**Deformity**

24 of the 50 patients evaluated had kyphus deformity at presentation. After completion of treatment only 12 patients had mild non progressive kyphus deformity. None of the patient who had undergone surgery had any residual deformity.

**X ray**

On presentation 48% patient had destruction of vertebral body. 30 %patients had paradiscal involvement with frayed margins of vertebrae;

with normal vertebral height.22% patients had loss of mineral density

On completion of treatment all the patients showed signs of healing such as fibrous union 36%, bony union 22%, sclerotic margins of vertebral bodies 24%, while 18 % patients had essentially normal x rays.

**MRI findings**

At presentation 86% patients had paravertebral abscess while 90 patients marrow edema 18(36%) patients had cord oedema. 20(40%) patients showed significant compression of spinal cord. On completion of treatment none of the patient had any paravertebral abscess; none show any marrow edema and no signs of spinal cord compromise.

**Inflammatory markers**

Patients raised ESR and CRP at presentation normalized by completion of AKT.

**Table- 1: Follow-ups**

Frankels Grade	A	B	C	D	E	Total
Baseline	4	4	3	8	31	50
3 months	0	1	7	10	32	50
6 months	0	0	7	5	39	50
9 months	0	0	6	7	39	50
12 months	0	0	4	7	40	50
15 months	0	0	3	7	40	50
18 months	0	0	3	7	40	50

**Table- 2: Pain intensity**

Intensity of pain ( VAS)	Baseline	After 18 months
Severe	28(56%)	0
Moderate	22(22%)	2(4%)
Mild	0	32(64%)
No	0	16(32%)
Total	50	50

**Discussion**

Spinal tuberculosis is the commonest form of skeletal tuberculosis and constitutes about 50% of all cases of osteo-articular tuberculosis (6-10). In developing countries it is major public health problem (11-13).

We found distribution of tuberculous spine as maximum involvement of thoracic spine (56 %) followed by lumbar spine (28%) and cervical spine (16%). In a study by SM Tuli et al. percentage of cervical, thoracic and lumbar

spine was 14%, 43.7% and 39.3% respectively (6). In a study conducted by Sadik I proportion of thoracic spine involvement was 60% (14). The predilection for spinal disease may be explained by the fact that the vertebrae are extremely well vascularized, even in adulthood (15).

Neurological complication in the form of deficit is present in 19/50 patients in this study 5/19 (24%) showed recovery on conservative management while rest 14/19 (76%) had to be operated for decompression and stabilization.

This is in concordance with the study by Tuli where 38% of his patients recovered with conservative management and 62% of the patient had to undergo surgery (16). None of the patient without neurological deficit deteriorated during the study. Thus effectiveness of AKT as a mode of treatment is reinforced as in study conducted by S. Rajasekaran et al. (17).

All patients who had undergone surgery showed improvement in neurological deterioration. 11(78% ) achieving good functional status (Frankels grade D and E). This is concordant with the study conducted by Patankar where (89%) patient with significant deficit improved after surgery (18).

In present study 100% of the patients had back pain as the presenting complaint of severe and moderate grade. All these patients achieved significant relief with 96 % patient with no or slight pain and 4% patient with moderate pain. Similar result was obtained by Sadik I Shaikh (2013) where 93 % patients had pain as a presenting complaint which was the commonest. Relief of back pain was achieved with all these (14).

In present study 24/50 (48%) patients had kyphus as presentation .Non progressive residual kyphus remaining in 12(24%) of these patients. Patients undergoing surgery achieved complete correction .Adults have mature skeleton, thus increasing kyphus with growth was not present (19). Progression of kyphosis is minimal after stable fixation. Kyphosis progressed by about 15 degrees if danger signs such as factual separation are absent in conservatively treated patients.

Loss of mineral density, vertebral body collapse and decrease in disc space with indistinct margins are cardinal signs at the time of diagnosis (21). In present study 24 patients had vertebral body destruction, 15 had paradiscal involvement with indistinct margins and 11 had loss of mineral density of vertebral body. In a study conducted by Sadik I Shaikh et al paradiscal involvement of vertebrae was the commonest finding (22).

After completion of AKT 18/50 (36%) patient show bony fusion while 12/50(24%) showed fibrous fusion. 11(22%) patients had sclerotic margins and 9 (18%) patients had normal x rays. Tuli mentions spontaneous bony healing on

AKT is commonest finding which is consistent with the study. He also mentioned fibrous and mixed fusion as common findings (22)

In MRI Paravertebral abscess, neural compromise , marrow oedema, cord oedema are usual findings at diagnosis.(23) In our study 86 % patient had paravertebral abscess, 90 % patient had marrow oedema, 36 % had cord oedema and 40% had cord compression. In a study conducted by A K Jain et al 100% of the patients had paravertebral collections, 22 % had cord oedema.55% had Canal encroachment was present in patients in that study (24). As in the study conducted by A K Jain et al patients in our study on completion of study showed complete disappearance of marrow oedema, epidural abscess, canal compression etc.

## Conclusion

Thoracic involvement due to tuberculosis is the commonest. Treatment of tuberculosis of spine is primarily conservative. Surgical management is required only after failure of conservative management. Patient undergoing surgery may remain with some residual deficit even under expert hands. Pain relief with AKT is a significant indicator of successful treatment.

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