



## EPIDEMIOLOGY OF SPINAL TUBERCULOSIS WITH PRESENTING SYMPTOMS IN A RURAL TERTIARY CARE CENTRE.

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### ABSTRACT

**Aim and Objective:** To study the epidemiology of spinal tuberculosis with presenting symptoms in a rural tertiary care centre.

**Materials And Methods:** We at our institution included 148 patients of spinal tuberculosis for a period of 3 years and at the end of the study, demographic data was evaluated with symptomatology and anatomical consideration.

**Observation And Results:** 37.8% were in the age group of 40-60 followed by 35.1% were of age 21-40 years. Pain was the commonest symptom and Dorsal spine was the commonest vertebrae involved.

**Conclusion:** The prognosis of Spinal tuberculosis has improved over the years. With rapid detection, early intervention with medical and surgical treatment the burden can be reduced in the most populated states of India.

**KEYWORDS :** Spinal tuberculosis, treatment of pott's spine , vertebrae involvement.

### INTRODUCTION

Tuberculosis is a prevalent disease in developing countries and causes significant mortality and morbidity in India. Tuberculosis of spine is the most common and the most severe form of skeletal tuberculosis. Tuberculosis of the spine is prevalent in much of the world, and there is always a trend towards an increase in developing countries. Spinal T.B. covered for about 2% of cases of T.B, there was wide variation in clinical practice for the management of spinal TB.<sup>1</sup> It primarily affects young adults.<sup>2</sup> Multidrug-resistant tuberculosis is not common in spinal disease; there have been a few recent case reports.<sup>3</sup> The spine is the most common skeletal site affected, followed by the hip and knee. Spinal tuberculosis accounts for almost 50% of cases of skeletal tuberculosis.<sup>4</sup> In endemic countries, spinal tuberculosis is more common in children and younger population adults in developed Western and the Middle East countries.<sup>8</sup>

A current estimate of the WHO revealed tuberculosis now kills 3 million people a year worldwide. In India about It is estimated that India one-fifth of the total world population of tuberculous patients. There are about 6 million cases that were radiologically confirmed cases of tuberculosis in India more in the northern region. Nearly 1-2% have involvement of the skeletal system in patients who suffered from T.B. Pulmonary and extra-pulmonary T.B. in Uttar Pradesh and Haryana as notified or 2016 are 297,746 and 47,545, respectively; the incidence increases with association with HIV (2,501 and 447 in UP and Haryana), respectively. The treatment success rate has remained at 70%, which is true in case of the chest tuberculosis and mixed results in Spine Tuberculosis.<sup>5,6</sup> The demographic and clinical characteristics of cases all over the sphere were studied in detail with various presentations of the demography profile; most of the Indian studies concluded male predominance with a mean age around  $40.5 \pm 19.6$  years of age group was between 30 and 50 years. Lesser no of the cases were above 65 years of age. More than 90% of the cases belonged to the low socioeconomic strata for 2016.<sup>7</sup> Patients presented with various presentations of paraplegia, backache, fever, malaise, body ache. History of having pulmonary T.B., contact with a TB-infected person, immunosuppression, HIV infection, cirrhosis, etc.

### AIMS AND OBJECTIVES

1. To study the epidemiology of spinal tuberculosis with presenting symptoms in a rural tertiary care centre.

### MATERIALS AND METHODS

This was a prospective study. All patients with spinal tuberculosis coming to the Department of Neurosurgery, MMIMSR, Mullana, Ambala Cantt, Haryana with effect from September 2018 to

September 2020.

### Organization And Conduct Of The Study

This prospective observational study was carried out in the Department of Neurosurgery at MMIMSR, Mullana, Ambala. Patients diagnosed with a case of spinal tuberculosis were included in this study.

**Study Design:** Prospective Study

**Study Location:** This is a tertiary care teaching hospital-based study in the Department of Neurosurgery, MMIMSR, Mullana, Ambala, Haryana.

**Study Duration:** September 2018 to September 2020

**Sample Size:** 148

### Inclusion Criteria

1. Clinical and radiographic evidence of tuberculosis of the spine
2. Evidence of activity of the disease clinically and radiographically, with or without pulmonary or extra-pulmonary involvement other than the spine, also

### Exclusion Criteria

Only extraspinal tuberculosis

### Methodology

We did all routine Blood tests , X-ray Chest – P.A. view, Mantoux test, Anterior-posterior and Lateral X-rays of the whole spine/C.T. Spine and MRI Whole Spine screening along with other relevant investigations. Two sputum specimen examinations from any patient with radiographic evidence of pulmonary tuberculosis. Examination of pus by Gram Stain and by Ziehl-Neelson technique.

Histopathological study of granulation tissue and bony sequestra was done after surgical procedure, cartridge-based nucleic acid amplification test and Polymerase chain reaction were done. At the end of the study, demographic data was evaluated.

### Statistical Analysis:

Chi-square ( $\chi^2$ ) test was performed, and an exact test was used when the expected frequency is less than 5. A probability value (p-value) less than 0.05 was considered statistically significant. All statistical calculations were done using (Statistical Package for the Social Science) SPSS 21 version (SPSS Inc., Chicago, IL, USA) statistical program for Microsoft Windows.

**OBSERVATIONS AND RESULTS**

**Patient Parameters**

**AGE**

Overall, The maximum number of patients, 56 (37.8%), were in the age group of 40 to 60 years, followed by 52 (35.1%) were of age 21-40 years.

**Table 1. Age Distribution Of Patients**

AGE	No. of cases	Percentage
< 20	20	13.5%
21-40	52	35.1%
41-60	56	37.8%
> 60	20	13.5%
Total	148	100.0%

**Gender**

In the study, there were 148 patients with spinal tuberculosis, out of which 76 (51.4%) were male, and 72 (48.6%) were female.

**Table 2. Gender-based Distribution Of Patients**

Gender	No. of cases	Percentage
M	76	51.4%
F	72	48.6%
Total	148	100.0%

**Presenting Symptoms**

The symptoms are shown in the table 3 in order .

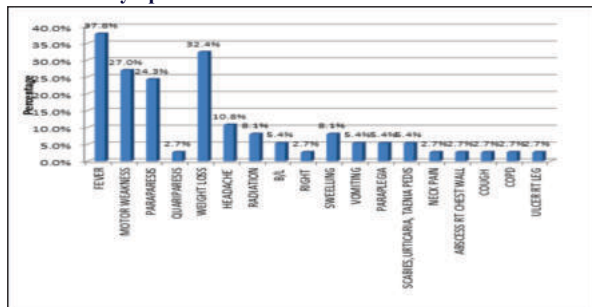
**Table 3. Presenting Symptoms**

PRESENTING SYMPTOMS	No. of cases	Percentage
PAIN	140	94.6%
LOWER BACKACHE	100	75.7%
CERVICAL PAIN	8	5.4%
CHEST PAIN	20	13.5%
MOTOR WEAKNESS	24	16.2%
PARAPARESIS	20	13.5%
QUARIPARESIS	4	2.7%
HEADACHE AND VOMITING	4	2.7%
FEVER	4	2.7%

**Duration Of Symptoms**

In the present study, the maximum number of patients, 72 (48.6%), had a duration of symptoms from 1-6 months, followed by 44 (29.9%) were from <1 month, and 32 (21.6%) were from >6 months.

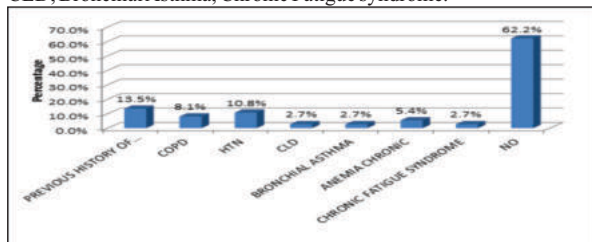
**Associated Symptoms Seen In Patients**



**Figure 1. Associated Symptoms Seen In Patients**

**CATEGORIZATION OF PATIENT ACCORDING TO CTP SCORE**

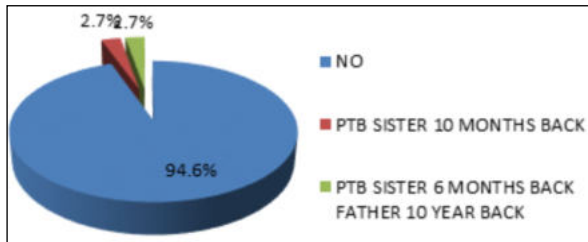
In our study, there were 20 (13.5%) patients who had a previous history of tuberculosis, followed by 16 (10.8%) have hypertension, 12 (8.1%) were have COPD, 8 (5.4%) had chronic anemia, and one patient of CLD, Bronchial Asthma, Chronic Fatigue syndrome.



**Figure 2. Chronic Illness Of Patients**

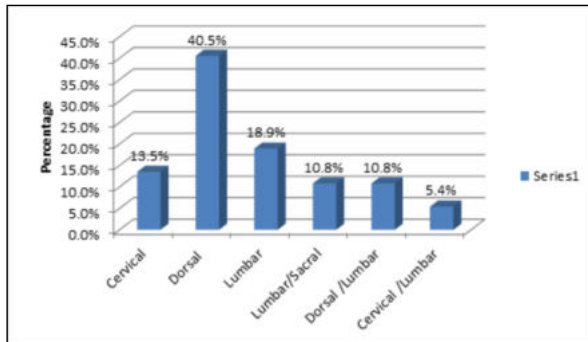
**Family History of Patients**

There were 140 (94.6%) patients who had no family history of symptoms.

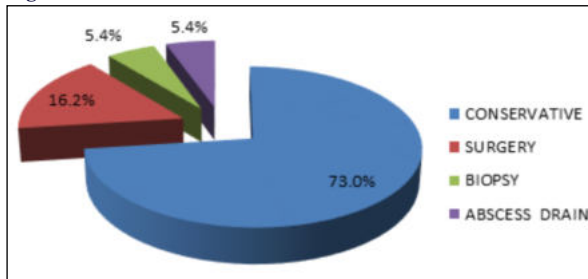


**Figure 3. Family History of Patients**

**Involvement Of Vertebral Bodies.**



**Figure 4. Involvement of vertebrae.**

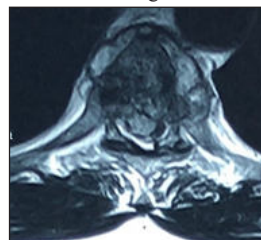


**Figure 5: Management Of The Patients**

**MRI Images**



**Image 1:** Pre Operative MRI (T1W) showing collapsed D12 and L1 vertebrae with epidural collection along with significant compression of the underlying cord and cord changes.



**Image 2:** MRI D4 involvement: Axial T2W image with altered signal and collapse of D4 vertebral body with intraspinal extension and compression of thecal sac. T2 hyperintense well defined pre and para vertebral collection.

**DISCUSSION**

Approximately 10 million people fell ill with tuberculosis in 2018 worldwide. Eight countries accounted for two-thirds of the global burden of tuberculosis, of which India tops the list with 27% of all cases.<sup>8</sup>

We evaluated 148 patients with spinal tuberculosis. The maximum number of patients, 37.8% (56), were in the age group of 40 to 60 years, followed by 35.1% (52) in 21-40 years.

In our study, the mean age of patients was  $40.45 \pm 16.78$  years. Similar findings were seen by Liu et al.<sup>9</sup>, Gupta et al.<sup>16</sup>, and Park et al.<sup>15</sup> (43.7 years, 38.24 years, and  $44.07 \pm 16.57$  years, respectively). Liu et al.<sup>9</sup> observed that the age range was 1–88 years, and 40.7% (561) were aged from 18 to 45 years. The differing observation was made by De la Garza Ramos R et al., the median age of patients was 51 (35-65) years.<sup>10</sup>

In our study, 51.4% (76) were male, and 48.6% (72) were female. Similar results were observed in the study by Gupta et al. there were 50% (25) male and 50% (25) female patients<sup>16</sup>.

Low back pain is a health problem in developing countries, representing one of the most frequent illnesses of mankind. In general practice, back pain accounts for 30–50% of rheumatic complaints. In our case series, 94.6% (140) of patients presented with symptoms of pain [75.7% (100) Lower backache, 5.4% (8) with cervical pain, and 13.5% (20) with chest pain]. 16.2% (24) patients came with symptoms of motor weakness; however, only one patient came with symptoms of headache and vomiting. Liu et al.<sup>9</sup> (92.5%) had shown the most common symptom reported was back pain, and the thoracic spine was the most frequent segment involved. However, Raya SA et al.<sup>11</sup> showed that twelve of the 40 patients (33%) proved to have spinal T.B. as the cause of a backache. Moreover, in a study by Weng CY et al., back pain (100%) was the most common clinical symptom, followed by weakness (53%) and numbness (26%). Although the thoracolumbar junction seems to be the most common site of the spinal column involvement in spinal T.B., any part of the spine can be affected.

In our study, bone degeneration was seen in 95.6% (140) cases. Similarly, in a study by Abou Raya S et al.<sup>11</sup>, osteoarthritic degenerative changes were seen in 8 of the 12 patients with spinal T.B. who were above the age of 65 years. These findings are in contrast to those of Goel et al. study concluded that degenerative changes are the commonest cause of Lower back pain in the elderly and that infective discitis was a rare cause of back pain in older people.<sup>13</sup>

Prolapsed, herniated, or extruded intervertebral disc (PIVD) is a commonly encountered clinical entity. There were 83.8% (124) cases of PIVD in the present study. A similar number of cases, 91.6% (44), were seen in study Jha DK et al.<sup>14</sup>

In our case series, there were 16.2% (24) lesion have involvement of C6 vertebrae, followed by 8.1% (12) have involvement of C5 vertebrae and C4, C3, C2 vertebrae.

Jain et al., in their study, reported Thirty-one patients with 33 lesions of spinal tuberculosis (C1–D4). The distribution of lesions was C1–C2 (11), C3–C6 (13), C7–D4. Neurological complications were present in 55% (6), 61% (8), and 78% (7) in each region, respectively.<sup>15</sup>

In our case series, 60 (40.5%) patients who have involvement of Dorsal vertebrae, Followed by 24 (18.9%) have lumbar vertebrae, 20 (13.5%) of cervical vertebrae, 16 (10.8%) have lumbar/Sacral, Dorsal/Lumbar vertebrae, and 8 (5.4%) patients have Cervical/lumbar vertebrae.

Similarly, Gupta et al. found that the dorsal spine was most commonly affected (72%) while the lumbar spine was involved in only 18% of the cases.<sup>16</sup>

The prognosis of Spinal tuberculosis has improved over the years. With rapid detection, early intervention with medical and surgical treatment, complications can be reduced. They will be helpful to decrease morbidity in the form of paraplegias, and abscess formation controlling tuberculosis spread should be started at presentation of symptoms. As per the data mot of the case in our series are from U.P., to reduce the incidence we must strengthen the preventive programmes to decrease the burden of Tuberculosis in our country.

**Conflict Of Interest:** None declared.

**Study :** Not Funded

**REFERENCES**

- Slater Jr RR, Beale RW, Bullitt EL. Pott's disease of the cervical spine. Southern medical journal. 1991;84(4):521-3.
- Oguz E, Sehirlioglu A, Altinmakas M, Ozturk C, Komurcu M, Solakoglu C, Vaccaro AR. A new classification and guide for surgical treatment of spinal tuberculosis. Int Orthop. 2008;32:127–33.
- Pawar UM, Kundnani V, Agashe V, Nene A, Nene A. Multidrug-resistant tuberculosis of the spine—is it the beginning of the end?: A study of twenty-five culture proven multidrug-resistant tuberculosis spine patients. Spine. 2009;34(22):E806-10.
- Gautam MP, Karki P, Rijal S, Singh R. Pott's spine aPott's paraplegia. J Nep Med Assoc 2005;44(159):106–15.
- Talbot JC, Bismil Q, Saralaya D, Newton DA, Frizzell RM, Shaw DL. Musculoskeletal tuberculosis in Bradford—a 6-year review. The Annals of The Royal College of Surgeons of England 2007;89(4):405-9.
- Isada CA. Spinal tuberculosis deserves a place on the radar screen. Cleve Clin J Med. 2004;71:537-9.
- Cowling K, Dandona R, Dandona L. Improving the estimation of the tuberculosis burden in India. Bulletin of the World Health Organization. 2014;92:817-25.
- Dunn RN, Ben Husien M. Spinal tuberculosis: Review of current management. Bone Joint J 2018;100-B:425-31.
- Liu Z, Wang J, Chen GZ, Li WW, Wu YQ, Xiao X, Zhang YL, Yang Y, Hu WK, Sun ZC, Wang XY. Clinical characteristics of 1378 inpatients with spinal tuberculosis in general hospitals in south-central China. BioMed research international. 2019 March 3;2019.
- De la Garza Ramos R, Goodwin CR, Abu-Bonsrah N, Bydon A, Witham TF, Wolinsky JP, Sciubba DM. The epidemiology of spinal tuberculosis in the United States: an analysis of 2002–2011 data. Journal of Neurosurgery: Spine. 2017 April 1;26(4):507-12.
- Abou-Raya S, Abou-Raya A. Spinal tuberculosis: overlooked?. Journal of internal medicine. 2006 Aug;260(2):160-3.
- Moorthy S, Prabhu NK. Spectrum of M.R. imaging findings in spinal tuberculosis. AJR Am J Roentgenol. 2002;179:979–983.
- Goel V, Young JB, Patterson CJ. Infective discitis as an uncommon but important cause of back pain in older people. Age Ageing 2000; 29: 454–6.
- Jha DK, Thakur A, Jain M, Arya A, Tripathi C, Kumari R, Kushwaha S. Intrinsic vertebral markers for spinal level localization in anterior cervical spine surgery: a preliminary report. Asian spine journal. 2016;10(6):1033.
- Jain AK, Kumar S, Tuli SM. Tuberculosis of spine (C1 to D4). Spinal cord. 1999 May;37(5):362-9
- Gupta AK, Srivastava A, Sengar RL. Epidemiological Study of Thoracolumbar Pott's Spine at a Tertiary Care Hospital in North India. Romanian Neurosurgery. 2018 Jun 15:340-6.