



## Pott's Disease- When & How to Operate?

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### Abstract

**Background:** Pott's disease is a rare form of extrapulmonary tuberculosis that manifests in a variety of clinical patterns. Delays in diagnosis and treatment can lead to serious complications. About 10-40% of patients with spinal tuberculosis may have a neurological deficit. Urgent measures are needed to halt the progression of the disease and deformity, especially to prevent and overcome paraplegia. In regards to management, every case is different and has a unique procedure. It includes simple medical management, simple decompression and debridement, anterior approach, and posterior approach, etc. Surgical decompression of the cord and instrumentation are needed in many cases besides chemotherapy. Although the anterior approach is used for cervical Pott's disease but this procedure is very time-consuming and technically difficult in the lumbar and dorsal spine, especially in compromised patients and morbidity is more. The posterior approach alone is enough for achieving adequate decompression, debridement, reduction, fusion, reconstruction of the body, and maintaining sagittal alignment in the dorsal and lumbar Pott's spine. The aim of the study was to describe the treatment modality and observe the outcome of treatment methods and incidence rate of infection sites among the patients of Potts spine. **Material & Methods:** This retrospective study was conducted at the Department of Neurosurgery, Bangabandhu Sheikh Mujib Medical University, Bangladesh. The study duration was 7 years, from March 2016 to January 2023. During this period, a total of 30 cases of Pott's disease were included in the study following inclusion and exclusion criteria. **Results:** 53.33% had been from the youngest age group of 15-34 years, and 80 % were male. Very few participants had been female in the present study. Back pain was the primary complication for 50% of cases, while spinal infection was observed in the cervical region for 16.67% of cases, 43.33% had infections in the dorsal region, and 30 % in the lumbar region. 10.00% of the participants had been treated with non-surgical methods, with only anti-TB medication for 18 months or more. Posterior decompression was the most common treatment method, with 23.33% having only posterior decompression, and 40.00% having posterior decompression with the use of additional instruments. **Conclusion:** The study observed that Pott's disease was most common among young adult males, and the most common sites of spinal infections were in the dorsal and lumbar regions in the present study population, contradictory to the general findings. Decompression treatment, with and without additional instruments, was the most common form of treatment among the present study population.

**Keywords:-** Tuberculosis, Spinal, Pott's Disease, Infection.



## INTRODUCTION

Tuberculosis (TB) is a bacterial infection spread through inhaling tiny droplets from the coughs or sneezes of an infected person. It mainly affects the lungs, but it can affect any part of the body, including the tummy (abdomen), glands, bones, and nervous system.<sup>[1]</sup> TB is a very ancient disease. Studies of human skeletons show that it has affected humans for thousands of years. Mycobacterium TB (M. TB) was discovered by Dr. Robert Koch in 1882, and since then, about a quarter of the world's population has been infected with M. tuberculosis, equivalent to about 2 billion people.<sup>[2]</sup> Without treatment, the mortality rate from TB is high - 70% mortality within 10 years of diagnosis. A total of 1.5 million people died from TB in 2020 (including 214 000 people with HIV).<sup>[3]</sup> Tuberculosis is the leading cause of death from a curable infectious disease.<sup>[4]</sup> Spinal tuberculosis, also known as Pott's disease or tuberculous spondylitis is the most common and the most serious form of tuberculosis lesion in the skeleton.<sup>[5]</sup> It is a rare form of extrapulmonary tuberculosis and presents with several clinical patterns. Tuberculosis of the central nervous system accounts for approximately 1% of all cases of tuberculosis and 50% of these involve the spine.<sup>[6]</sup> Tuberculous arthritis is believed to result from the extension of an initial infectious focus in the bone to the joint. Infrequently, tuberculous bacilli travel from the lung to the spine along the Batson paravertebral venous plexus or by lymphatic drainage to the paraaortic lymph nodes.<sup>[7,8]</sup> At its active stage, symptoms of tuberculous spondylitis are often insidious. Common symptoms are malaise, loss of appetite and weight, and night sweats. The

involved spine is stiff and painful on movement with a localized humpback. Back muscle spasms are present. Occasionally, patients may have night cries during sleep, as the relaxation of muscle spasms allows for movement between the inflamed surfaces.<sup>[9,10]</sup> among Pott's disease patients, thoracic and lumbar spines are most commonly affected. TB occurs in every part of the world. In 2020, the largest number of new TB cases occurred in the WHO South-East Asian Region, with 43% of new cases, followed by the WHO African Region, with 25% of new cases and the WHO Western Pacific with 18%. In 2020, 86% of new TB cases occurred in the 30 high TB burden countries. Eight countries accounted for two-thirds of all new TB cases: India, China, Indonesia, the Philippines, Pakistan, Nigeria, Bangladesh, and South Africa.<sup>[3]</sup> In Pott's disease, there exist four types of common lesions, that are Paradiscal, anterior, central, and neural arch lesions. The treatment of TB has evolved greatly over the centuries. At present, the incidence of TB and Pott's disease can be managed in various ways depending on severity. Simple medical management with proper medication for 6-12 months can be implemented to treat TB if the diagnosis is done early, and slightly severe cases can be managed by simple decompression and debridement method. The present study was conducted to observe the severity of Pott's disease among TB patients and their appropriate treatment method.

### Objectives

- To understand the infection types of Pott's disease in the Bangladeshi population
- To understand the preferred treatment methods for Pott's Disease in regard to the Bangladeshi population

## MATERIAL AND METHODS

This retrospective study was conducted at the Department of Neurosurgery, Bangabandhu Sheikh Mujib Medical University, Bangladesh. The study duration was 7 years, from March 2016 to January 2023. During this period, a total of 30 cases of Pott's disease were included in the study following inclusion and exclusion criteria. Informed consent was obtained from the participants or their legal guardians via telephone, and ethical approval regarding the study was obtained from the ethical review committee of the study hospital. Anti-TB therapy of at least 18 months was included, and for cervical cases, the anterior approach was preferred. A posterior approach with the instrumentation and 360° fixation was also included. Collected data were analyzed using SPSS software

### Inclusion Criteria

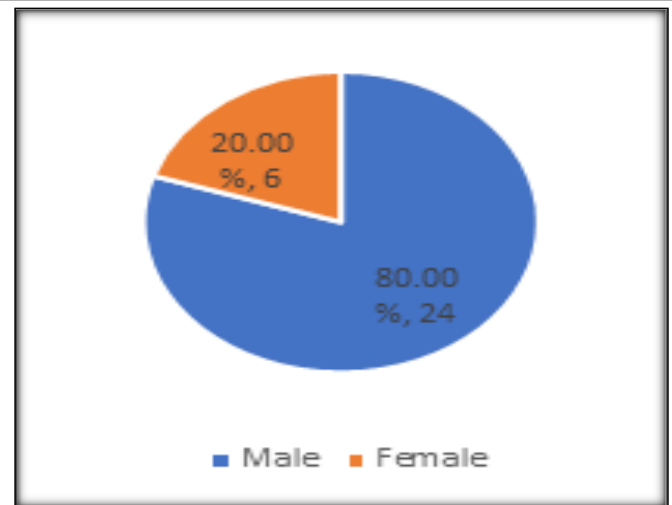
- Patients over 15 years of age
- Anti-TB therapy of  $\geq 18$  months
- Patients who had given consent to participate in the study.

### Exclusion Criteria

- Patients <15 years of age
- Anti-TB therapy of <18 months
- Exclude those affected with other chronic diseases etc.

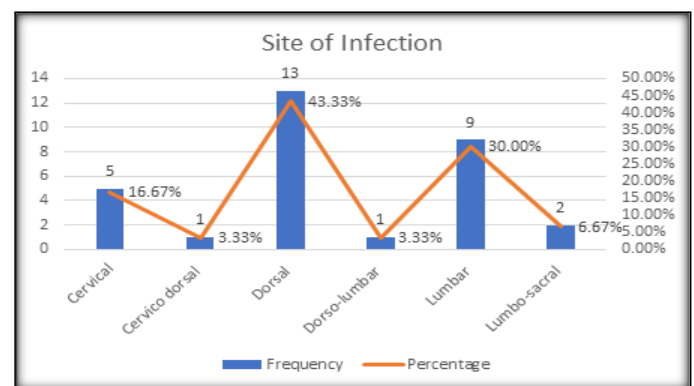
## RESULTS

Majority of the participants (53.33%) had been from the youngest age group of 15-34 years, while 26.67% had been from the age group of 35-54 and only 20.00% had been aged 55 or higher.



**Figure 1:** Gender Distribution of the participants (n=30)

Among the total participants, 80 % were male, and 20% were female, with male: female ratio of 4.2:1.



**Figure 2:** Distribution of the participants by site of infection (n=30)

Among the participants, spinal infection was observed in the cervical region for 16.67% of cases, 43.33% had infections in the dorsal region, 30 % in the lumbar region, 6.67% had an infection in the Lumbo-Sacral region. Infections in the cervicodorsal region and dorso-lumbar region were each observed in 3.33% of patients.

**Table 1:** Age distribution of the participants (n=30)

Age Group	Frequency	Percentage
15-34	16	53.33%
35-54	8	26.67%
≥55	6	20.00%

**Table 2:** Distribution of the participants by presenting primary complaints (n=30)

Complaints	Frequency	Percentage
Back Pain	15	50.00%
Paresis	8	26.67%
Numbness	5	16.67%
Fever	2	6.67%

Among the participants of the present study, back pain was the primary complication for 50% of cases, 26.67% had paresis, 16.67% had numbness and 6.67% had fever.

**Table 3:** Distribution of the participants by performed procedure (n=30).

Name of procedure	Frequency	Percentage
Only anti-TB	3	10.00%
Anterior cervical discectomy and fusion	3	10.00%
Posterior decompression	7	23.33%
Posterior decompression with instrument	12	40.00%
360° fixations	3	10.00%
Interbody fusion	2	6.67%

40.00% of patients had posterior decompression with the use of additional instruments, while 23.33% had posterior decompression without any additional instruments. 10.00% had only anti-TB medicine, another 10.00% had 360° fixation, while Anterior cervical discectomy and fusion were also observed in another 3 patients. 1 patient (6.67%) had an interbody fusion.

## DISCUSSION

Although tuberculosis is uncommon in developed countries, it is still a common cause of vertebral infection in developing countries. Despite advances in early diagnosis and effective management, spinal tuberculosis (TB)

continues to plague medical professionals, particularly in South East Asia, due to an increase in drug-resistant strains. Furthermore, the global migration phenomenon has now opened the doors for this communicable disease in developed countries, as has the constant rise in survivors of chronic medical diseases, and HIV-infected individuals are at high risk for clinically symptomatic disease because they are immunocompromised.<sup>[10]</sup> Depending on the type of Pott's disease, or spinal tuberculosis, the treatment method can greatly vary. Following the GATA classification of spinal tuberculosis, Type I Pott's disease can be treated with simple fine needle biopsy and drug therapy, with



abscess drainage where necessary.<sup>[11]</sup> Type II and Type III Potts disease require further treatment methods, including anterior decompression, correction, decompression, etc. In the present study, among the 30 cases of spinal TB, the majority had been from the age group of 15-34 years, with 26.67% being from the age group of 35-54, and the remaining few were over 54 years of age. This was in line with the general understanding, that Pott's disease occurs more commonly among the younger population.<sup>[12,13]</sup> Male prevalence was also observed in our study, with only 20% female presence in the study. This was similar to the findings of other studies, where a similar male predominance was observed.<sup>[14,15]</sup> However, a study by Shi et al., observed higher female prevalence among TB patients over the age of 30 years. Back pain was the most common form of complaint, observed in half the study population. 26.67% of the participants had complained about leg pain, 16.67% had reported about numbness, and 6.67% had a fever. Back pain is the most common complaint of Pott's disease globally, as recorded in various other studies.<sup>[12,14]</sup> The site of infection varied among the participants, with a total of 6 infection sites, among which 3 were the most common sites. Among the present study participants, the most common sites of infection were Dorsal region (43.33%), Lumbar region (30.00%), and the cervical region (16.67%). The vertebral column is commonly recognized as the most common site of spinal tuberculosis, which was somewhat contradictory to the present study findings.<sup>[16,17,18]</sup> As mentioned before, there exist various methods of treatment for Pott's disease, depending on disease severity. Previous studies have observed that posterior, anterior-posterior, and anterior

surgical approaches are all satisfactory options for the management of cervical tuberculosis.<sup>[19]</sup> In the present study, 40.00% of the participants had posterior decompression with the usage of additional instruments, while 23.33% had posterior decompression without additional instruments. 10.00% had only anti-TB medicine, another 10.00% had 360° fixation, while Anterior cervical discectomy and fusion were also observed in another 3 patients. Decompression has been observed as a common method of treatment for spinal tuberculosis in many other studies as well.<sup>[20,21,22]</sup> Some studies use fusion with decompression to receive better results.

### Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community. As this was retrospective data, specific variables could not be recorded for further analysis.

### CONCLUSIONS

The study observed that Pott's disease was most common among young adult males, and the most common sites of spinal infections were in the dorsal and lumbar regions in the present study population, contradictory to the general findings. Decompression treatment, with and without additional instruments, was the most common form of treatment among the present study population.

### Recommendation

The study was conducted with limited data and short duration. Further study with several follow-ups needs to be conducted to reach a better understanding of the different types of

severity, treatment methods, and their effectiveness. Furthermore, the significance of improvement levels with regards to the

infection site and treatment methods, as well as the significance between infection site and treatment method needs to be analyzed.

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