

Original Research

Assessment of Pott's Spine using MRI

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ABSTRACT:

Background: Percival Pott originally documented a tubercular infection of the spine, often known as tubercular spondylitis or Pott's illness, in 1779. The present study was conducted to assess Pott's Spine using MRI. **Materials & Methods:** 42 cases of tuberculosis of the spine of both genders underwent MRI scan. The scans were done on a 1.5T GE HDE scanner by using T1 Weighted spin echo (T1W) and T2 weighted fast spine echo (T2W) sequences in the sagittal and the axial planes and a fat Suppressed Inversion Recovery (STIR) sequence in the coronal plane. Parameters such as involvement of various segments of spine, occurrence of various pathological processes of tubercular spondylitis etc. were recorded. **Results:** Age group 20-40 years had 15, 40-60 years had 20 and 60-80 years had 7 cases. The difference was significant ($P < 0.05$). The number of vertebrae infected were 1 in 2 cases, 2 in 25, 3-4 in 13 and >5 in 2 cases. Involvement of various segments of spine were cervical in 2, cervico- thoracic in 2, dorsal in 15, dorso- lumbar in 3, lumbar in 18 and lumbo- sacral in 2 cases. Occurrence of various pathological processes were GIBBUS deformity in 12, IV disc involvement in 31, paravertebral collection in 28, epidural collection in 25, cord edema in 4 and PSOAS abscess in 15 patients. The difference was significant ($P < 0.05$). **Conclusion:** The most effective way to identify early disease is with magnetic resonance imaging (MRI), which is also the tool of choice for determining the level of infection and its activity. In situations of spinal TB, it can also serve as a guidance for surgical treatment.

Keywords: MRI, Pott's Spine, tubercular spondylitis

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INTRODUCTION

Percival Pott originally documented a tubercular infection of the spine, often known as tubercular spondylitis or Pott's illness, in 1779. Ancient Egyptian and Peruvian mummies have also been found to have this condition.¹ The Mycobacterium TB bacteria is the cause, and the infection is typically disseminated hematogenously through the venous plexus of Batson.² The World Health Organization estimates that in 2006, around 2 billion people, or one-third of the global population, suffered with tuberculosis, and that the disease claims the lives of 2 million people globally each year. It continues to be the leading cause of high morbidity and mortality in emerging nations with dense populations.³

In the western world, tuberculosis incidence has decreased, but in these nonendemic populations, it has

recently showed a resurgence. Its worldwide frequency has also increased, especially in people with impaired immune systems, at a rate of about 1.1% year.⁴ The Human Immunodeficiency Virus (HIV) epidemic, inadequate nutrition, drug addiction, alcoholism, the emergence of drug-resistant strains of tuberculosis, ineffective tuberculosis control programs, overcrowding, and increased migration appear to be the primary causes of the rise in tuberculosis cases worldwide. Approximately 10.7 million individuals globally are infected with both HIV and TB.⁵ Epidemiologically sensitive characteristics are intimately linked to the incidence of tuberculosis and have the power to modify the occurrence of different tuberculosis clinical stages. Usually beginning in the cancellous bone of the vertebral body, anteriorly beneath the periosteum, the

infectious process in the vertebra eventually spreads to the intervertebral disc and other vertebral regions.⁶ The vertebra's body collapses as a result of the bone-damaging process, and its wedging also occurs. Granulation tissue and necrotic material are formed as a result of the immune response triggered by the infectious process, and they accumulate in the surrounding soft tissue planes and the lytic zones of the bone. An abscess may arise if the infectious process spreads straight into the psoas muscle.⁷The present study was conducted to assess Pott's Spine using MRI.

MATERIALS & METHODS

The study was carried out on 42 cases of tuberculosis

of the spine of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. All patients underwent MRI scan. The scans were done on a 1.5T GE HDE scanner by using T1 Weighted spin echo (T1W) and T2 weighted fast spine echo (T2W) sequences in the sagittal and the axial planes and a fat Suppressed Inversion Recovery (STIR) sequence in the coronal plane. Parameters such as involvement of various segments of spine, occurrence of various pathological processes of tubercular spondylitis etc. were recorded. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Age- wise distribution of cases

Age group (years)	Number	P value
20-40	15	0.03
40-60	20	
60-80	7	

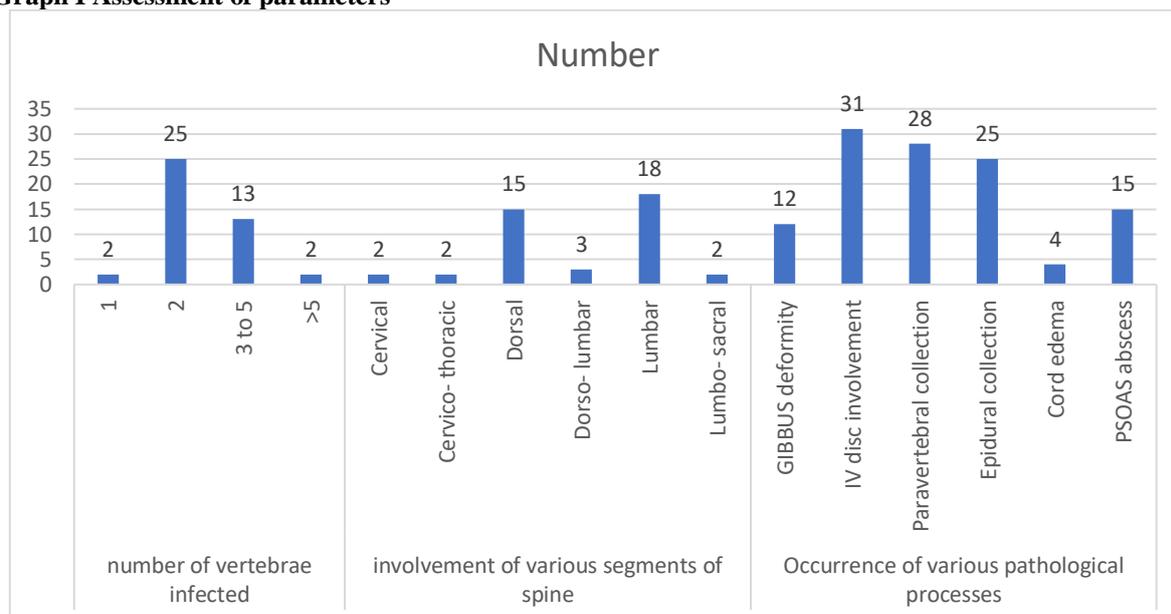
Table I shows that age group 20-40 years had 15, 40-60 years had 20 and 60-80 years had 7 cases. The difference was significant (P< 0.05).

Table II Assessment of parameters

Parameters	Variables	Number	P value
number of vertebrae infected	1	2	0.02
	2	25	
	3-4	13	
	>5	2	
involvement of various segments of spine	Cervical	2	0.01
	Cervico- thoracic	2	
	Dorsal	15	
	Dorso- lumbar	3	
	Lumbar	18	
	Lumbo- sacral	2	
Occurrence of various pathological processes	GIBBUS deformity	12	0.05
	IV disc involvement	31	
	Paravertebral collection	28	
	Epidural collection	25	
	Cord edema	4	
	PSOAS abscess	15	

Table II, graph I shows that number of vertebrae infected were 1 in 2 cases, 2 in 25, 3-4 in 13 and >5 in 2 cases. Involvement of various segments of spine were cervical in 2, cervico- thoracic in 2, dorsal in 15, dorso- lumbar in 3, lumbar in 18 and lumbo- sacral in 2 cases. Occurrence of various pathological processes were GIBBUS deformity in 12, IV disc involvement in 31, paravertebral collection in 28, epidural collection in 25, cord edema in 4 and PSOAS abscess in 15 patients. The difference was significant (P< 0.05).

Graph I Assessment of parameters



DISCUSSION

Tuberculosis is the most common infection in the third world countries. It is commonly pulmonary but extra pulmonary disease is more common in children.⁸ About 5- 10% of patients have bone and joint infection. Fifty percent of patients with bone & joint tuberculosis have spinal tuberculosis called Potts disease.⁹ The infection reaches the spine via respiratory tract or intestine by blood stream. The infection begins from the anterior part of vertebral body, spreads to the disc and causes bone destruction and formation of abscess.¹⁰ Culture and sensitivity is positive in 80% of cases. Abscess spreads beneath the anterior longitudinal ligament and the intervertebral disc is involved with subsequent loss in disc height. As the vertebral bodies collapse into each other, a sharp angulation (or Kyphos) develops.¹¹

We found that age group 20-40 years had 15, 40-60 years had 20 and 60-80 years had 7 cases. Gehlot et al¹² in their study MRI scans of 70 known cases of tuberculosis of the spine were retrospectively analyzed, to determine the pattern of occurrence of various pathological lesions. It was found that Pott's spine was most commonly observed in the 21-50 years age group, with a male predominance. The dorsal and the lumbar vertebrae are commonly involved and multiple vertebrae were often affected, the L3 vertebra being the commonest. An intervertebral disc involvement and pre and paravertebral collections were commonly seen, with an epidural collection occurring in more than 75 % of the cases. Cord oedema was noted in 10% of the cases We found that number of vertebrae infected were 1 in 2 cases, 2 in 25, 3-4 in 13 and >5 in 2 cases. Involvement of various segments of spine were cervical in 2, cervico- thoracic in 2, dorsal in 15, dorso- lumbar in 3, lumbar in 18 and lumbo- sacral in 2 cases. Occurrence of various pathological processes

were GIBBUS deformity in 12, IV disc involvement in 31, paravertebral collection in 28, epidural collection in 25, cord edema in 4 and PSOAS abscess in 15 patients. Bajwa et al¹³ evaluated the role of MRI in assessing the extent of disease in spinal tuberculosis. This study was carried out on 60 cases of tuberculosis spine seen through out patients and admitted through accident & emergency department of DHQ- Hospital. There were 33 Males (55%), 27 Female (45%) Age range was 14-36 years. Mean age was 33 years. Most common symptom was backache in 38 cases (63%). Spinal cord compression was found in 16 cases (26.6%). Most commonly affected level was thoracolumbar spine (45%). Diffuse involvement was rare and only 3 cases (05%) were having more than one level involvement. Plain radiography was the primary imaging modality. MRI was the most valuable investigation. MRI findings of tuberculosis spine were reduced intervertebral disc space (95%) cases. wedge collapse of body 18 (30%), complete destruction of body 12 (20%), paraspinal abscess 24 (40%). Calcification in 18 (30%) and cord compression 16 cases (26.6%).

Owolabi LF et al¹⁴ evaluated the clinical and radiological profile of tuberculosis of the spine. Eighty- seven patients were recruited. There were 57 males and 30 females (M: F = 2: 1), their age ranged between 15 – 70 years and the mean age was 41.3 + SD 15.2. Farmers were mostly affected (23%). Seventy five percent of the patients presented more than 2 months after the onset of the illness. Paraplegia/paraparesis, sensory impairment over the lower limbs (100%) and back pain (90.8%) were the most common features. Nine (13.4%) patients had cauda equina syndrome and 3 (3.4%) had cold psoas abscess. Ten (11.5%) patients had been treated for pulmonary tuberculosis previously, 10 (11.5%) patients had concomitant pulmonary TB. Fifty- eight

(66.7%) patient had paraplegia. Twenty (23%) patients had normal findings on spinal X-ray. The shortcoming of the study is small sample size.

CONCLUSION

Authors found that the most effective way to identify early disease is with magnetic resonance imaging (MRI), which is also the tool of choice for determining the level of infection and its activity. In situations of spinal TB, it can also serve as a guidance for surgical treatment.

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