Frequency of Spinal Tuberculosis in Patients with Complaint of Backache on Magnetic Resonance Imaging

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Abstract

Background: MRI is an effective method for evaluating patients presenting with spinal TB. It is non-ionizing and non-invasive; has a high sensitivity, and therefore it can also be useful in the follow-up of patients with spinal TB.
Objective: To determine the frequency of spinal Tuberculosis in patients complaining of back pain and a history of weight loss on MRI in the Radiology Department of Nishtar Medical University, Multan.
Methodology: Study Design: Cross-sectional study. Setting: Radiology Department of Nishtar Medical University Multan. Duration: From June to December 2023. All male and female patients having radiating back pain and a history of weight loss were included in this study. They were referred for MRI study by senior neurologists and from Neurology, Orthopedics ward, and OPD. A total of 102 patients were selected for this study, informed verbal consent was taken and MRI reports were interpreted by Consultant Radiologist. All data was recorded on a predesigned proforma which included questions about age, history like previous pulmonary TB, GIT infection, or any spinal deformity.
Results: Out of 102 patients, only five (4.9%) were having spinal TB. The mean age of patients was 43.93±14.63 years. Out of 102 patients, only 17 (16.7%) patients were having a history of pulmonary TB. Out of 102 patients, 10 (9.8%) patients were having paravertebral abscess formation. This study shows that out of 102 patients complaining of backache, diagnosed on Magnetic Resonance Imaging only 22 (21.6%) patients had spinal deformity.
Conclusion: This study found that a notable proportion of patients complaining of back pain and weight loss, have TB as diagnosed on Magnetic Resonance Imaging.

Keywords: Spinal TB, Back Pain, MRI
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Introduction

Spinal Tuberculosis can manifest as either a complicated or an uncomplicated case. In a complicated TB, most patients usually with some deformity, or instability, and any neurological deficit.[1] In a typical uncomplicated spinal TB the diagnosis mostly is completed before the development of any such complications. Backache is one of the quite common symptoms.[2] During the course of an active stage, it is mainly caused by the inflammation of the bone involved and sometimes may manifest as a radicular form. The intensity of the pain caused is due to and proportional to the extent of the bone destruction and related instability.[3] Usually low back pain, a low-grade fever, accompanied by weight loss, and sweating at night are reported common symptoms of spinal TB.[4] The most preferred imaging for spinal TB is found to be an MRI scan. In spinal TB cases, typical findings which are encountered include lesions located in vertebral end plates, or the anterior involvement of the body of vertebra, spread towards the subligamentous area, paraspinal cold mostly lacking the sign of the acute inflammation, abscess or calcifications. It also includes vertebral bodies, and vertebral body destruction leading to a collapse while the disc remains protected.[5] MRI findings of spinal TB may be used for a follow-up.[6] Spinal tuberculosis (TB) has been reported in about 2% of total TB patients and about 50% of the skeletal involvement by TB.[1] Most of the patients involved have lesions in the lower thoracic and the upper lumbar vertebra.[2] Spinal TB due to destruction of the vertebral body posterior elements, pars interarticularis causes a deformity, spondylolisthesis, sometimes leading to paraplegia.[5] Most of the time the patient's history along with clinical examination, and X-ray film, are sufficient for the diagnosis, however, early CT scan and Magnetic Resonance Imaging (MRI) are useful.[4,5] As far as treatment is concerned mainly

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anti-TB drugs play a curative role but sometimes surgery may be necessary in case there is spinal compression or some neurological deficits, along with instability, advanced kyphosis deformity, or resistance to the drug.[6] The main purposes of the surgery are debridement, grafting, and sometimes internal fixation. Spinal TB presents in different forms and it may be slow in onset and slow in progression. Thus a diagnostic period can vary from weeks to many years. The clinical manifestation of spinal TB thus represents the severity and the duration of the disease, its site, and its presence which includes abscess or sinus formation, deformity, and in some cases neurological deficit.[7]

Plain radiographs usually have a poor role during early diagnosis of spinal TB.[8] As the disease progresses narrowing and rarefaction of the vertebral end plates may be observed but further destruction causing kyphosis and instability could only be done in the late stages. Computed Tomography (CT) also shows vertebral destruction earlier than plain radiographs. It is very helpful in diagnosing bony or joint destruction, and posterior column involvement.[9,10,11] The rationale behind studying the frequency of spinal TB in patients presenting with backache on MRI is: to understand the impact of this condition. By investigating this, we can improve early detection and treatment strategies and to enhance diagnostic accuracy and ensure timely intervention. The objective of the study was to determine the frequency of Spinal TB in patients complaining of backache and weight loss on MRI in the Radiology Department of Nishtar Medical University Multan.

Methodology

This study was a cross-sectional study, which was conducted at the Department of Radiology, Nishtar Medical University, Multan in a duration of six months from June to December 2023 after the approval for Ethics considerations from the Institutional Review Board. (Ref. No.15/IRB/NMC, Dated: 13-04-2023). A total of 102 patients having complaints of back pain with either sex having radiating back pain and a history of weight loss were included in this study. Exclusion criteria included patients with Stents, patients with pacemakers, and patients with surgical implants. They were referred for MRI study by Senior Consultant and from Neurology or Orthopedics ward, and Outpatient. These patients were selected by convenient sampling technique and for this study. Informed verbal consent was taken and MRI reports were interpreted by Consultant Radiologist. All data was recorded on a predesigned proforma which included questions about age, history like previous pulmonary Tuberculosis, GIT infection, or any spinal deformity.

Study variables included socioeconomic status: urban/rural, Pulmonary infection: yes/no, Abscess: yes/no, Spinal deformity: yes/no, and presence or absence of spinal tuberculosis lesions as diagnosed on Magnetic Resonance Imaging. All data was analyzed in a computer-based program SPSS version 23, and results were obtained in textual, graphical, and tabular form.

Results

The current study was carried out with the aim of determining the frequency of Spinal Tuberculosis in patients complaining of backache and a history of weight loss on Magnetic Resonance Imaging. Overall 102 patients were included in this study. The mean age was 43±14 years. The median and mode age were 45 years. The minimum age was 22 years and the maximum was 75 years. Table-I shows the demographic variables of the study subjects.

Table I: Demographic Variables of the Study Subjects

Variable	Number	Percentage
Gender		
Female	43	42.2
Male	59	57.8
Total	102	100
Residence		
Urban	46	45.1
Rural	56	54.9
Total	102	100

Table-I shows that out of 102 patients, 59 (57.8%) were males complaining of back pain, and out of 102 patients, 56 (54.9%) patients belonged to rural areas.

Table-II shows that out of 102 patients, only 17 (16.7%) patients were having a history of pulmonary TB. This table shows that out of 102 patients, 10 (9.8%) patients were having paravertebral abscess formation. This study shows that out of 102 patients complaining of backache, diagnosed on Magnetic Resonance Imaging only 22 (21.6%) patients were having spinal deformity.

Table II: Frequency of Pulmonary Tuberculosis, Abscess, and Spinal Deformity

Variable	Male	Female	(Percentage)	P Value
Pulmonary Tuberculosis				
No	47 (79.66%)	38 (88.37%)	85 (83.3%)	0.24
Yes	12 (20.33%)	5 (11.62%)	17 (16.7%)	
Total	59 (100%)	43 (100%)	102 (100%)	
Abscess				
No	54 (91.52%)	38 (88.37%)	92 (90.2%)	0.59
Yes	5 (8.47%)	5 (11.62%)	10 (9.8%)	
Total	59 (100%)	43 (100%)	102 (100%)	
Spinal deformity				
No	49 (83%)	31 (72%)	80 (78.4%)	0.18
Yes	10 (17%)	12 (28%)	22 (21.6%)	
Total	59 (100%)	43 (100%)	102 (100%)	

Table-III shows disk bulges in patients presenting with back pain on Magnetic Resonance Imaging.

Table-III: Frequency of disk Bulge among Study Subjects.

Vertebra	Frequency	Percentage
Thoracic vertebra	11	10.8
Thoracolumbar junction	9	8.8
Lumbar vertebra	29	28.4
Lumbosacral junction	32	31.4
Sacral vertebra	11	10.8
No deformity	10	9.8
Total	102	100

Figure I: Frequency of Spinal Tuberculosis

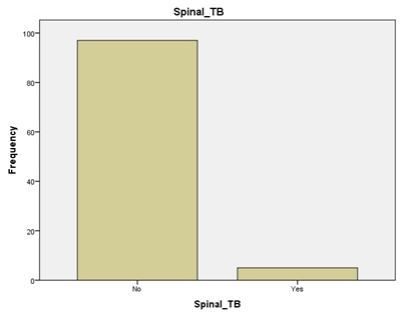

Figure-I shows that out of 102 patients complaining of backache on Magnetic Resonance Imaging only 5 (4.9%) patients were having spinal Tuberculosis.

Discussion

This study assessed the frequency of spinal Tuberculosis in patients complaining of backache as diagnosed on Magnetic Resonance Imaging. It was a hospital-based study in which 102 patients were taken, who were advised for an MRI study by senior Radiologist. The mean age of patients was 43.93, median 45, and mode 45 with a Standard deviation of 14 years. In the current study, 102 patients with back pain were studied, out of which 5 patients had spinal TB. Out of these 5 patients 4 patients (80%) had abscesses, 20% had pulmonary TB, 80% had spinal deformity and 80% patients belonged from rural areas.

A study was conducted by Yusuf et al[10] in 2019, the aim of the study was to determine red flags for spinal TB for its early detection in patients complaining of backache. papers of spinal TB patients were studied out of which 62% were male 37% were female, 19% had a preexisting infection, 19.9 had a history of pulmonary TB, 30% had a spinal deformity and 46% belonged to rural areas of developing endemic countries.[10] Another study was conducted in China by Zheng Liu[11] in which 1378 patients with spinal TB with a mean age of 43.7 years. Back pain was the most common symptom. The history of pulmonary TB was present in 26.6%. The frequency of spinal TB was increased in older and urban patients.[11] The differences between these and current studies are due to more prevalence of TB in developing countries than in developed countries, limited sample size, less duration of study, and minimal medical resources. In the modern era, spinal tuberculosis has generally good outcomes with all treatment modalities, with approximately 90% showing improved outcomes (pain, neurologic recovery, and deformity) after medical and/or surgical management.[8,9]

It has been found that the guidelines that are currently followed for the management of spinal TB derive their logic from the clinical trials on pulmonary disease. Although some studies were conducted among the patients with spinal TB, however, most of these were conducted in the era before the short course of chemotherapy and modern-day radiological and surgical advances.[12] While the patients with spinal TB are primarily treated medically, in some cases surgical intervention is mandatory. There is a substantial delay that occurs in the diagnosis that not only occurs in developing but in developed countries as well, leading to considerable morbidity. There is a need for

recognition of the individualization of various aspects of diagnosis and its treatment, highlighting the limitations of many diagnostic and radiological modalities.[12] A study[13] conducted recently showed that the high diagnostic accuracy of magnetic resonance imaging in diagnosing spinal tuberculosis, which favored our study as well in that our findings also showed a substantial number of the spinal TB patients were diagnosed on Magnetic Resonance Imaging.

Conclusion

It is concluded that the frequency of Spinal Tuberculosis in patients complaining of backache and weight loss on Magnetic Resonance Imaging is remarkable. It shows that one patient in every twenty male and female patients with a history of back pain and weight loss has spinal Tuberculosis. It is suggested that a timely Magnetic Resonance Imaging should be done to assess and treat Spinal Tuberculosis.

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All authors critically revised and approve its final version.

Conflict of Interest: No conflict of interest among authors.

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