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Research Article

**STUDY TO KNOW THE IMPORTANCE OF MAGNETIC RESONANCE  
IMAGING IN DETERMINING THE EXTENT OF DISEASE IN SPINAL  
TUBERCULOSIS**<sup>1</sup>Dr. Muhammad Zeeshan Haider, <sup>2</sup>Dr. Durr e Shehwar, <sup>3</sup>Dr. Muhammad Zubair  
<sup>4</sup>Dr. Hannan Raza Khan,<sup>1</sup>Islam Medical College, Sialkot<sup>2</sup>Sheikh Zayed Medical College & Hospital, Rahim Yar Khan<sup>3</sup>Liaquat National Hospital, Karachi<sup>4</sup>Aziz Fatimah Medical College & Hospital, Faisalabad**Abstract:**

**Objective:** To know the importance of Magnetic Resonance Imaging in evaluating the expansion of disease in tuberculosis of Spine.

**Study Design:** A descriptive study.

**Place and Duration:** In the Surgery and Orthopedic Department of Nishtar Hospital, Multan from July 2016 to July 2017 for one year period.

**Method:** 60 patients with tuberculosis of the spine were selected for the study who were referred to the Orthopedic and Surgery Department of Nishtar Hospital, Multan. Total males were (55%) 33, females were 27 (45%) and 14-36 years was the age range. The average age was 32. Patients' clinical characteristics were recorded in pre-designed Performa and detailed data was collected. In this study, we included spinal TB diagnosed cases. Non-tuberculous spondylitis Patients were not included in the study.

**Findings:** The most common symptom was 38 cases of low back pain (63%). The compression of the spine was detected in 17 cases (27.06%). The thoracolumbar spine (45%) most commonly affected. There was more than one involvement in only 3 cases (05%) and diffuse involvement occurs rarely. For primary imaging modality Plain radiography was done. Magnetic resonance is the most precious research. The magnetic resonance of the tuberculous spine was reduced in the intervertebral disc space (95%). body 13 (19.9%), body wedge 18 (30%), paraspinal attachment 25 (40.1%) completely destroyed. Card compression was 16 (26.6%) and Calcification was 18 (30%).

**Conclusion:** Magnetic resonance imaging is the most important research for diagnosing spinal tuberculosis patients. It provides information about disease grading and is therefore used as a tool for surgical treatment. During follow-up of Tb spine patients MRI is also used to monitor treatment response.

**Key Words:** MRI, tuberculous spine, spondylitis.

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**INTRODUCTION:**

Tuberculosis is a chronic infection that annoys people throughout the recorded history. It is today still very often. The main cause of high mortality and morbidity is infection, especially in developing countries with high population, than other infections in the world. In third world countries, most common infectious disease is Tuberculosis. The pulmonary Tb is common, but in children extra pulmonary disease is much common. bone and joint TB infections occurs in about 5-10% of patient. With joint and bone tuberculosis 50% of patients have TB spine called packaged bottles. Through respiratory tract, the infection reaches the vertebra or via blood stream in the intestine. From the anterior portion of the vertebral disc infection starts, extends to the discs and results in destruction of bone and abscess formation. In 80% of cases, Sensitivity and Culture is positive. The abscess extends under the intervertebral disc and anterior longitudinal ligament causes backward loss of disk height. As the vertebral bodies collapse together, or Kyphosis or acute angulation develops. cold and Cavity formation may extend to the adjacent vertebrae or escape the soft tissue of paravertebra. There is a significant danger of damage to cord because of abscess, ischemia of spinal joint thrombosis or pressure, displaced bone. These potts are called paraplegia. Paraplegia may develop in 20 to 25% of cases. The non-traumatic paraplegia most common cause in most of the world is Tuberculosis. About one-third of the world's population according to the World Health Organization (WHO) has tuberculosis, nearly two billion people. Every year, one million people are affected by tuberculosis and 2 million people die worldwide (data from WHO 2006). This increase was associated with a simultaneous increase in joint and bone tuberculosis. TB Spine is an important health issue in developing countries. This is the most dangerous and common type of musculoskeletal tuberculosis. In every TB spine patient primary imaging modality used is Simple film radiography. For detecting early disease, MRI is the most important tool and for describing the extent and activity of the infection it is the preferred technique. Not only bone involvement, but also the swelling of soft tissues may diagnosed. The abscess can be excluded or detected. Subperiosteal edema is easily visible. To assess treatment multiple MRI studies are used and are very helpful in the treatment of multilevel infection. Tuberculosis MRI features

infection are paraspinous mass, soft tissue edema, vertebral collapse, kyphosis and disc space narrowing after destruction. It is difficult to recognize between pyogenic spondylitis and tuberculosis. Discs are prematurely destroyed by tuberculosis and simple infection. Calcification indicates tuberculosis when available. The aim of the study is to assess the importance of MRI in evaluating the extent of the disease. Magnetic resonance imaging was also used serially to evaluate the infection healing process.

**MATERIALS AND METHODS:**

This descriptive study was held in the Surgery and Orthopedic Department, from July 2016 to July 2017 for one year period. 60 total patients were included. The inclusion criteria included patients from both sexes, age range 14 to 46 years, and only tuberculosis spondylitis cases. Non-tuberculous spondylitis patients were not included in the study. A performance is designed for operation. Based on clinical examination and history the diagnosis was made. The included tests were ESR, CBC, X-ray thorax, sputum cytology (to confirm pulmonary tuberculosis evidence in all cases). The study was based on magnetic resonance of the spine to know the tuberculosis different features radiologically. Simple radiography was performed as the primary imaging modality in all cases. No computerized tomography, myelogram or bone scan was performed in any of the patients.

**RESULTS:**

60 total patients were included in this study. There were 27 females (45%) and 33 males (55%). The age range was between 14 and 46. The average age was 33. Magnetic resonance imaging showed that the spine mostly affected in the 27 cases in the lower and upper thoracic (46%). In 14 (23.3%) of cases thoracic spine was affected only. Lumbar spine has 12 cases (20%). In four cases (6.6%), cervical spine tuberculosis was detected. There was widespread involvement in 3 cases (5%). Magnetic resonance showed that in 95% of cases intervertebral disc space inlet narrowed. Back pain was the most common symptom. Local sensitivity was the most common sign. In 16(26.6%) patients Compression was seen in the spinal cord. The magnetic resonance of the spinal column showed that the disk area was narrowed / destroyed in 95% of cases. Body shrinkage is by 30%.

Table-I: Region wise distribution of TB spine cases (n=60)

Region	No. of Cases	Percentage
Cervical	4	6.6%
Thoracic	14	23.4%
Thoraco lumber	27	45%
Lumber	12	20%
Diffuse involvement	3	5%

In 20% of cases Complete destruction of the body occurs. In 40% of the cases, parapsinal abscess, spinal cord compression in 26.6% and calcification in 30%. The TB wise distribution backbone region is given in Table-I.

### DISCUSSION:

Spine tuberculosis has become a common orthopedic and neurological problem until the middle of the last century for the developing world. In the 60's and 70's the prevalence of disease in developed countries decreased due to the effectiveness of the public health program and advances in chemotherapy. Tuberculosis of the spine is more common than the developed countries in the developing countries. Predominance of differences, literacy, poverty, malnourished conditions, unbalanced diet, overpopulation, low budget for health and high prevalence of pulmonary tuberculosis. Male sovereignty and the clinical onset pattern demonstrated in this study are summarized in Jalleh R.D. It is consistent with the observation made by Regional distribution of vertebra Bikha Ram, Tulsi S.M. Plain radiography plays an important role in the diagnosis of most spinal TB cases. Magnetic resonance imaging is the most valuable tool for early detection of infection. She showed swelling of soft tissues with bone involvement. It has been discovered that MRI is the most valuable research for the evaluation and treatment of spine TB. In patients with spinal TB, the clinician provides the following information.

1. Participation site
2. Paravertebral soft tissue swelling / abscess / disk sequestration
3. Number of relevant vertebrae
4. Kyphosis angle
5. The size of the vertebral canal
6. Cord compression grade
7. Gravity of bone disease: wedge / compression fracture. Although magnetic resonance imaging is an expensive research, simple tissue x-ray provides more information about soft tissue involvement and spinal cord or compaction grade of compression compared to computed tomography. It provides a guide to your illness and therefore treatment. It is

useful to monitor treatment response using serial MRI scans. Conservative treatment with chemotherapy in early diagnosed cases is good. Antituberculous drugs can reach the tuberculous material and the cavities in the spine. However, if there is significant bone involvement with cord or root compression, the only treatment option is surgical treatment.

### CONCLUSION:

We concluded that the MRI spine is the most valuable research for the evaluation of spinal tuberculosis. It provides information about the degree of involvement of soft tissues and bones and helps as a staging procedure to plan treatment. Serial MRI helps to check the cure response with scans.

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