



Retrospective Analysis of Musculoskeletal Complications in Patients with Tuberculosis

Hosseinian Amiri Aref¹, Abedi Siavash², Yazdanian Maryam³

¹Department of rheumatology, Imam Khomeini hospital, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

²Department of pulmonology, Imam Khomeini hospital, Faculty of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

³MA Educational Psychology Student, Sari Azad university, Mazandaran, Sari, Iran.

ABSTRACT

Background: In adults, Osteoarticular involvement with *M. tuberculosis*, usually occurs from either a quiescent pulmonary focus or an extrapulmonary site. The definitive diagnosis is made by the demonstration of *M.tuberculosis* in tissue or synovial fluid. Common presentations of osteoarticular tuberculosis are spinal TB, Infection at peripheral joint especially weight-bearing joints, tendons, bursae, or bones and Reactive arthritis (Poncet's disease). **Aim:** The aim of this study was analysis of 10 adult patients with tuberculosis to determine the pattern of musculoskeletal complications during 2 years. **Subjects and Methods:** This is a retrospective study of cases of musculoskeletal complications among patients with tuberculosis during two years that refers to rheumatologic clinic of mazandaran university of medical sciences at January 2011 to December 2013. Data were analyzed using the SPSS version 20. Variables analyzed include age, sex and kind of musculoskeletal complications. **Results:** There were 10 patients with tuberculosis refers in our rheumatologic clinic for musculoskeletal complications. All of patients were adults between 18 to 48 years old with median age of 30.8 years old. Seven (70%) patients were male and 3(30%) patients were female. The most common musculoskeletal complication was spondylodiscitis in 6 (60%), arthritis in 5 (50%), osteomyelitis in 2 (20%), reactive arthritis in 2 (20%), soft tissue abscess in 2 (20%) and dactylitis in 1 (10%) of patients. **Conclusion:** Musculoskeletal complications are very important and must be considered in patients with tuberculosis. Spondylodiscitis (pott's disease) and arthritis of weight bearing large joints are the most common rheumatologic complications of this disorder.

Key words: Musculoskeletal complications, Spondylodiscitis, Tuberculosis, Peripheral arthritis, Poncet's disease.

INTRODUCTION

Mycobacterial tuberculosis Infection usually acquired by inhalation, and cause nonspecific pneumonitis, followed by lymphatic and hematogenous spread to other organs such as musculoskeletal system. Reactivation of bacilli in dormant foci may occur during a period of diminished host immunity, and spread via lymphatics or blood.¹

Overallly osteoarticular involvement occurs in about 5% of patients with tuberculosis,¹ with estimated percentages ranging from about 2% in the United States to more than 6% in developing countries.¹

In adults, bone infection usually occurs from either a quiescent pulmonary focus or an extrapulmonary site. The classic presentation of musculoskeletal tuberculosis is spondylodiscitis or Pott's disease.

Peripheral joint arthritis especially in weight-bearing joints, tendons and bursae involvement and osteomyelitis also occur. Reactive arthritis (Poncet's disease) has been reported.² Thoracic vertebrae are involved most frequently, followed by lumbar, and, less commonly, cervical and sacral vertebrae.³ Tuberculosis nfection often begins in the anterior portion of the vertebral bodies, with subsequent disc involvement and destruction of vertebral end plates causing the characteristic gibbus deformity.⁴ Sometimes infection extends to adjoining discs or vertebrae, or to distant sites. Localized soft tissue inflammation such as paravertebral or psoas abscesses or sinus tracts may cause neurologic injury. Spinal TB can mimic vertebral osteomyelitis caused by pyogenic bacteria.⁵ Radiography of spine show disc space narrowing with vertebral collapse and paraspinous abscess.⁴

Peripheral joint arthritis often occurs as monoarticular arthritis affecting weight bearing joints as hip or knee, but may involve other joints.⁶ Most patients in tuberculous arthritis are middle-aged or older and often with underlying medical disorders and the onset of disease is typically insidious.⁷ Articular TB is usually due to reactivation of a hematogenously seeded focus and sometimes can also spread from adjacent osteomyelitis. Tuberculous osteomyelitis can occur without joint involvement and metaphysis of long bones are

About Author :

Mr. Aref Hosseinian Amiri
Department of Rheumatology
Imam Khomeini hospital, Faculty of Medicine,
Mazandaran University of Medical Sciences,
Sari, Iran.
Ph.No: +151-3543088, Fax: +151-3543087
E-mail: aref104@gmail.com

DOI : 10.5530/PTB.1.1.6

most common site. Tuberculous dactylitis may involve hands and feet especially in childrens.⁸ Poncet's disease is a form of reactive arthritis occurring during active TB and often involve hands and feet.⁹

The diagnosis of tuberculous arthritis is best made by histologic and microbiologic examination of synovium. Histology may demonstrate caseating or noncaseating granulomas. Tuberculous arthritis usually responds to combination chemotherapy. Surgery may be needed for synovectomy, debridement, joint stabilization, or removal of infected prostheses.^{1,6,8}

SUBJECTS AND METHODS

This retrospective study was performed at the TOOBA referral rheumatologic clinic of Mazandaran University of medical sciences during two years from January 2011 to December 2013. Ten patients with tuberculosis refer to clinic for musculoskeletal disorders during this period for evolution. Their medical history were retrieved from the hospital's medical records department and each patient examined by a rheumatologist and pulmonologist. Patients included in this study were 18 to 48 years old with tuberculosis that diagnosed by radiologic findings, PPD test and the definitive diagnosis is made by the demonstration of M.tuberculosis in tissue or synovial fluid. Cases with who any kind of traumatic or congenital musculoskeletal abnormalities and other inflammatory and infective disorders or incomplete data or unclear diagnosis were excluded. Spondylodiscitis or Potts disease confirmed by clinical findings and radiography of spine and confirmed by biopsy of tissue. Diagnosis of the vertebra collapse and stress fractures confirmed by physical examination and radiographic finding. Osteomyelitis, on the other hand was diagnosed as a relapsing and persistent infection that evolves over months to years characterized by low-grade inflammation, fever, presence of dead bone (sequestrum), new bone apposition, and fistulous tracts. Septic arthritis was diagnosed by aspiration of joint and culture of organism and in patients with negative culture, biopsy of synovial tissue or PCR of fluid were performed. Reactive arthritis of TB or poncet's disease were confirmed by presence of arthritis in joint without isolation of organism from the involved joint and presence of active disease in another site in the body. Dactylitis and tenosynovitis confirmed by clinical findings and imaginary studies including radiography and sonography of involved organ and confirmed by biopsy of tissue. Objective of this study was to determine the age, sex, kind and pattern of musculoskeletal complications of tuberculosis in these adult patients. Data were analyzed by using the SPSS version 20 soft-wares. Data were expressed as the mean \pm SD (range) or number (percentage). Means were compared using the Mann-Whitney rank sum test.

All probabilities were 2-sided, with P values less than 0.05 considered statistically significant.

RESULTS

A total of 10 patients with tuberculosis refer to our clinic for musculoskeletal disorders during 2 years from January 2011 to December 2013 for further evaluation. All of the patients were adults with ages between 18 to 48 years old (median: 30.8 years old). Seven of patients (70%) were males and three of them were female (30%). Table 1 depicts the demographic profile of the patients. The most common musculoskeletal finding was spondylodiscitis or pott's disease with painful axial pain specially in thoracolumbar region in six (60%) of cases. Most of patients were male (4 patients) and two cases was female. Stress fracture and vertebral collapse occurred in two patients that one of them was male and another one was female. Peripheral joint arthritis was diagnosed in five patient (50%) and the most common involved joints were knees that occurred in four patients and hip joint in one case. All of patients were male. Other musculoskeletal complications was osteomyelitis that occurs in 2 (20%) of patients that were female. One region of osteomyelitis was in 5th rib at the right side of the chest and another site was in the shaft of left hip. Reactive arthritis or poncet's disease occurred in 2 (20%) of patients that all of them were male. Saroilitis joint of right side and arthritis of small joint of hand was another side of involvement. Dactylitis occurred in one patient that occurs in third fingers of right hand. This patient was female and had spondylodiscitis concordantly. In another one (10%) of patients soft tissue abscess occurred that was in psoas muscle of left side. This patient had spondylodiscitis concordantly.

DISCUSSION

Musculoskeletal tuberculosis refers to tuberculous involvement of the bones, joints and musculature.¹⁰ Skeletal tuberculosis accounts for 10 to 35 percent of cases of extrapulmonary tuberculosis and almost 2 percent of all TB cases.¹¹ According the study of Malaviya AN et al, Most patients in tuberculous arthritis are middle-aged or older.⁷ In our study, the median age of patients was 30.8 (18-48) years old. In this study 10 patients with tuberculosis musculoskeletal disorders refers during 2 years from January 2011 to December 2013 for further evaluation.

According to study of Chapman M et al, the spine is the most common site of involvement in skeletal tuberculosis and accounting for approximately half of musculoskeletal TB cases.¹¹ According the study of Jellis JE et al, between 48% and 67% of lesions occur in the lower thoracic and thoracolumbar spine in HIV-negative patients, whereas the lumbar spine is most commonly involved in HIV-positive patients.¹² In our study, the most common site of involvement was spine that occurs in 6 (60%) of cases and the most common site of involvement was in lower thoracic region that occurred in 4 (40%) patients and in another two cases occurred in lumbar spine. All of patients were HIV negative.

Table 1: Characteristics of musculoskeletal disorders in 10 adult patients with tuberculosis

Case no	Age (years)	sex	Potts disease (spondylodiscitis)	Osteomyelitis	arthritis	dactylitis	Poncet's disease	Soft tissue abscess
1	18	M	+	-	-	-	-	+
2	26	M	-	-	+	-	-	-
3	19	F	+	+	-	-	-	-
4	33	M	-	-	+	-	+	-
5	42	F	+	-	-	+	-	-
6	29	M	+	-	+	-	-	-
7	30	M	-	-	+	-	-	-
8	28	F	-	+	-	-	-	-
9	48	M	+	-	-	-	+	-
10	35	M	+	-	+	-	-	-

The next most common form of musculoskeletal tuberculosis is monoarthritic arthritis.¹³

The typical pattern is arthritis that involves the large joints, most commonly the hip and knee.¹⁴ According the study of Evanchick CC et al, Of 23 cases of musculoskeletal TB, 9 involved the spine, 1 the hip, and the remaining 13 the peripheral joints. Most patients were men older than 50 years. In our study, 5 (50%) of patients had peripheral arthritis and most common joint was knee joint that involved in 4 patients and in another ones hip joint was involved.

Tuberculous osteomyelitis occurs in both children and adults and can be involves the long bones. Bone lesions begin with hematogenous implantation of organisms in the medullary area and lesions are typically destructive.¹⁵ The femur and the tibia are most commonly affected.¹⁶ In this study, osteomyelitis occurred in 2 (20%) patients and the site of involvement were in 5th rib at the right side of the chest and another site was in the shaft of left hip.

Other clinical manifestations of Musculoskeletal tuberculosis is soft tissue mass that can occurs as extraspinal soft tissue mass or as a psoas abscess.¹⁷ Formation of soft tissue mass or cold abscess is uncommon, although according of study of Polly P et al in South African series it was described in 16 of 98 cases.¹⁸ In our study one patients (10%) had soft tissue abscess. The most common sign of soft tissue mass are local pain associated with muscle spasm and rigidity with Constitutional symptoms such as fever and weight loss.¹⁹

Poncet disease or tuberculous reactive arthritis is an acute symmetrical polyarthritis that occurs with active extrapulmonary, pulmonary, or miliary TB. In general there is inflammation of the involved joints but no objective evidence of active TB infection.²⁰ Poncet disease is relatively rare and occurs in large and small joints and the pathogenesis is probably immune-mediated and the arthritis generally resolves within a few weeks of initiation of antituberculosis therapy.^{21,22}

REFERENCES

- Leonard MKJ, Blumberg HM. Musculoskeletal tuberculosis. In: Schlossberg D, ed. Tuberculosis & nontuberculous mycobacterial infections. 5th ed. New York: McGraw-Hill; 2006; 242–63.
- Martini M, Ouahes M. Bone and joint tuberculosis: a review of 652 cases. *Orthopedics* 1988; 11(6): 861–6.
- Cormican L, Hammal R, Messenger J, Milburn HJ. Current diffi culties in the diagnosis and management of spinal tuberculosis. *Postgrad Med J* 2006; 82(963): 46–51.
- Ridley N, Shaikh MI, Remedios D, Mitchell R. Radiology of skeletal tuberculosis. *Orthopedics* 1998; 21(11): 1213–20.
- Perronne C, Saba J, Behloul Z, et al. Pyogenic and tuberculous spondylodiskitis (vertebral osteomyelitis) in 80 adult patients. *Clin Infect Dis* 1994; 19(4): 746–50.
- Garrido G, Gomez-Reino JJ, Fernandez-Dapica P, Palenque E, Prieto S. A review of peripheral tuberculous arthritis. *Semin Arthritis Rheum* 1988; 18(2): 142–9.
- Malaviya AN, Kotwal PP. Arthritis associated with tuberculosis. *Best Pract Res Clin Rheumatol.* 2003; 17(2): 319–43.
- Dall L, Long L, Stanford J. Poncet's disease: tuberculous rheumatism. *Rev Infect Dis.* 1989; 11(1): 105–7.
- Daniel TM, Bates JH, Downes KA. History of tuberculosis. In: Tuberculosis: Pathogenesis, Protection, and Control, Bloom BR (Ed), American Society for Microbiology, Washington; 1994. p. 13.
- Watts HG, Lifeso RM. Tuberculosis of bones and joints. *J Bone Joint Surg Am.* 1996; 78(2): 288.
- Chapman M, Murray RO, Stoker DJ. Tuberculosis of the bones and joints. *Semin Roentgenol* 1979; 14(4): 266–82.
- Jellis JE. Human immunodeficiency virus and osteoarticular tuberculosis. *Clin Orthop Relat Res.* 2002; 398(3): 27–31.
- Vohra R, Kang HS, Dogra S, et al. Tuberculous osteomyelitis. *J Bone Joint Surg Br.* 1997; 79(4): 562.
- Babhulkar S, Pande S. Tuberculosis of the hip, *Clin Orthop Relat Res.* 2002; 398(1): 93–9.
- Tsay MH, Chen MC, Jaung GY, et al. Atypical skeletal tuberculosis mimicking tumor metastases: report of a case. *J Formos Med Assoc.* 1995; 94(7): 428–31.
- Shih HN, Hsu RW, Lin TY. Tuberculosis of the long bone in children. *Clin Orthop Relat Res.* 1997; 335(1): 246–52.
- Girdlestone GR, Somerville EW. Tuberculosis of Bone and Joint, 2nd ed, Oxford University Press, London; 1952.
- Polley P, Dunn R. Noncontiguous spinal tuberculosis: incidence and management. *Eur Spine J.* 2009; 18(8): 1096.
- Hodgson SP, Ormerod LP. Ten-year experience of bone and joint tuberculosis in Blackburn 1978–1987. *J R Coll Surg Edinb* 1990; 35(4): 259.
- Isaacs AJ, Sturrock RD. Poncet's disease--fact or fiction? A re-appraisal of tuberculous rheumatism. *Tubercle* 1974; 55(2): 135.
- Sood R, Wali JP, Handa R. Poncet's disease in a north Indian hospital. *Trop Doct.* 1999; 29(1): 33.
- Babhulkar SS, Pande SK. Unusual manifestations of osteoarticular tuberculosis. *Clin Orthop Relat Res.* 2002; 398:114–120.
- Evanchick CC, Davis DE, Harrington TM. Tuberculosis of peripheral joints: an often missed diagnosis. *J Rheumatol.* 1986; 13(1): 187–9.

According study of Evanchick CC et al, dactylitis may also occur in children and represented 19% of bone and joint TB and 15% of cases of osteomyelitis of hematogenous origin.²³ In this stud , two (20%) patients had poncet,s disease that occurred in Saroilitis joint of right side and arthritis of small joint of hand was another side of involvement.

The reason for variations at different studies could be due to difference of age of cases, geographical and sample size.

CONCLUSION

The most common musculoskeletal complications in adults with tuberculosis are insidious onset of spondylodiscitis that commonly occurred in thoracolumbar resion of spine and peripheral joint arthritis that commonly occurred in lower weight bearing joint and especially in knee joint. Other complications including osteomyelitis, dactylitis and reactive arthritis or poncet's disease. In comparison with another studies of adult patients with tuberculosis, the spinal involvement was similar at thoracolumbar region involvement. In other study, the hip joint was involved more frequently but at this study knee joint involved more frequently. Other findings were similar to another studies. The small sample size and inability to explore other risk factors also limited this work and its generalizability.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

ACKNOWLEDGEMENTS

The researchers would like to appreciate cooperation of the honorable staff of Infectious diseases department of Razi Hospital of Ghaemshahr and Imam Hospital of Sari.