

Tanaffos (2002) 1(3), 45-49

©2002 NRITLD, National Research Institute of Tuberculosis and Lung Disease, Iran

Tuberculosis of the Spine in Children

Soheila Khalilzadeh¹, Soheila Zahirifard², Ali Akbar Velayati¹

¹ Department of Pediatrics, ² Department of Radiology, NRITLD, Shaheed Beheshti University of Medical Sciences and Health Services, TEHRAN -IRAN

ABSTRACT

Background: Tuberculous spondylitis or Pott's disease results in characteristic deformity. In developed countries, Pott's disease occurs primarily in older adult rather than children. In developing countries where the infection rate is high, it occurs mainly among children.

Materials and Methods: We have reviewed the hospital records of pediatrics ward with diagnosis of tuberculosis between 1995 and 2001.

Results: There were seven children with the diagnosis of Pott's disease. The age of the patients ranged from 7 to 14 years with mean of 11.14 years. All of them were Afghans. In four cases, spine was the main affected site, in two patients disseminated tuberculosis was seen; and in 1 case, spinal involvement was associated with pulmonary tuberculosis. Of them, five patients had paraspinal abscess. Fistula was formed in the lumbar region of 2 patients. Abscess discharge was AFB smear positive only in one case. The most common involved vertebral bodies were T12 and L1; however, thoracic and lumbar vertebrae from T12 to L4 were affected. In 4 cases, spondylitis resulted in kyphosis and in two patients, spinal cord compression was detected by imaging techniques. Pott's paraplegia was seen in one patient. All patients were treated according to DOTS strategy, and one underwent surgical drainage of abscess. After termination of initial phase and relative improvement of signs and symptoms, 5 cases were referred for surgical management and subsequently maintenance treatment was continued for 10 months.

Conclusion: We suggest that in the endemic countries for tuberculosis, Pott's disease in children must be taken into consideration. Imaging techniques are also valuable means for confirmation of diagnosis. (*Tanaffos* 2002; 1(3): 45-49)

Key words: Pott's disease, Kyphosis, Children, Tuberculous spondylitis.

INTRODUCTION

Tuberculous spondylitis or Pott's disease results in spinal deformity, mostly kyphosis. The disease was first described by Sir Deraval Pott in 1779. Although the prevalence of all forms of TB declined in the industrialized countries, this disease is still highly prevalent in developing countries. Various forms of

extrapulmonary tuberculosis in children are still seen in some areas (1).

Although tuberculous spondylitis is mainly seen in adults, in developing countries with high prevalence of TB, Pott's disease as well as its complications is still reported among children (2,3).

In a study performed in Senegal, 27 children with Pott's disease were reported. Their age ranged from 2 to 15 years. In this part of the world, Pott's disease

Correspondence to: Khalilzadeh S.

Tel: +98-21-2803550 Fax: +98-21-2285777

E-mail address: skhalilzadeh@nritld.ac.ir

has been recognized as the most common etiology for spinal cord compression (4).

In another report from Russia, 32 children under the age of 16 had Pott's disease. Among whom, Pott's paraplegia was seen in 8 cases. At least three lumbar vertebrae were affected at the same time (5).

In this study, children with the diagnosis of tuberculosis admitted to Masih Daneshvari hospital from 1995 to 2001 were evaluated.

MATERIALS AND METHODS

Hospital records of children with tuberculosis who admitted to Masih Daneshvari hospital from 1995 to 2001 were reviewed in this descriptive study. Tuberculosis diagnosis was confirmed by a combination of clinical and paraclinical findings. Laboratory examinations included: CBC, ESR, PPD, smear and culture of gastric lavage and abscess discharge for AFB, chest X-ray and CT-scan, abdominal CT-scan, spinal X-rays, and spinal MRI (if needed).

Meanwhile at least three of the following criteria were necessary for diagnosis: physical examination compatible with TB, positive bacteriologic studies, history of close contact, positive PPD test result, and radiological manifestations of TB.

RESULTS

During a period of six years, seven medical records with diagnosis of tuberculous spondylitis were found. The patients included 4 boys and 3 girls. Their age ranged from 7 to 14 with the mean of 11.14 years. The history of close contact was positive in three cases. The interval between the onset of symptoms and diagnosis ranged from 1 to 8 years. The chief complaints of the patients were lumbar pain, as well as fever, malaise, weight loss, and diaphoresis.

Six patients were under the 5th percentile of length and weight by age curve and one patient was keeping pace with the 10th percentile curve.

Tuberculin test results were positive in 6 patients with an induration diameter ranged from 8 to 32 mm with mean diameter of 14.71mm.

Three consecutive gastric lavage samples of patients were sent for mycobacteriologic studies, where in one child the culture was positive.

Of 7 cases, 5 had paraspinal abscess. Fistula was formed in lumbar region as a complication of abscess in two of them. Direct smear examination of abscess discharge was positive for AFB in one patient.

In four cases, spine was the main affected site, in two patients disseminated tuberculosis was seen and in one case, spinal involvement was associated with pulmonary tuberculosis.

Thoracic and lumbar vertebrae from T12 to L4 were affected. T12 and L1 vertebral bodies were involved in three patients (Figure 1).

Fig 1. CT-scan revealed vertebral body destruction

In four cases, spinal infection resulted in variable degrees of kyphosis (Figure 2,3). MRI in two cases revealed cord compression.

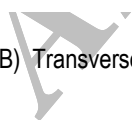
reported that lungs are simultaneously involved in 50% of tuberculous spondylitis patients. In our study three of seven cases had pulmonary involvement. Moreover, the anterior surface of the vertebral body is most commonly infected. Tuberculosis infection may spread to adjacent intervertebral discs from the anterior surface of the vertebral body. In childhood period the intervertebral disc is vascularized; therefore, the tuberculous spondylodiscitis among children may be resulted from primary infection, while as the disc is avascular in adults, disc disease is due to contagious spread of infection from the vertebral body in them. Collapse of the vertebral end plate causes narrowing of the intervertebral disc space. Gross kyphotic deformities due to collapse of the anterior surface of vertebral body are formed in neglected cases.

Back pain and rigidity of the back are the earliest symptoms that may result in paraparesis and paraplegia in progressive cases (1,6,7). The minimum interval between diagnosis and onset of symptoms is usually one year. However, in the present study, this period varied from 1 to 8 years, which was mainly due to the patient's delay.

Reactivation of primary tuberculosis infection usually occurs during the adolescence period. In our study the children's age ranged from 7 to 14 years which is similar to other reports (7).

Six patients were under the 5th percentile of growth curve, which indicated severe malnutrition. Therefore, immunodeficiency due to malnutrition is thought to be the main reason for reactivation. According to the various reports, more than one vertebra is involved in Pott's disease (6,8). In our study, five children had at least two involved vertebral bodies. The most common complication of spondylitis is paraplegia that occurs as a result of cord compression due to abscess, granulation tissue, sequestra formation in vertebral body, or direct dural

Fig 2. (A) Coronal (B) Transverse CT-scan showed severe kyphosis



DISCUSSION

Infection of spine by *M.tuberculosis* is felt to develop following hematogenous spreading from primary site of infection. Sometimes; however, *M.tuberculosis* bacilli may spread via lymphatic vessels from the other area (i.e.: spine involvement via periaortic lymph nodes). Different studies

involvement (9,10). Cord compression was seen in two of our patients. Spinal infection among children is usually accompanied by paraspinal abscess, which holds a number of bacilli less than that seen in pulmonary tuberculosis (6,11). Paraspinal abscess was detected in 5 cases, while only in one patient the smear of abscess discharge was AFB positive.

Diagnosis by microscopic means is hindered by the small number of bacilli present in spinal lesions; thus, utilization of other diagnostic methods (i.e.: radiography, MRI) is recommended (12,13).

The anterior surface of vertebral body is most commonly infected; however, collapse of this region usually results in kyphosis. Some degree of kyphosis was seen in 4 cases. Severe kyphosis was seen in a child with three involved vertebrae. Anti-tuberculosis treatment according to DOTS (Directly Observed Treatment, Short-Course) strategy was planned for all patients. Abscess drainage was performed in one patient. After termination of intensive phase of treatment and relative improvement of signs and symptoms, five cases referred for surgical management. All the patients took anti-TB drugs for one year. In this period the clinical status as well as paraclinical tests were evaluated monthly.

In this study, Pott's disease was not seen in Iranian patients and all of the cases were Afghan refugees.

Immigration, malnutrition and unavailability of proper health care along with high incidence of tuberculosis in Afghanistan causes children's suffer. The consequence of all the aforementioned problems had been reactivation of tuberculosis and spondylitis in adolescence period; therefore, these patients acquired mild to severe degrees of Pott's disease.

According to the results of this study, in countries with high prevalence of tuberculosis, Pott's disease must be taken into consideration in childhood period. Imaging techniques as well as other diagnostic criteria could be helpful for confirmation of diagnosis.

REFERENCES

1. Sternbach G. Percivall Pott: Tuberculosis spondylitis. *J Emerg Med* 1996; 14(1): 79-83.
2. Montero E, Caso F, Asquasciati G, et al. Tuberculosis of the spine in children. *Minerva Pediatric* 1994; 46(6): 295-301.
3. Campos P, Chaparro E, Valenca F, et al. Pott's disease in children. *Arq Neuropsiquiatr* 1989; 47(3): 303-7.
4. Ndiaye M, Sene-Diouf F, Diop AG, et al. Pott's spinal cord compression in the child. *Dakar Med* 1999; 44(1): 49-53.
5. Mushikin AY, Kovalenko KN. Neurological complications of spinal tuberculosis in children. *Int Orthop* 1999; 23(4): 210-2.
6. Davidson PT, Quos Le H. Musculoskeletal tuberculosis. *Tuberculosis and nontuberculosis mycobacterial infection*. 4th ed. 1999.p. 204-17
7. Boachie-Adjei O, Squillante RG. Tuberculosis of the spine. *Orthop Clin North Am* 1996; 27(1): 95-103.
8. Tuli SM. Severe kyphotic deformity in tuberculosis of the spine. *Int Orthop* 1995; 19(5): 327-31.
9. Journeau P, Koura A, Mary P. Pott's disease paraplegia in children. Mechanics and therapeutic strategies. Six case. *Rev Chir Orthop Peparatrice Appar Mot* 1999; 85(2): 117-24.
10. Desia SS. Early diagnosis of spinal tuberculosis by MRI. *J Bone Joint Surg Br* 1994; 76(6): 863-9.
11. Mosheiff R, Meyer S, Floman Y, et al. Anterior vascularized rib strut graft in the treatment of Pott's disease in the young child. *Bull Hosp Jt Dis* 1993; 53(1): 61-5.
12. Rothman SL. The diagnosis of infections of the spine by modern imaging techniques. *Orthop Clin North Am* 1996;27(1): 15-31.
13. Medical Research council: working party on tuberculosis of the spine: controlled trial of short-course regimens of chemotherapy in the ambulatory treatment of spinal tuberculosis: results at three years of a study in Korea. *J Bone Joint Surg Br*1993; 75(2): 240-8.