Neurology Asia 2010; 15(3) : 239 – 244

Spinal tuberculosis in adults: A study of 87 cases in Northwestern Nigeria

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Abstract

Background: Tuberculosis was a leading cause of mortality in the beginning of the twentieth century. However, it continues to be a major public health problem in developing countries. This study aimed to evaluate the clinical and radiological profile of tuberculosis of the spine in northern Nigeria. *Methods:* Eighty seven patients with tuberculosis of the spine were studied for 4 years, the patients were recruited from in and outpatient Neurology Clinic of Aminu Kano Teaching Hospital, and Murtala Muhammed specialist Hospital (MMSH), Kano. Clinico-radiologic evaluation was carried out. *Results:* 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 finding on spinal X-ray.
Conclusion: Tuberculosis of the spine is a common cause of morbidity in Northwestern Nigeria. Thus, there is increasing need to improve on the prevention of this disabling disorder.

INTRODUCTION

Tuberculosis of the spine is one of the oldest diseases afflicting humans.[1] Tuberculosis was a leading cause of mortality in the beginning of the twentieth century. Improvement in the socio-economic status led to a major decline in the prevalence even before the introduction of antituberculous drugs. However, it continues to be a major public health problem in developing countries. Malnutrition, poor sanitation are the factors contributing to the spread of the disease. Spinal Tuberculosis (Pott's disease, tuberculous spondylitis) constitutes a significant health burden in developing countries. It is adjudged to be one of the major causes of morbidity in Nigeria.[2] Paraplegia due to this non-traumatic myelopathy is a disabling and distressing neurological disorder. Spinal Tuberculosis is said to occur in about 1-2% of patients with tuberculosis.[3-5] Skeletal involvement has been reported to occur in approximately 10% of all patients with extrapulmonary tuberculosis, and half of these patients develop infection within the spinal column.[6,7] In other words, topographically, spinal tuberculosis constitutes about half the cases of skeletal tuberculosis.[6] It results from an infection of the spinal bone by *Mycobacterium tuberculosis* bacteria via haematogenous and or lymphatic spread. This organism may remain dormant in the skeletal system for a long period of time before the disease can be detected. It may involve the paravertebral soft tissues, the vertebral body, epidural space and the interverebral discs. Studies of tuberculous spondylitis from developing and tropical countries like Nigeria are relatively few and the majority of studies on paraplegia from Nigeria have been carried out in the pre-magnetic resonance imaging era.[2,8] This study aimed to evaluate the clinical and radiological profile of tuberculosis of the spine in northern Nigeria where relatively few data are available on this disorder.

METHODS

Eighty seven patients with tuberculosis of the spine were studied for 4 years (May 2005-May 2009). Patients were recruited from cases admitted into the ward or managed in outpatient Neurology

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Clinic of Aminu Kano Teaching Hospital (which has a wide coverage of states in the northern Nigeria), Murtala Specialist Hospital Kano and two other peripheral hospitals over this period of 4 years were studied. The first two years of the study was retrospective while the last two years was prospective. Diagnosis was based on clinical features including the presence of paraplegia or paraparesis with or without back pain, band-like sensation, paraesthesia, fever, weight loss, night sweat with or without cough and gibbus, and typical spinal x-ray features including disc space narrowing, u-shaped lesions, wedge collapse of vertebra, vertebra planar, appendicular lesions, paraspinal abscess and total destruction of vertebral body [9] as well as positive MRI as reported by the radiologists. Microbiological confirmation of tuberculosis could not be done due to lack of facilities. However, cautious clinicoradiological efforts were made to exclude other differentials. In those that had paravertebral and psoas abscesses, culture for pyogenic organisms were done to exclude pyogenic cause. Information over the first 2 years was obtained from the Medical Record Departments of these hospitals. Information were also gathered from consecutive patients in the last 2 years of the study; radiographs and neuroimmaging to determine the vertebra involved, the presence of paresis or paraplegia, associated pulmonary tuberculosis, the presenting features as well as follow up of the patients were all documented, analyzed and interpreted.

RESULTS

Eighty seven patients were recruited during the study period. 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 years. Farmers were mostly affected as they accounted for 23% of all the patients (Table 1). The commonest age group was between 30 to 40 years (40.2%) while the least between 40 and 50 years (4.6%) (Table 2). Seventy five percent of the patients presented more than 2 months after the onset of the illness. Paraplegia/paraparesis and sensory impairment over the lower limbs were the most common features (100%) followed by back pain (90.8%). Nine (13.4%) patients had cauda equina syndrome and 3 (3.4%) had cold psoas abscess. Ten (11.5%) of the studied patients had been treated for pulmonary tuberculosis in the past, 10 (11.5%) patients had concomitant pulmonary TB. Fifty eight (66.7%) patient had paraplegia while the remainder had paraparesis (power > 0) (Table 3). All the patients had plain spinal radiographs, 20 (23%) patients had normal finding on spinal X-ray. Predominantly, 10 (11.5%) subjects had kissing lesion, 44 (50%) had wedge collapse, planar vertebra was in 10 (11.5%) patients, 18 (20.7%) patients had complete destruction and 9 (10.3%) had paravertebral shadow. The vertebral levels most commonly affected mostly were lower thoracic (T6-T12) and upper lumbar (L1-L3) segments, accounting for 43% and 28 % respectively (Table 4). Sixteen subjects had magnetic resonance imaging (MRI). There was abnormal finding (extrinsic or extradural) in all of them. Sixty seven (77%) had Mantoux test out of which 58 (66.7%) was abnormal. Risk factors identified in these patients were human immunodeficiency virus (HIV) in 15 (17.2%) patients, 4 (4.6%) patients were on chronic steroid use and 2 (2.3%) were on cytotoxic drugs. Forty nine of these patients were managed by admission, 40 (81.6%) stayed for 1-2 months and the remainder (18.4%)

Table 1: Distribution of patients by occupation

Occupation	Frequency	Percent
Farmers	20	23.2
Civil servant	15	17.2
Housewife	15	17.2
Student	13	14.9
Trader	13	14.9
Unemployed	11	12.6
Total	87	100

Table 2: Distribution of patients by age group

Age group	Frequency	Percent
10-20 years	9	10.4
21-30 years	11	12.6
31-41 years	35	40.3
41-50 years	4	4.6
51-60 years	19	21.8
61-70 years	9	10.3
Total	87	100

stayed for 2-3 months before discharge. All the patients were treated with rifampicin, isoniazid, pyrazinamide and ethambutol for a minimum of 8 months. Thirty eight (43.7%) patients had bed sores. Sixty seven patients were followed up for over 6 months, 20 (30%) had no disability, 20 (30%) had minor disability and 27 (40%) had major disability.

DISCUSSION

Tuberculosis of the spine is one of the oldest diseases afflicting humans. Evidences of spinal tuberculosis have been found in Egyptian mummies dating back to 3400 BC.[1] However, it continues to be a major public health problem in developing countries. Tuberculosis of the spine is a major cause of non-traumatic paraplegia in developing countries; this condition is associated with significant morbidity and attendant socio-economic repercussions.

In this study, the diagnosis of spinal tuberculosis was based on clinical and radiological findings, microbiological test for tuberculosis was however, not done due lack of facilities. Nevertheless, inclusion of MRI in the diagnostic evaluation is an added advantage over the previous studies

Table 3: Clinical features of the patients with spinal tuberculosis

Clinical features	Frequency	Percent
Back pain	79	90.8
Paraplegia/paraparesis	87	100
Sphincteric disturbance (Urinary and or faecal)	76	87.4
Radicular pain	68	78.2
Subjective loss of sensation	55	63.2
Objective sensory impairment	87	100
Erectile dysfunction	46	80.7
Cough	20	23
Fever	40	46
Weight loss	18	20.7
Back swelling (gibbus)	29	33.3
Treatment for pulmonary TB in the past	10	11.5
Current treatment for pulmonary TB	10	11.5

*80.7 % of male patients.

Table 4: Distribution of level of abnormality on spinal radiograph and MRI

T3-T6	10	13.4
T6-T12	29	43.3
L1-L3	19	28.4
L3-S5	9	13.4
Total	67	100

on Pott's disease in Nigeria[3,4,8,9] as it improve diagnostic yield and accuracy. We belief that inadvertent inclusion of metastatic disease or pyogenic bacterial infection is unlikely.

The male preponderance of 66% possibly portrays differential sex hospital attendance pattern in the region of the study as women often require consents of their husbands to go to the hospital, and this finding is in keeping with the findings in some other previous studies.[10-14] However, in some other series, the disease has been found to affect males and females in equal proportions.[10-13] A few studies have also documented female preponderance.[3] In our study, the patients that were most commonly affected belong to the working class which, hence, had a great economic impact on the society. This finding is in agreement with the finding of Njoku *et al* in Sokoto, Nigeria[3], but it is at variance with that of Sholagberu *et al* and Ikem *et al's* studies, also in Nigeria, in which children were included.[10,11]

Seventy five percent of the patients presented more than 2 months after the onset of the illness and the majority of the subjects were paraplegic (66.7 %). The large number of paraplegic and the delay before seeking healthcare in this study may be partly related to the low level of education and health care in the catchments area of study, resulting in undue waiting until they patients can could no longer cope with their daily activities before they presented to the hospital. The reported average duration of symptoms at diagnosis varies and it can be as long as 4 months[15] or considerably longer, even in the most recent series.[16,17] This has been ascribed to the nonspecific presentation of chronic back pain. In this study, most of the patients were farmers, full time housewives and civil servants, the majority of whom belong to low socio- economic class. Many of these patients would have consulted the traditional healers before seeking orthodox medical attention.

Paraplegia or paraparesis and sensory impairment over the lower limbs were the most common features (100%) followed by back pain (90.8%), weakness and sensory impairment of the lower limbs possibly because they are generally considered as the ominous and most dreaded of all the manifestations in our environment. On the whole, significant motor affectation of the lower limbs is a serious manifestation of spinal tuberculosis in third world countries where diagnosis of the disease is delayed due to ignorance on the side of the patients, lack of the appropriate equipment to make early diagnosis and the insidious nature of the onset of the disease.[18] Back pain as one of the commonest symptoms in this study is in agreement with the findings in earlier studies.[3,10,11] Njoku *et al* found back pain as the commonest presenting feature, accounting for 77.2% in their study.[3] Paraplegia and inability to walk was found in 40% and 46% of the patients of Obajimi *et al*[4]; however, the study was carried out on patients with tuberculosis of the spine referred for computerized tomography of the spine.

The commonest temporal profile in these cases was that of an extradural lesion with symptoms in the majority (86.2%) started as back pain followed by weakness and then sphincteric disturbance in that order.

Fever and weight loss were found in only 46% and 20.7% of the patients respectively, a similar finding was seen in Sokoto's study.[3] Of note is the large proportion (80.7%) of male subjects with erectile dysfunction. This is often the most incapacitating manifestation because of the social stigma attached in our environment.

Only 11.5 % of the studied patients were on treatment for pulmonary tuberculosis or were previously treated for tuberculosis. Pulmonary tuberculosis simultaneously occurring with spinal tuberculosis is well documented. Tuberculosis affecting the central nervous system, in this case the spinal cord, has frequently been secondary to tuberculosis in the lungs.[19] However, our results was similar to a study by Sholagberu *et al* across all age groups in Ilorin, Nigeria, where only 11.1% of the 27 patients studied had pulmonary tuberculosis[10].

Gibbus or angular kyphosis was seen one third (33.3%) of the patients in this study and all were in the thoracic region. In the lumbar region, normal lordosis prevents the tendency of anterior disease of the spine to cause kyphosis, so extensive destruction of a vertebral body is required before kyphosis occurs. Thus, cosmetic deformity is less common in this region of the spine compared to the thoracic spine.

Immunosuppressive risk factors identified in these patients were HIV in 15 (17.2%) patients, 4 (4.6%) patients were on chronic steroid use and 2 (2.3%) were on cytotoxic drugs. Earlier study has shown that the clinical presentation of spinal tuberculosis in patients infected with the HIV is similar to that of patients who are HIV negative.[20] However, spinal tuberculosis seems to be more common in persons infected with HIV.

Spinal radiography remains the cornerstone for imaging techniques for spinal TB as it provides most of the information necessary for diagnosis and treatment.[10] However, radiographic findings and signs are typically far advanced when the diagnosis is finally established.[7] In this study, the vertebral levels affected mostly were lower thoracic (T6-T12) and upper lumbar (L1-L3). Some studies have also found the thoracic spine predominantly affected.[4,13,21,22] The frequencies of affectation of the thoracic and lumbar spines were equal in certain studies[3] while others have found the lumbar spine to be more frequently affected.[11,12] This finding is also in line with the study of Oshinaike's and Lagundoye's in Ibadan.[9] In this study, no case of cervical tuberculosis was seen.

Sixteen subjects had magnetic resonance imaging (MRI), there was abnormal finding (extrinsic or extradural) in all of them. In our environment, as in some other developing countries, MRI is expensive and difficult to access, it is therefore often reserved for cases where findings on spinal radiography were non-specific.

In this study, 49 patients were managed by admission, 40 (81.6%) stayed for 1-2 months and the remaining patients (18.4%) for 2-3 months. Sixty seven patients were followed up for over 6 months, (30%) had no disability, 20 (30%) had minor disability and 27 (40%) had major disability.

In conclusion, tuberculosis of the spine is a common spinal disorder in northwestern Nigeria. Thus, there is increasing need to improve the prevention of this disabling disorder. The measures should include immunization of the "at risk" group, improved nutrition as well as health education of the populace. Low threshold for diagnosis of spinal tuberculosis is also of importance. Successful management of spinal tuberculosis also requires team work involving the Physician, Radiologist, Orthopaedic Surgeon and Neurosurgeon to ensure early diagnosis and treatment.

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