



## Management of Musculoskeletal Tuberculosis in Enugu, Nigeria

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### Abstract

**Introduction:** Tuberculosis (TB) remains the most common cause of death from infectious disease worldwide. Musculoskeletal TB accounts for about 10-15% of all TB notification in non-industrialized world. The spine is the most common site for osseous involvement, accounting for about 50% of cases. There is little or no data on the epidemiology of musculoskeletal TB in South-Eastern Nigeria. The general aim of the study is to determine the epidemiologic pattern and treatment outcome of musculoskeletal TB in Enugu, south-Eastern Nigeria.

**Material and method:** The study is a retrospective study over a ten year period. The case notes of all the patients diagnosed and treated for musculoskeletal TB were retrieved and those who met the inclusion criteria were analyzed.

**Results:** A total of 104 patients' case notes were retrieved but 97 patients' case notes that met the inclusion criteria was analyzed. The incidence of musculoskeletal tuberculosis in Enugu is 1 in 250. 45.4% were males and 54.6% were females. Most of the patients presented with low back pain (61%) and inability to walk (14.4%). Spinal lesions account for 65% of cases. 86.6% of the patients had relative lymphocytosis while Mantoux test was positive in 82.5% of subjects. 82.5% had elevated ESR at diagnosis. These fell significantly at completion of anti TB drugs with 83% resulting in either complete resolution of symptoms or marked improvement of symptoms. Drugs were given for 8 months in 95% while 5% were extended for 12 months.

**Conclusion:** Use of anti TB drugs is still the cornerstone in the management of the disease. Diagnosis is possible with simple clinical, radiological and laboratory evaluation. Once diagnosis is made patient should be immediately commenced on the first line anti TB drugs. ESR, lymphocyte count and clinical evaluation of symptoms can be used to monitor treatment successfully. We recommend high index of suspicion among physicians in developing countries for prompt diagnosis and adequate treatment of musculoskeletal TB especially that of the spine.

**Keywords:** Enugu; Musculoskeletal; Nigeria; Tuberculosis

### Introduction

Tuberculosis (TB) remains the most common cause of death from infectious disease world-wide [1]. The World Health Organization (WHO) estimates there were 8.8 million new cases of TB in 2003, equating to 140 per 100,000 population and annual deaths are reported to reach 3 million [2]. Musculoskeletal tuberculosis accounts for about 10-15% of all TB notifications in the non-industrialized world [3]. However, in the western world, musculoskeletal TB tends to be uncommon and accounts for about only 1-2% of all case of TB and about 10-15% of extra-pulmonary TB [4]. The spine in the most common site for osseous involvement, accounting for about 50% of cases [5], followed by the pelvis (12%), hip and femur (10%), knee and tibia (10%), ribs (7%) and multiple site (3%) [6]. The diagnosis of extra pulmonary tuberculosis is often challenging and can be delayed [7]. A positive chest radiograph or positive skin tuberculin test will support the diagnosis though it is not excluded by negative result [8-10]. Concomitant pulmonary TB has been reported to be present in less than 30% of extra pulmonary TB cases [11]. Skeletal involvement is usually secondary, with the primary lesion occurring in the chest or genitourinary system [11]. Previously pulmonary involvement has been reported to be undetectable in about half of the cases [12]. In 1993, the WHO declared TB a global emergency as it continues to claim up to 3 million lives per annum [3]. Over 90% of cases of TB cases are found in the non-industrialized world [3]. There has been re-emergence of TB in industrialized world [1]. The resurgence of TB incidence in developed countries has been attributed to a rise in immune suppressed patients (HIV epidemic), multidrug resistant strains of *Mycobacterium species*, an ageing population, increased healthcare worker exposure and immigration [6-10]. It has also been shown that clinical presentation of TB varies with ethnicity [13]. Many children with TB will present

with musculoskeletal disease [11]. Most common site is the spine [7,11]. Vascularity, coupled with the scarcity of phagocytic cells in the spine make it a favourable environment for TB [14]. The diagnosis of musculoskeletal TB remains a challenge to clinicians and requires a high index of suspicion [7]. Typical radiographic pattern of bony involvement aid in diagnosis of TB but radiographs alone are never diagnostic [11]. It's important to confirm diagnosis and subsequently institute surgical and chemotherapeutic management [7]. Prompt diagnosis and treatment of skeletal TB are important to prevent serious bone and joint destruction and neurological compromise in spinal TB [7]. Management should be undertaken jointly by orthopaedic surgeons and respiratory physicians [7]. The most important aspect of treatment is a correct course of anti-tuberculosis drugs [11]. The recommended first line anti-tuberculosis drugs include Isoniazide, Rifampicin, Pyrazinamide and Ethambutol. The treatment of TB is curative regardless of anatomic site (so long as the organism remains sensitive to drug therapy) though outcome will depend on compliance with the prescribed treatment regimens [15]. Sometime, there is need for surgery. Indications for operation on the spine include unstable or

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progressive kyphosis and /or neurologic compromise in the presence of adequate medical therapy [11]. TB of appendicular skeleton is often adequately managed by drugs and splinting to maintain a position of function and an adequate range of motion of the joint [11]. Synovectomy, osteotomy or arthrodesis are sometimes indicated as an adjunct to drug treatment of TB in appendicular skeleton [11]. But in the overall, treatment is individualized and the anti TB drugs are given between 8-12 months duration.

The general aim of this study is to evaluate the epidemiologic pattern and treatment outcome of musculoskeletal TB at National Orthopaedic Hospital, Enugu. This is important since there is paucity of data on the subject in our environment. It is also necessary for scientific elucidation. The study will also help to determine complications that are commonly associated with musculoskeletal TB in our environment.

Enugu is the capital city of Enugu state of the Federal Republic of Nigeria. It is one of the 5 states within the south-Eastern geopolitical

Range	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
Freq	7	13	20	17	20	16	2	1
%	7.3	13.5	20.8	17.7	20.8	16.6	2.0	1.0

Table 1: Age distribution.

c/o	Freq	%
Low back pain	61	57.7
Inability to walk	15	14.4
Fever	1	1.0
Weakness both lower limb	2	2.0
Discharging sinuses	3	2.9
Swellings	8	7.7
Chronic ulcer	1	1.0
Bilateral knee pain	2	2.0
Deformity at the back	5	4.8

Table 2: Presenting complaint.

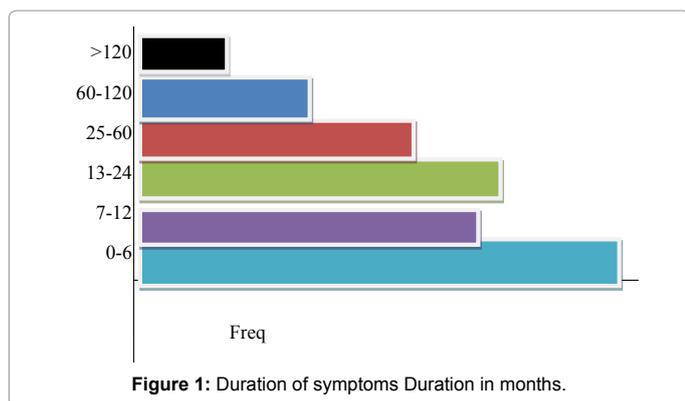


Figure 1: Duration of symptoms Duration in months.

ESR (mm1 <sup>st</sup> hr)	Freq	%
<20	17	17.5
21-40	12	12.4
>40	68	70.1

Table 3: ESR at diagnosis.

ESR (mm1 <sup>st</sup> hr)	Freq	%
<20	81	83.5
21-40	12	12.4
>40	4	4.1

Table 4: ESR at successful completion of anti TB drugs.

zone of the country. National Orthopaedic Hospital is a regional level I Orthopaedic hospital serving more than 11 states of the nation including the federal capital territory. It is a 220 bedded hospital located within Enugu metropolis.

## Materials and Method

The study is a retrospective study over a 10 year period from Jan 1998 to Dec 2009 conducted at National Orthopaedic Hospital Enugu. The case notes of all the patients diagnosed and treated for musculoskeletal TB were retrieved and reviewed. Information on patients' bio data, presenting complaint, duration of symptoms, X-ray findings, white blood cell count (WBC) with differentials, erythrocyte sedimentation rate (ESR), mantoux test, histology, treatment offered, treatment outcome and follow-up were retrieved and analyzed. The outcome measures used included complete resolution or improvement of symptoms or otherwise and serial changes in WBC and ESR laboratory results. The results were presented in texts, tables, figures and graphs. The inclusion criteria were all patients diagnosed and treated for musculoskeletal TB with complete relevant data as stated above. The exclusion criteria were those with incomplete data.

## Results

The age distribution of the patients is as shown in Table 1. A total of 97 patients' case notes were analyzed out of which 44 (45.45%) and 53 (54.6%) were males and females respectively. The presenting complaints are as shown in Table 2. Majority of the patients (70.2%) presented within 24 months of the onset of their symptoms as shown in Figure 1 below.

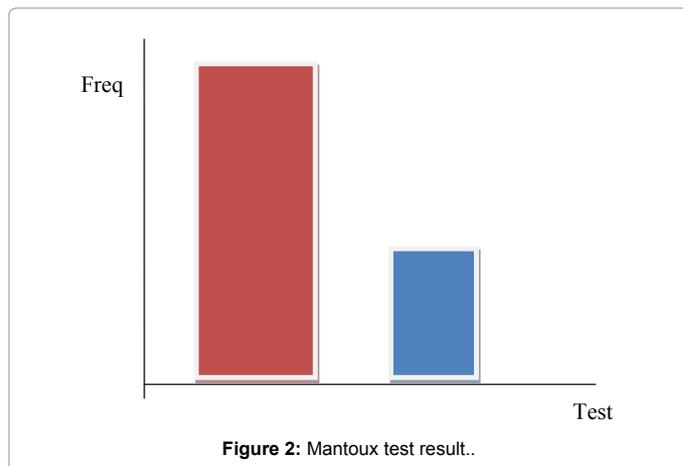
X-ray findings showed that 49 (47.4%) patients and 14 (13.9%) patients had x-ray findings of vertebral body wedge collapse and narrowing of disc space respectively. Others had x-ray finding of para spinal shadow (3 patients [2.9%]), multiple lung opacities (1 patient [1%]), retrolisthesis (1 patient [1%]), widened joint space (1 patient [1%]), joint destruction with genu valgus deformity (1 patient [1%]) and the rest (28 patients [32.8%]) unremarkable X-ray finding.

The total and differential white blood cell count showed that 84 patients (86.6%) had relative lymphocytosis with lymphocyte count of between 32-84% of total white cell count. Following completion of anti TB drugs the lymphocyte count reduced in 78 patients (80.4%). About 80 patients (82.5%) had elevated ESR of above 20 mm1<sup>st</sup> hr at diagnosis and following successful completion of the anti TB drugs 81 patients (83.5%) had their ESR below 20 mm 1<sup>st</sup> hr as shown in Tables 3 and 4 respectively below.

The antigen test showed that 80 patients (82.5%) had positive Mantoux test while 17 patients (17.5%) had negative test as represented below in Figure 2 with a bar chart.

All the patients that had positive histology report showed central caseation necrosis and peripheral multinucleated giant cells/ lymphocytes.

Anti-TB drugs were given for 8 months in 92 patients (95% of cases) while 5 patients (5% of cases) received it for 12 months. Also, 90 patients (92.8%) had anti TB drugs alone, 1 patient (1%) had additional antibiotics, 2 patients (2.1%) had additional NSAIDS and 4 patients (4.1%) had additional hyperextension jacket. Following treatment, 33 patients (34%) had complete resolution of symptoms, 48 patients (49.5%) had significant improvement of their symptoms, 15 (15.5%) patients had no response to the treatment given and 1 patient (1%) died



Outcome	Freq	%
Complete resolution of symptoms	33	34
Improvement of symptoms	48	49.5
Persistence of symptoms	15	15.5
Died	1	1.0

**Table 5: Outcome of treatment.**

as shown in Table 5 below. Up to 90 patients were followed up to 2 years, while none of the patient tested positive to HIV antibodies.

## Conclusion

From our study, we found that majority of the patients affected with musculoskeletal TB are adults within the age range of 21-50years (60% of cases). It was also found that males and female are almost equally affected (45.2% and 54.8% respectively). This agrees with earlier researches that found there is essentially no sex predilection with TB infection [1]. There are numerous reports highlighting the susceptibility of HIV-positive patients to re-activation of TB infection and that HIV-positive patients are more likely to progress to active disease than immunocompetent individuals [16,17]. But in our study all the patients were immunocompetent. The commonest anatomically involved site was the spine, 57.7% of cases which correlates with other series that reported spinal involvement in about 50% of patients [5,6,18,19]. Majority of the patients, presented with low back pain of about 6 months duration (57.7% of cases) while only one patient (1.0%) presented with chronic ulcer. The most common x-ray finding in our study is wedge collapse of the affected vertebrae (47.4%). In majority of the patients (86.6%) the percentage lymphocyte count was >30% of the total WBC while the ESR was elevated above 20 mm<sup>1st</sup> hour in 82.5% of cases. The Mantoux test was positive in majority of the patient (82.5%) of cases. This agrees with earlier findings on the subject. But it was negative in a significant number of cases (17.5%). The test may be negative in almost 20% of patients with active disease if the disease is disseminated or if the patient is immune compromised or suffering from exanthematous fever [20]. Thus negative Mantoux test alone cannot be used to exclude the diagnosis of TB and its interpretation should actually be done with greatest caution. Most of the patients (95%) were treated with anti TB drugs which included tablet Isoniazide, Rifampicin, Ethambutol and pyrazinamide for duration of 8 months while 5% were extended for 12 months. This agrees with other studies that noted the correct course of anti-TB drugs as the most important aspect of treatment [11]. Following completion of the anti TB drugs majority of the patients showed significant fall in ESR (83.5%) and lymphocyte count (80.4%). About 34% of the patients showed very

excellent outcome with complete resolution of symptoms while 49.5% of the patients showed good outcome with improvement of symptoms. Majority of the patients (83.5%) had treatment with first line anti TB drugs alone. This agrees with other studies that found use of anti-TB drugs as the mainstay of treatment [11]. Only about 16.5% of patients required additional treatment with antibiotics, NSAIDS or application of extension jacket to stabilize the spine. Only one patient (1% of cases) died out of the disease process. Finally, most of the patients (90%) were followed up in the outpatient clinic for duration of about 1-2 years.

Therefore, from our study, we recommend that there should be high index of suspicion among physicians for prompt diagnosis of musculoskeletal TB especially that of the spine. Also once diagnosis is made patient should immediately be commenced on the first line anti TB drugs which majority of the patients usually responds to very well [7,11].

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