

## A STUDY OF NON-SPINAL, EXTRA-ARTICULAR, OSSEOUS TUBERCULOSIS IN A TERTIARY CARE HOSPITAL OF LAHORE - PAKISTAN

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*The incidence and prevalence of tuberculosis has increased tremendously during the present decade and is expected to rise further. A prospective study of 21 patients with osseous tuberculosis was carried out in orthopaedic department unit – I Mayo Hospital, Lahore. The diagnosis was made by physical examination, mantoux and mycodot test, haematological examination, culture (Pus, Urine, Sputum) X-rays of involved area, bone scan and MRI. The patient were discharged on chemotherapy and were advised to visit for follow up for one year on monthly basis for initial four months. Out of 21 patients 19 completed their follow up while 2 were lost during follow up. All patients completed their treatment. Young females in the age group of 10-20 years (66.6%) suffered from the disease more frequently than the other age groups and the male to female ratio was found to be 1:1.6.*

The incidence and prevalence of tuberculosis has increased tremendously during present decade and is expected to rise further<sup>1</sup>. It is true for developing as well as developed countries, in fact tuberculosis remains a major international problem despite advances in radiological diagnosis and anti-tuberculosis therapy<sup>1</sup>. Contributing factors are mainly, HIV infection, poor case finding, inadequate treatment duration, and poor compliance, which results in multi drug resistance tuberculosis<sup>2</sup>.

Mycobacterium tuberculosis can involve virtually any organ of body<sup>3</sup>. 10-15% of disease is extrapulmonary of which 10% is seen in Skeletal system. Mostly involve the spine<sup>4,5</sup>. Joints are next in frequency. In osteoarticular tuberculosis it is difficult to demonstrate or culture acid fast Mycobacteria from the lesion<sup>6</sup>. Tuberculosis of bone with involvement of joint is uncommon disease but its sequelae may be disabling.<sup>7</sup>

Osseous tuberculosis is usually caused secondary to a primary focus located in the body elsewhere, which can be detected only in 50% of cases<sup>8</sup>.

Patients with skeletal tuberculosis usually present with pain, swelling and discharging sinus, beginning of the disease is progressive and fistulae are main reason for consultation<sup>10</sup>. Presentation may be atypical especially in an immunocompromised patients. In advanced lesions diagnosis is even more difficult because radiological picture may mimic chronic pyogenic osteomyelitis, Brodie's abscess, tumours or granulomatous lesions<sup>1</sup>.

The diagnosis was made by history, physical examination, skin test, mycodot, haematological examination, culture (pus, urin, sputum), x-ray of involved area, bone scan and MRI. Biopsy is mandatory to confirm the diagnosis. PCR is a relatively new technique<sup>11</sup>, it is a rapid, sensitive and specific DNA amplification technique for detection of mycobacterium tuberculosis<sup>12</sup>.

The main stay of treatment is chemotherapy. Indications for surgery may be diagnostic or therapeutic, surgery not only controls the disease earlier<sup>13</sup>, but also decreases the length of hospitalisation<sup>14</sup>. For larger symptomatic lesions of weight bearing bones that contain significant sequestra or are in danger of structural collapse, fracture or extension to adjacent joints, particularly in advanced lesions with caseation, fibrosis and destruction of bone and cartilage surgery is essential.

Chemotherapy of disease is divided in two phases initial phase for three months having four drugs and continuous phase of six months having three drugs.

### MATERIAL AND METHODS

A total of 21 patients with osseous tuberculosis were selected, patients of both sex and of all age groups were included in study and was conducted in orthopaedic department, unit I, Mayo Hospital, Lahore.

On first visit patient's history was carefully recorded, mode of presentation, duration of symptoms, other associated illness, history of

previous treatment and its effects, and history of contact in close family member were all recorded.

Patients were evaluated clinically by local and systemic examination, any sinus or swelling were noted, bone involved, site and size of lesion, adjacent joints were examined functionally for its active and passive range of motion. Routine investigations were performed, blood C/E + ESR, urine complete examination, blood sugar, blood urea, LFT's, mantoux test, biplaner x-ray of involved area, bone scan. Hb less than 10 gm% were considered anaemic. No patient was found to be diabetic or anaemic or suffer from any hepatic or renal disorder.

After completing the initial evaluation, the patients were put on list for surgery under appropriate anaesthesia (spinal, general or regional block) currettage of the lesion was done. In 10 cases currettage was only diagnostic and in 11 it was therapeutical as well. It was debrided for granulations, pus, debris and sequestrum.

Biopsy material was divided in three parts, one sent for histopathology (preserved in formaline), other for PCR and remaining one third for culture. All specimens were sent to relevant lab as early as possible ranging from half to two hours. In 13 patients presentation was with sinus, so excision of sinus was also done. In two patients lesion was more than 10 cm and involving weight bearing area so primary bone grafting was also done (first metatarsal and subchondral area of Tibia). All wounds were closed except 6 patients due to poor skin condition. Chemotherapy was started after confirmation of diagnosis by PCR and histopathology.

#### **FOLLOW UP**

The patients were discharged on chemotherapy and were advised to visit for follow up for one year, on monthly basis for initial 4 months and then after every two months for remaining eight months. On each visit patients were thoroughly examined for the response of therapy (clinical and radiological), assessment was made clinically for local and general symptoms. Clinical signs of healing included a decrease in pain and swelling, disappearance of sinuses, improvement in gait and gain in weight. Biplaner x-ray of involved area were taken to assess bone healing, decrease in osteoporosis with repair of scalloped lesions and local sclerosis.

Fresh and visual acuity to see effectiveness of chemotherapy and to observe the toxic effects of drugs were performed regularly.

Out of 21 patients 19 completed their follow up while 2 patients were lost during follow up. All patients had completed their treatment.

#### **RESULTS**

Young females were found to be most vulnerable to tuberculosis. Majority was among 10-20 years 14 (66.67%) and female to male ratio was found to be 1.6-1.

Painless sinus was the leading mode of presentation seen in 13 patients (61.90%), followed by pain with swelling in 6 (28.58%), 2 (9.53%) had soft cystic swelling with fluctuation. Majority of our patients 18 (85.72%) visited after four weeks and 3 (14.28%) presented within a month, no patient presented within a week.

Duration of disease was from 1 month to 36 months with average duration of 6.92 months. Most common bone involve was tibia (6) femur, ulna (3) fibula, metacarpal, metatarsal cuboid (2) and radius (1). Fifteen patients (71.42%) had lesions in lower limb and 6 (28.58%) in upper limb. Eighteen patients (85.72%) had metaphyseal lesions and remaining 3 patients had diaphyseal lesions.

Constitutional symptoms were present in nine patients, all of them had fever and seven had associated anorexia. Weight loss was observed in those patients, who had disease of long duration from (6 months – 36 months). In eleven patients no constitutional symptom was observed.

Multifocal disease was observed in two patients, one had three lesions, (left proximal fibula, right distal fibula and 5th rib). Her dorsal spine (D8-9) was also tender but x-rays were normal and bone scan was showing hot area. Other patient had two lesions (in subchondral area of left tibia and 5th rib). Nineteen patients had solitary lesion. Primary focus in lungs could be detected only in three patients (14.29%). Four patients had history of contact in family (2) mother, (1) Elder brother. Out of 15 lesion in lower limb only three had palpable inguinal lymph nodes.

Six patients had negative response 28.57% induration less than 5 mm in mantoux test. Four had (19.04%) borderline induration less than 5-10mm and remaining eleven had positive reaction more than 10mm.

Four patients had ESR less than 20mm. Seven had above 50 mm and eleven had 20-50 mm. Haemoglobin less than 10 gm % was considered anaemic 08 were (38.09%) anaemic. Fourteen patients (66.66%) had lesion less than 5 cm in size. 6 (28.57%) in between 5-10 cm and only one (4.76%) had lesion more than 10 cm in size.

Twelve patients (57.14%) had radiological features of osteolytic defect with cortical erosion, followed by cystic expansion of bone (Brodies abscess) in 7 patients (33.33%) and in 2 patients it

was closely related to chronic pyogenic osteomyelitis with sequestrum.

## DISCUSSION

Literature on non spinal, extra-articular, osseous tuberculosis is limited but common on tuberculous arthritis and Pott's disease, so the comparison with previous studies was found to be a difficult task. Tuberculosis remains a major cause of skeletal infection in many parts of the world. Our aim was pay on tuberculous osteomyelitis which is rare when compared with skeletal tuberculosis involving the spine and joint. In about 50% of patients the vertebrae are the site of skeletal involvement<sup>4,5</sup> and isolated bone involvement without spread to a joint often fails to attract attention. Because of the subtle nature of the symptoms, the diagnosis is not made until the process is well advanced. The variable clinical and radiological pictures may mimic chronic pyogenic osteomyelitis, Brodies' abscess, tumors or granulomatous lesions. Tuberculosis has been reported in all bones of the body. In united States the spine is involved in 50% of patients; the pelvis, in 12%; the hip and femur, in 10%; the knee and tibia, in 10%; the ribs in, 7%; the ankle and shoulder, in 2%; elbow and wrist, in 2%; and multiple sites, in 3%<sup>15</sup>.

In this study young adults in teen age group are found to be common sufferers. Among 21 patients 14 are in 11-20 years of age with a percentage of 66.67%. It is alarming and significant showing high prevalence of tuberculosis in our country. These results are in accordance with Hugh<sup>15</sup> who stated that when the prevalence of tuberculosis in a community is high, most of the population in that community has been infected by the age of twenty years. These results are also in accordance with the studies in India<sup>1</sup> and Pakistan<sup>16</sup>, where tuberculosis was found to be more common in young age group.

Females are predominant in the study having

tuberculosis with 61.90%. It is perhaps due to less access to health care and more prone to live with risk factors, low socioeconomic status, poor housing conditions with poor or no ventilation and sun light. Most of the females are from the interior of Lahore where people live in small houses with large number of family members sleeping in the same room.

Sinuses were found to be most common mode of presentation in our study. In 21 patients 13 were with painless sinuses (61.90%), next was with swelling and pain six patients (28.57%), one with painful sinus and one patient with pathological fracture and pain.

This comparison shows that sinus is more common symptom in this part of the world. The reason might be late presentation of the patients. Nearly all of our patients had initial treatment with NSAID, which offered some relief of pain or swelling and decrease in discharge. The repeated use of these drugs created a false sense of security until it became apparent that their continued use had failed to provide any relief, when they decided to come in hospital for consultation.

The poor awareness of the patients about the disease can be assessed from this that one patient had sinus which was secondary to incision and drainage done by a local Jarah. One patient 13 years of age had sinus on forearm since last four months, then he got fracture of radius and ulna, later it was diagnosed as a case of dysphysial tuberculosis.

No patient presented within a week. Majority of the patients visited Orthopaedic department after four weeks with an average duration of symptoms about 6.92 months. About seven months of treatment from local general practitioner (G.P.). Bone Setter and Jarah they visited hospital and consulted orthopaedic surgeon. Early diagnosis of disease can be made by improving the knowledge at G. P. level.

### Previous Studies had Presentation in this Ratio

Study	Year	No. of Patients	Sinus	Pain and Swelling	Abscess	Mis.
Zareena Niazi	1989	27	10	04	06	07
Vohra Rajeev	1997	25	08	11	06	-
Study	2000	21	13	06	02	-

Study	Total Cases	Metaphysis	Diaphysis	Epiphysis	Mis.
2000	21	18	03	-	-
M.N Rasool 1994	17	09	01	03	04

Eighteen lesions were detected in metaphyseal area (85.71%) and only three in diaphyseal area (14.29%), showing metaphysis to be favourable site for tuberculosis. This is the same observation made by Rasool in 1994 in a study of tuberculosis in children. The metaphysis of the long bones is often the site of infection. This predilection is probably due to vascular structure of long bones in this region<sup>17</sup>. Tubercle bacilli lodge in the small terminal branches of the arteries of the metaphysis and grow, caseate and produce the lesion.

Lower limbs of body were found to be more susceptible to tuberculosis than upper limb. Sixteen lesions (72.73%) were present in lower limb and six in upper limb (27.27%). Distribution of bones in body was like this.

#### Lower Limbs

Bone Involved	No. of Cases	Percentage
Tibia	06	28.57
Femur	03	14.24
Fibula	03	14.24
Metatarsal	02	09.52
Cuboid	02	09.52

#### Upper Limb

Bone Involved	No. of Cases	Percentage
Ulna	03	14.24
Metacarpal	02	09.52
Radius	01	04.76

Two patients had multifocal disease. These findings are in accordance with the incidence percentage of the study by Hugh<sup>15</sup>. Tuberculosis was reported in all bones of the body but tibia and its metaphysis was found most common and vulnerable site for infection. In this study nineteen patients had solitary lesions and only two had multifocal disease.

Study	Total Cases	Solitary	Multifocal
2000	21	19	02
M.N. Rasool (1994)	13	10	03

The multifocal form is exceptional even in endemic countries of tuberculosis. It constitutes less than 5% of all cases of osseous tuberculosis<sup>10</sup>.

According to Kumar and Saxena in 1988 bones lesions are usually solitary because sensitisation of the patient to the tubercle bacilli occurs before the onset of skeletal disease. However if the host immunity is poor and the immune response has been altered the lesion may multiply. Since tubercle bacilli are blood born, individual lesions start at different sites and multifocal lesions may be seen at different stages of development.

Majority of our patients (66.66%) had lesions less than 5 cm in size. Six (28.57%) had lesions in between 5-10 cm and only one (4.76%) had a lesion more than 10 cm. Size of the lesion depends upon chronicity of the disease i.e the delay in proper diagnosis or delay in getting proper treatment. The general health of the patient, associated symptoms, superadded infection, nutritional and immunological status of the patient, all contributed to the size of the lesion. Radiological picture of the lesion was different in different patients. Osteolytic defect with cortical erosion was most common in 12 (57.14%), followed by cystic expansion of bone or Brodie's abscess in 7 (33.33%). In 2 patients (9.52%) findings were closely related to chronic pyogenic osteomyelitis with sequestrum.

In majority of the cases the gross appearance of material obtained during biopsy was caseous in nature (66.66%), followed by caseous material associated with pus in three patients (14.24%). One had (4.76%) granulation with caseation, 2 (9.52%) had pus, debris and sequestrum per operatively and one patient had fleshy appearance closely resembling to Giant Cell Tumor of bone.

The gross appearance of biopsy material depends on the condition of the wound / sinus, duration of treatment. Site of lesion and size also contribute to gross appearance of biopsy material.

**In conclusion** osseous tuberculosis is common in young adult, females, living in poor housing conditions, houses with poor or no ventilation and without sun light. Persons with low socio-economic setup are mainly affected. It is more common in walled city. Health education, early diagnosis and adequate treatment facilities can help to minimize the risk of developing subsequent skeletal deformities.

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