

STUDY OF NON-SPINAL, EXTRA-ARTICULAR, OSSEOUS TUBERCULOSIS, ITS MODES OF PRESENTATION, DIAGNOSTIC PITFALLS AND TREATMENT

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INTRODUCTION

The incidence and prevalence of tuberculosis has increased tremendously during present decade and is expected to rise further. 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-tuberculous therapy (Vohra et al 1997). Contributing factors are mainly, HIV infection, poor case finding, improper treatment in doses and duration, and poor compliance, which results in multi drug resistance tuberculosis (Narain et al, 1992).

Mycobacterium tuberculosis can involve virtually any organ of body (Siddiqui et al 1997) lungs are most frequent site but 10-15% of disease is extra pulmonary, 10% of extra-pulmonary is Skeletal, in it 50% involve the spine (Popel et al 1953; Abdle Wahab et al, 1988) joints are next in frequency, tuberculosis of bone without involvement of joint is uncommon disease but its sequelae may be disabling (Tadashi, 1995) and may not be diagnosed early by an orthopaedic surgeon (Vohra et al 1997).

Intraosseous tuberculosis is usually caused secondary to a primary focus located in the body else where, which can be located only in 50% of case (Davidson, 1970). Goldblatt and Cremin (1978) showed results upto 31%.

Patient with skeletal tuberculosis usually presents with pain, swelling and discharging sinus, beginning of the disease is progressive and fistulae are main reason of consultation (Moihtahid, 1995). Presentation may be atypical especially in an immuno-compromised patients. In advanced lesions diagnosis is even more difficult because radiological picture may mimic chronic pyogenic osteomyelitis, brodie's abscess, tumours or granulomatous lesions (Vohra et al 1997).

To diagnose full history, complete physical examination, skin test, mycodot, haematological examination, culture (pus, urin, sputum), x-ray of involved area, bone scan and MRI performed. Biopsy is mandatory to confirm the diagnosis. PCR is relatively new technique (Saiki 1988), it is a

rapid, sensitive and specific DNA amplification technique for detection of mycobacterium tuberculosis (Noordhock, 1995).

To treat the lesion, when indicated surgical intervention is due to promote healing but chemotherapy is mandatory. Indications for surgery may be diagnostic or therapeutic, surgery not only control the disease earlier (Griffith, 1979) but also decreases the length of hospitalization (Nicholisan 1974). 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, the vascularity of such are markedly reduced by extensive scarring.

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 group were included in study and was conducted in orthopaedic department, unit I, Mayo Hospital, Lahore.

On first visit patient's bio data and history was carefully recorded, as mode of presentation, duration of symptoms, other associated illness, history of previous treatment and its effects, and history of contact in close family member.

Patients were evaluated clinically for 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 C/E, blood sugar, blood urea, LFT's, montoux test, biplaner x-ray of involved area, bone scan. Hb less than 10 gm % were considered anemic. No patient was found to be diabetic or sufferer of hepatic or renal disorder.

After completing the initial evaluation, the patients were put on list for surgery to confirm the diagnosis on histopathology and PCR.

In appropriate anaesthesia (spinal, general or regional block) curettage of the lesion was done. In 10 cases curettage 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 are sent for histopathology / embedded formaline), other for PCR and remaining one third for C/S sent as such all specimen 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, lesion was more than 10 cm and involving wt 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. The regimen used was Rifampicin (10 ml/kg in adults and 10-20 mg/kg in children). Isoniazid (5-10 mg/kg in adults and 10-20 mg/kg in children) Pyrazinamide (20-40 mg/kg) Eihambutol 20-30 mg/kg body weight. The regimen was 3 HRZE/6 hr.

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 in 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 Hb, ESR, LFT's and visual acuity to see effectiveness of chemotherapy and to observe the toxic effects of drugs.

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 female was 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 leading mode of presentation 13 (61.90%), followed by pain with swelling in 6(28.58%) patients, 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 month with average duration of 6.92 months. Most common bone was tibia (6) femur, ulna (3) fibula, metacarpal, metatarsal cuboid (2) and radius (1). 15 patients (71.42%) had lesions in lower limb and 6 (28.58%) in upper limb. 18 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, they 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 but bone scan was showing not 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 H/O contact in family (2) mother, (1) father (1) Elder brother). Out of 15 lesions 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. Hb less than 10 gm % was considered anemic 08 were (38.09%) anemic. 14 patients (66.66%) had lesions less than 5 cm in size. 6 (28.57%) in between 5-10 cm and only one (4.76%) had lesions more than 10 cm in size.

12 patients 57.14% had radiological features of osteolytic defect with cortical erosion, followed by cystic expansion of bone (Brodie's 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 comparison with previous studies was found to be a difficult task. Tuberculosis remains a major cause of skeletal infection in many part of the world. Our aim was attention to 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 (Poppel et al 1953 ; Abdelwahab et al 1988) 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% (Hugh G et al 1996).

In this study young adults in teen age group are found to be common sufferer. 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 G 1996 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 (Rajeev Vohra et al 1997) and Pakistan (Zarina Niazi 1989), tuberculosis is 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 socio-economic status, poor housing conditions with poor or noventilation and sun light. Most of the females are from interior Lahore where people live in small houses with large number of family members sleeping together in the same room.

Sinus were found to be most common mode of presentation in our study. In 21 patients 13 were with painless sinus with 61.90%, next one 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 complete relieve, then 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 thirteen 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 G.P (General Practitioner), Bone Setter and Jarah they visited hospital and consulted orthopaedic surgeon. So advancement in 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	4	6	7
Vohra Rajeev	1997	25	8	11	6	-
Study	2000	21	13	6	2	-

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

Eighteen lesion were detected in metaphyseal area (85.71%) and only three in dyaphyseal area (14.29%), showing metaphysis to be favourable site for tuberculosis. This is same observation made by **M.N 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 (**Edeikin et al 1963**). 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	9.52
Cuboid	02	9.52

Upper Limb

Bone Involved	No. of Cases	Percentage
Ulna	03	14.24
Metacarpal	02	9.52
Radius	01	4.76

Two patients had multifocal disease. These findings are in accordance with the incidence percentage of the study by (Hugh. G et al 1996). 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 ninteen 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 (Moujtahid. M et al 1995).

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.

Two patients with multifocal disease were interesting for brief discription.

A thirteen years old female presented in OPD with complaint of sinus over right ankle, swelling around left knee and pain in front of chest associated with pain in dorsal spine. On x-ray cystic lesions were found in left proximal fibula and fifth rib and osteolytic defect in right distal fistula. X-ray of spine was normal but bone scan showed increase uptake in D9-10 vertebrae proving bone scan to be more sensitive than x-ray. Pain in dorsal spine was relieved after six weeks of taking chemotherapy.

A 42 years old male patient presented with pain and swelling over left knee and a small sinus in front of chest. X-ray showing an osteolytic defect at subchondral area and ecentrically located resembling to Giant Cell Tumor, second lesion was present in fifth rib. After investigation and confirmation with histopathology and P.C.R, it was diagnosed as tuberculous osteomyelitis, chemotherapy was started and the patient recovered.

Majority of our patients 14 (66.66%) had lesion less than 5 cm in size. Six (28.57%) had lesion 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 smaller or larger size of the lesion.

Radiological picture of the lesion was different in different patients table 11.6. Osteolytic defect with cortical erosion was most common in 12 (57.14%), followed by cystic expansion of bone or Brodies abscess in 7 (33.33%). While in 2 patients (9.52%) findings were closely related to chronic pyogenic osteomyelitis with sequestrum.

In majority of cases the gross appearance of material obtained during biopsy was caseous in

nature 14 (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 Table 11.7.

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

CONCLUSION AND RECOMMENDATIONS

Osseous tuberculosis is common in young adult, females, living in poor housing conditions, houses with poor or no ventilation and with out sun light.

Persons with low socio-economic setup are mainly affected. It is more common in wall city. In our society patients are not aware about the severity of the disease as most of them reported in the hospital at later stage average duration was 6.92 months. All of our patients wasted about 7 months by visiting local doctors, Bone Setter or Jarah. Nearly all of them had initial treatment with non-sterided anti-inflammatory drugs and antibiotics which offered some relief of pain and swelling or both. So repeated use of these drugs created a false sense of security until it became apparent that their continued use had failed to provide complete.....

REFERENCES

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