

## OSTEOARTICULAR TUBERCULOSIS IN CHILDREN

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### ABSTRACT

One hundred and four cases of osteoarticular tuberculosis were studied. There were 74 boys (71.2%) and 30 girls (28.8%). The mean age at the onset of symptoms was 7.3 years, ranging from 9 months to 18 years. Seventy four cases (71%) reported 3 months after onset of symptoms. The spine was the commonest site involved (43%) followed by hip (14.9%) and knee joints (10.3%). Evidence of active or inactive pulmonary tuberculosis was found in 16.2%. All cases were treated by three drug regimen of rifampicin, isoniazid and ethambutol; rifampicin was discontinued after 6 months, ethambutol after 12-14 months. In 12 cases (11.5%) isoniazid was continued for 18 months. Along with chemotherapy suitable braces, splints, tractions, exercises and other form of physical therapy produced satisfactory results. Seventy eight patients (75%) showed clinical and radiological improvement with one year of treatment. The follow up period ranged between 4 months to 24 months with an average of 17 months. Children because of capacity to grow, showed progressive deformity in knee in 3 cases (2.8%), hip in 98 cases (8.6%), shortening of limbs in 14 cases (13.4%) and kyphosis in 13 cases (12.5%).

**Key words:** Bone and joint tuberculosis, Tuberculous osteomyelitis.

Skeletal tuberculosis continues to be a major health hazard in the developing countries. The therapy of osteoarticular tuberculosis is difficult in children as the diagnosis is often delayed and the disease is more severe with marked deformities. In order to study the clinical profile and response to the therapy, we retrospectively evaluated the case records of 104 cases of osteoarticular tuberculosis.

### Material and Methods

One hundred and four patients with osteoarticular tuberculosis attending this hospital from January 1987 to January 1989 were studied. The age of the patients ranged from 9 months to 18 years. A detailed history, physical examination and necessary investigations were carried out before the patients were selected for study. Local symptoms and signs were pain, night cries, painful limitation of movements, muscle wasting, discharging sinuses and swelling of the part. Diagnosis was made on the clinical and radiological findings. Roentgenogram of the part and chest were done. Localized osteoporosis was the constant radiological sign of active disease. The articular margins and bony cortices were hazy with bony destruction and diminution of joint space. In osseous lesions, radiograph revealed irregular cavities and

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areas of destruction in the bone with little subperiosteal new bone formation. Irregular fuzzy paradiscal margin with diminution of disc space were the features in the X-rays of spine. Blood investigations revealed low hemoglobin, lymphocytosis, raised erythrocyte sedimentation rate. Whenever there was doubt, biopsy of the diseased material was performed (21 cases). A Mantoux test with one tuberculin unit was performed in every case; induration more than 10 mm at 48 hours was considered positive. Pus from 25 patients with abscesses and 15 draining sinuses were examined for acid fast bacilli (AFB) in a direct smear examination after staining with Zeihl Neilsen stain.

A three drug regimen consisting of rifampicin (10 mg/kg), ethambutol (15 mg/kg) and isoniazid (5 mg/kg) was started in all cases. Rifampicin was withdrawn after an average of 6 months; isoniazid and ethambutol continued till clinico-radiological healing of the disease (average 12 months) and in 12 cases isoniazid was continued for another 6 months. At the initial period of the therapy, rest was provided with help of suitable orthotics, plaster application or traction. With improvement in pain and spasm, patients were encouraged to carry out mobilization exercises of the joints. We tried to correct the deformity by traction or plaster wedging. The patients with involvement of the spine were put on complete bed rest for the initial 2 to 4 months depending upon the severity, followed by sitting and standing with support. Antitubercular drugs were continued for minimum of 18 months. Patients were followed up every three months and were assessed clinically and radiologically. Clinical criteria for healing were absence of constitutional symptoms, disappearance of local pain, tenderness, spasm, healing of

abscesses, sinuses and return of painless motion. Radiologically there was remineralization and restoration of smooth bony outlines and trabeculae. In spine smooth paradiscal margin or complete bone block formation was taken for healing. On blood examination, ESR values were within normal range. After the course of treatment was over, patients were instructed to come back every 6 months for another 2 years to detect reactivation of the disease.

## Results

Of the 104 patients 74 were boys and 30 girls. Forty three cases belonged to the 5 to 8 years age group. The mean age at the onset of symptoms was 7.3 years. The duration of symptoms at the time of presentation varied between 3 weeks to 20 months. Seventy four patients (71%) presented three months after the onset of symptoms. A history of contact with a patient of active tuberculosis was obtained in 13.5% cases. Only three children were immunized against tuberculosis. Seventy nine children (75%) showed positive Mantoux test. Skiagram of the chest showed evidence of active or healed tuberculosis in 12 cases; one patient had evidence of tubercular lymphadenitis. Pus examination from 15 sinuses and 3 abscesses grew *Staphylococcus aureus*. AFB were not seen in smear examination in any patient. Histopathological examination of material from the bones or joints showed features suggestive of tuberculosis in 14 (66.6%) of the 21 cases.

The dorsolumbar region (*Fig. 1*) was most commonly involved in the 46 cases (43%) of spine followed by hip joint in 16 cases (14.9%) (*Fig. 2*) and knee joint in 11 cases (10.3%). Tubercular osteomyelitis without involvement of joint occurred in 19 cases (18.2%). Patients with tuberculous arthritis presented with deformity, limp,



*Fig. 1. X-ray spine showing marked destruction of L 2/3 vertebral body, kyphotic deformity and gross diminution of disc space between L 2/3.*

stiffness, pain and discharging sinuses. Advanced cases of arthritis of the knee presented with triple deformity of knee (flexion, posterior and lateral subluxation). Patients with tuberculosis of the spine presented with kyphosis, pain, spasm of paraspinal muscles and paraparesis (5 cases). The main features of tubercular osteomyelitis were pain, discharging sinuses and thickening of diaphyseal region on X-ray examination. Radiologically involvement of growth plate and premature fusion was seen in 14 cases.

Tubercular sinuses started healing within 3-4 months after initiation of therapy; new abscesses were not seen 5-6



*Fig. 2. X-ray of right hip joint showing destructive changes in acetabular and femoral head; wandering acetabulum, lower part of the acetabular cavity is empty and the capital femoral epiphysis is sequestered.*

months after starting the antitubercular drugs. Clinico-radiologically the disease appeared healed around 12-14 months in 78% cases. Deformity and stiffness of joints though improved, persisted throughout the course of the therapy and follow up. Eight patients showed a significant increase of 15 degree in the angle of kyphosis, when followed for an average of 24 months. Cases with growth plate involvement showed shortening of the limbs. Five cases with spinal tuberculosis who presented with paraparesis recovered with conservative therapy alone. Nine cases of tuberculous arthritis of hip had residual deformity of 20-70 degree of flexion and 10-30 degree of adduction at hip whereas three cases of knee joint affection had 20-30 degree of flexion at knee joint in their last follow up.

### Discussion

The diagnosis of osteoarticular tuberculosis is often missed in early stages. It is not infrequent to find that patient has

received inadequate therapy prior to referral to this hospital. This modifies the clinico radiological picture and reduced ability for detection of AFB on smear examination. In this study, smear for AFB was negative in all the cases. An earlier report(1) from this centre had reported positive AFB smear examination in 49.5%. Obtaining tissue from deeper surfaces and the use of concentration methods could have improved the detection of AFB.

The children with involvement of joints presented in the stage of advanced arthritis with marked deformity, shortening, joint destruction and stiffness. The spine (43%) remained the commonest site to be affected followed by hip joint (14.9%), as reported by others(2-4). The incidence of neurological complication was 11% in the present series as compared with 20-43% in other studies(5,6). In the spine, tuberculous lesions often develop anteriorly affecting the anterior portion of the vertebral bodies and the adjacent cartilages. The destroyed anterior portion does not grow while the unaffected posterior portion continues to grow. This increases the angulation and progressive stretching of cord. In long term follow up these children may present with late onset paraplegia.

Tubercular osteomyelitis including 5 cases with involvement of the tarsal bone was observed in 19 cases (18.2%). Earlier studies have reported an incidence of tuberculosis involving these bones in only 2 to 3% of cases(7-9).

The three drug schedule of rifampicin, isoniazid and ethambutol was associated with satisfactory clinico-radiologic response. In view of a satisfactory response to therapy, rifampicin was discontinued at 6 months; at 12-14 months ethambutol was also discontinued. Isoniazid was continued for a maximum of 18 months in view of

contact with the patients of active tuberculosis. The protocol of chemotherapy is not in agreement with previous protocols (10,11) but it produced satisfactory results without any side effect or recurrences. With the introduction of newer, more potent antitubercular drugs, and better acceptance of short term chemotherapy(12) it is likely that drug therapy may be modified even further.

Early diagnosis, and treatment where the joint surfaces are not involved may give rise to a painless, stable and mobile joint. When the disease has advanced and has led to the destruction of articular cartilage or pathological dislocation, restoration of normal anatomy and function is difficult particularly in children. Surgical intervention would be recommended for correction of gross deformities, mobilization of grossly stiff joints and paraplegia not responding to conservative treatment.

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## NOTES AND NEWS

### NATIONAL WORKSHOP ON COMMUNICATION STRATEGIES FOR CARE OF NEWBORN

A National Workshop on 'Communication Strategies for Care of Newborn', organized by National Neonatology Forum in collaboration with Vivekananda Institute of Medical Sciences, Calcutta, will be held at Seminar Hall, Vivekananda Institute of Medical Sciences, Calcutta on 15-16th November, 1992.

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