

A decade of skeletal tuberculosis

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SUMMARY Thirty-eight of 58 patients with skeletal tuberculosis (TB) reviewed were immigrants and 20 were of British indigenous origin. Spinal involvement in 28 cases was less common than involvement of peripheral joints, bones, or tendon sheaths (30 cases). Predisposing factors, including previous TB, were present in 70% of British patients and 31% of immigrants. Follow-up study of 23 cases showed that a complete clinical recovery of the skeletal disease was more likely in immigrants than indigenous cases and also in cases referred to hospital early. Immigrants presented usually within 5 years after arrival in Britain and at a younger age than indigenous cases; a quarter had additional sites of infection outside the skeletal system. Skeletal tuberculosis in the indigenous population remains very uncommon, and in half of these cases a history of previous TB was given. The need for continued awareness of skeletal TB is stressed, especially in immigrants, and also the importance of early diagnosis and institution of appropriate therapy.

In the British Isles the incidence of tuberculosis (TB), both pulmonary and extrapulmonary, has been steadily declining, and in the past 20 years has fallen by 12% per annum.¹ However, the notification rate of TB in immigrants, particularly Asians, has been steadily increasing. In some centres in Britain TB is now more common in immigrants than in the indigenous population.^{2,3} Skeletal TB remains a rare site of extrapulmonary TB and now presents infrequently to most hospital departments. It is recognised that early diagnosis is important, as early treatment results in cure and avoids the high morbidity that occurred before antituberculous therapy came in. We have undertaken a retrospective and follow-up study to assess the experience gained by all departments of the London Hospital in the management of skeletal TB. The London Hospital has always served a changing immigrant population, which in recent years has been increasingly of Asian peoples, especially from the Indian subcontinent.

Materials and Methods

A retrospective and follow-up study of musculoskeletal tuberculosis presenting to the London Hospital in the decade 1969-78 was performed. The records of all hospital inpatients indexed as having

musculoskeletal TB were reviewed and 58 cases were identified (2 of which have been the subject of an earlier publication⁴). Forty patients had either histological evidence of TB or tubercle bacilli had been isolated from synovial fluid or biopsy specimen. An additional 18 cases were included, 11 with spinal disease. These 18 cases had clinical and radiological features characteristic of TB which responded to antituberculous therapy but without histological or microbiological confirmation. A letter was sent to 53 patients (5 whose records showed they had died being excluded) inviting them to attend once for an additional follow-up consultation in the rheumatology department. Twenty-three patients attended for follow-up in response to the letter and were questioned about residual symptoms, examined clinically, and categorised as follows: (1) complete recovery, with residual signs but without residual symptoms or disability; or (2) partial recovery, with residual signs and residual symptoms, and/or disability.

Results

Thirty-eight of the 58 patients whose records were included were immigrants and 20 were from the British indigenous population. Most immigrants (33/38) originated from the Indian subcontinent; other ethnic groups were African (4) and West Indian (1). The number of cases presenting each year and the ratio coming from the indigenous or

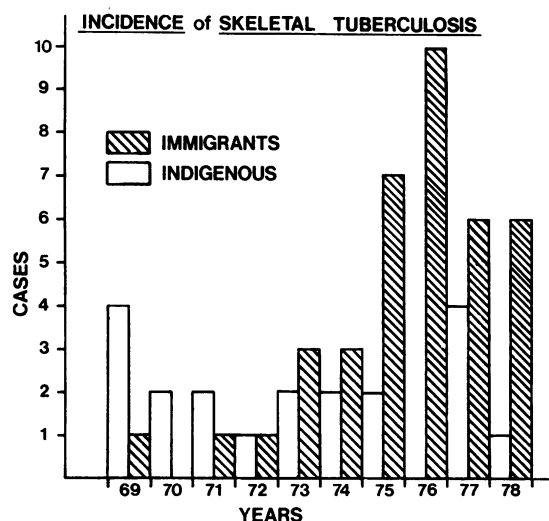


Fig. 1 Incidence of skeletal tuberculosis

immigrant populations are shown in Fig. 1. Immigrants presented at a younger age than British patients, their mean age being 35 years (range 11–65) compared with 52 years (range 12–74) in the indigenous population. Eighteen of the 30 immigrants for whom this information was known had been in Britain for less than 5 years when their TB was diagnosed. Females (32) outnumbered males (26) with a ratio of 1.23/1, but the female preponderance arose from the indigenous cases (14 of 20) rather than the immigrants (18 of 38).

The hospital departments to which patients were initially referred were as follows: orthopaedic (20), rheumatology (16), general medical (13), neurosurgical (4), neurology (2), general surgery (2), and paediatrics (1). Thus the majority of cases (62%) were initially referred to orthopaedic or rheumatology departments.

The sites involved by skeletal TB are shown in Table 1. Spinal regions affected were cervical in 2

Table 1 Sites involved with skeletal tuberculosis

| Site | Indigenous | Immigrant | Total |
|------------------|------------|-----------|-------|
| Spine | 6 | 22 | 28 |
| Knee | 2 | 3 | 5 |
| Ankle | 3 | 2 | 5 |
| Hip | 2 | 2 | 4 |
| Wrist | 2 | 1 | 3 |
| Rib | 2 | 1 | 3 |
| Elbow | 1 | 1 | 2 |
| Gluteal bursitis | 2 | 0 | 2 |
| Dactylitis | 0 | 2 | 2 |
| Others* | 0 | 4 | 4 |

* Scapula, tibia, palmar ganglion, sacroiliac joint.

cases, thoracic in 13 cases, and lumbar in 13 cases. Spinal TB was more common in the immigrant than in the indigenous population. Sites outside the skeletal system were affected in 13 cases (22%), 10 in immigrants and 3 in the indigenous group as shown in Table 2. One patient with a tuberculous palmar ganglion had both genitourinary and pulmonary TB.

Two immigrant patients had more than 1 skeletal site involved with TB, namely, dactylitis and tenosynovitis in one and shoulder and bilateral hip involvement in another.

The mean duration of symptoms at the time of hospital presentation was 1.9 years (2 weeks–10 years) in the indigenous and 0.8 years (4 weeks–3.0 years) in the immigrant group.

Pain was the commonest presenting symptom, occurring in 55 out of 58 cases; swelling occurred at 24 of 30 nonspinal sites. Four cases with tuberculous arthritis presented with pain, swelling, and associated sinus formation. Neurological manifestations were present in 13 spinal cases, being nerve root pain in 7 cases, a progressive paraplegia in 4 cases, and a progressive quadriplegia in 2 cases.

Recognised predisposing factors were present in 14 of the 20 indigenous cases compared with 11 of the 38 immigrant cases. These factors were previous pulmonary TB, reactivation of skeletal TB at the same site, a history of recent contact with TB, systemic steroid therapy, and trauma (Table 3). Ten indigenous patients gave a history of having had TB before triple therapy was available. The sites of reactivation were knee (2 cases), spine (1 case), ankle (1 case), and hip (1 case). In 3 immigrants pulmonary TB had occurred within the previous 5

Table 2 Tuberculous involvement of sites outside the skeletal system

| | Indigenous | Immigrant |
|----------------|------------|-----------|
| Pulmonary | 2 | 4* |
| Adenitis | 0 | 4 |
| Genito-urinary | 0 | 1* |
| Miliary | 1 | 1 |
| Meningeal | 0 | 1 |
| No. of cases | 3 | 10 |

* Both sites involved in 1 case.

Table 3 Predisposing factors

| | Indigenous | Immigrant |
|-----------------------------|------------|-----------|
| Previous pulmonary TB | 5 | 3 |
| Reactivation of skeletal TB | 5 | 0 |
| Recent TB contact | 3 | 6 |
| Steroid therapy | 1 | 1 |
| Trauma | 0 | 1 |
| No. of cases | 14 | 11 |

years and been treated with less than 6 months' antituberculous therapy. This inadequate treatment occurred when the patients temporarily returned to their country of origin. Systemic steroid therapy resulted in reactivation of TB in 2 cases. In 1 immigrant case with active pulmonary TB tuberculous osteomyelitis occurred at the same site as a previous traumatic fracture.

The correct initial diagnosis was made in 30 cases (52%) in the hospital department to which the patient was first referred. In 3 cases (2 immigrant and 1 British) the diagnosis was made only at post-mortem.

The mean erythrocyte sedimentation rate (ESR) at the time of presentation was 52 mm/hour (range 7–110 mm/hour) in the 51 cases tested. In 6 cases the ESR was less than 20 mm/hour. Radioisotope scanning was performed in 10 cases. Increased radioisotope uptake corresponded to the radiological abnormalities in 8 cases of spinal TB, but in no case was this of additional diagnostic value. Scanning gave misleading results in 2 cases; one of biopsy-proved sacroiliac TB had a normal scan, and in another increased radioisotope uptake was incorrectly assumed to be due to involvement of the underlying ankle joint when it was due to TB tenosynovitis.

The histological appearance of biopsy specimens was diagnostic of TB in 34 of 37 cases, 10 of which were spinal. In the 3 cases (ankle, hip, and sacroiliac joint) in which histology was not diagnostic of TB a nonspecific inflammatory infiltrate was the only abnormality despite the subsequent bacteriological isolation of *Mycobacterium tuberculosis* from biopsy material or synovial fluid. Diagnosis was delayed in 2 of the 10 spinal cases in which preliminary drill biopsies were negative but in which subsequent histological proof was obtained at open biopsy. Bacteriological examination of synovial fluid, pus, or biopsy specimen was diagnostic of TB in 34 out of 40 cases. *M. tuberculosis* was isolated in 32 cases. Other mycobacteria were *M. bovis* isolated from an abscess overlying dactylitis in a Bangladeshi boy and *M. kansasii* isolated from a wrist joint of a British man.

Surgical treatment was undertaken in 18 out of 28 cases of spinal TB (drainage of abscesses 11, spinal fusion 4, or laminectomy 3) and in 7 of the 11 cases of tuberculosis arthritis (synovectomy, knee 3, wrist 1) or arthrodesis (ankle 2, hip 1).

Antituberculous therapy was given in 55 of the 58 cases. The 3 untreated cases were not diagnosed as having TB until after death. Triple drug therapy was begun in 44 cases and double therapy in 11 cases and was continued for more than 1 year in 40. Four

immigrants returned home to their country of origin and were lost to follow-up after a mean duration of treatment of 5 months.

Follow-up study

Twenty-six of the 53 patients responded to the follow-up letter; 22 were reviewed in the rheumatology department and 1 by a colleague in Birmingham. Three patients (2 indigenous and 1 immigrant) were unwilling to attend for review. The clinical outcome at follow-up grouped by affected site into spine, upper or lower limb involvement, and rib involvement is shown in Table 4. The mean duration of follow-up was 4.4 years in indigenous and 3.5 years in immigrant patients. Complete recovery occurred in 5 of 7 immigrants with spinal TB. Upper limb involvement had a more favourable outcome than lower limb involvement. The duration of treatment in all cases which were reviewed exceeded 1 year, but there was no other correlation between the duration of treatment and eventual outcome. Surgical treatment had been performed in 9 of 14 cases which had made a complete recovery and 8 of 9 cases which had made a partial recovery.

Patients who made a complete recovery had been referred to hospital earlier than those who made a partial recovery. There was also a greater delay in referral to hospital among indigenous than immigrant cases, and this was associated with a less favourable outcome.

The estimated duration of supervised antituberculous treatment in the 35 patients who were lost to this follow-up study was 16.6 months in 12 British patients and 13.7 months in 13 immigrants.

Discussion

Tuberculosis remains an important cause of disease in the United Kingdom, with 10 000 new cases and 2500 deaths being reported each year.⁵ Almost a quarter of TB notifications are of disease at non-respiratory sites, with a higher incidence among immigrants. Skeletal TB accounts for about a

Table 4 Clinical status at follow-up

| | Complete recovery | | Partial recovery | | Total number |
|--------------|-------------------|-----------|------------------|-----------|--------------|
| | Indigenous | Immigrant | Indigenous | Immigrant | |
| Spine | 0 | 5 | 0 | 2 | 7 |
| Upper limb | 0 | 3 | 2 | 0 | 5 |
| Lower limb | 2 | 2 | 3 | 2 | 9 |
| Rib | 1 | 1 | 0 | 0 | 2 |
| Total number | 3 | 11 | 5 | 4 | 23 |

seventh of nonrespiratory disease, with approximately 320 new cases being notified in England and Wales each year.⁶

The increasing incidence of skeletal TB among immigrants seen at the London Hospital is in keeping with the 1971 British Thoracic and Tuberculosis survey,² which found that, compared with 1965, there was a 68% increase in TB notifications in immigrants. It was noted in this survey that there was, however, a significant delay in hospital referral in both ethnic groups, particularly in the indigenous cases, and also a failure to make the correct diagnosis in almost half the cases. These factors, which have been reported previously,⁷ stress the need for continued awareness of TB, especially in immigrants, the early diagnosis of which is assisted by having a high index of suspicion.

In our survey immigrants presented earlier, at a younger age, and had a more favourable outcome than indigenous cases despite the fact that a quarter had TB involvement outside the skeletal system. The suggestion has been made that immigrants have a more acute disease with greater systemic upset and also a shorter course of disease with fewer recurrences.³ Follow-up of immigrants proved to be more difficult than of indigenous cases. From our experience we would recommend that for immigrant cases health visitors who can communicate with patients in their own language supervise outpatient drug therapy and encourage patients to attend regular follow-up. Although half of the immigrants were lost to this follow-up study, the estimated duration of treatment of more than 1 year was considered to be adequate.

The importance of control of TB in immigrants on and after arrival in the UK has been stressed and recommendations made by the Joint Tuberculosis Committee.⁸ Few immigrants arrive with active disease, but they suffer endogenous reactivation of previous TB.⁹ The reasons for this reactivation, which may include ethnic, nutritional, or social factors, have yet to be established. Immigrants frequently return to their country of origin, if only temporarily, and in our survey this caused 2 separate problems. First, skeletal TB occurred in 3 patients whose previous pulmonary TB had been inadequately treated when they temporarily returned home. Secondly, 4 patients returned home having completed inadequate antituberculosis therapy for their skeletal TB, and one does not know whether they have received adequate therapy.

The insidious onset of monarthritis, especially in an immigrant, particularly from the Indian sub-continent, should raise the suspicion of TB.¹⁰ Histological and bacteriological examination of synovial fluid or biopsy material should be obtained early and are of equal diagnostic value.¹⁰ Factors which may predispose to tuberculous arthritis are direct joint trauma, intra-articular steroids, drug addiction, rheumatoid arthritis, renal transplantation, and systemic illness.¹⁰⁻¹² Recommendations for combined antituberculous drug therapy and surgical and local treatment have been made.¹³ It is considered that drug therapy should be continued for at least 24 months.¹⁴

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