

A STUDY OF TUBERCULOUS OSTEOMYELITIS IN KARACHI

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ABSTRACT: A study was conducted on 25 suspected cases of tuberculous osteomyelitis. *Mycobacterium tuberculosis* was isolated from 4 cases and *M. bovis*, and atypical *Mycobacteria* from one case each. In 76% cases culture could not be isolated from patients. Other parameters like patient's history, blood picture, radiography were considered diagnostic and patient responded to anti-tuberculous drug. No significant resistance was noted in the isolates against rifampin and isonicotinic acid hydrazine (INH).

KEY WORDS: Tuberculous osteomyelitis, *Mycobacterium tuberculosis*, Rifampin, Isonicotinic acid hydrazine, *Mycobacterium bovis*

INTRODUCTION

Tuberculosis (TB) is a worldwide problem. Approximately 2 billion people have latent infection, 8 million would develop active TB annually, and 2-3 million would die due to TB. Tuberculosis is commonly a disease of the lungs. It can take many extrapulmonary forms, such as lymphadenitis, bone and joint disease, subcutaneous abscesses and meningeal tuberculosis.

With this resurgence, cases with extrapulmonary TB have also shown an increase. Approximately 10-11 % of extrapulmonary TB involves joints and bones, which is approximately 1-3% of all TB cases. The global prevalence of latent joint and bone TB is approximately 19-38 million (Malaviya and Kotwal, 2003).

The most common and significant infections of bones and joints have been classified into three main categories namely: Pyogenic osteomyelitis, infectious arthritis and tuberculous osteomyelitis.

Traditionally the term tuberculosis applied to the infection caused by *Mycobacterium tuberculosis* or *Mycobacterium bovis* but now it has been established that atypical *Mycobacteria* are also responsible for tuberculosis of bone and joints (Karlson 1973; Kelly *et al.* 1963; Krieger *et al.* 1964; Pritchard 1975).

Tuberculosis osteomyelitis tends to arise insidiously and to extend into joint space. The long bone of the extremities and spines are the favoured site of localization (Buranapanitkit, Urm & Kiriratnikom 2001; Peretsmanas & Afonin 2002).

The massive use of antibiotics in clinical therapy is resulting in high incidence of antibiotic resistance among bacteria isolated from patients (Ahmad *et al.* 1987; Almeida *et al.* 2003; Coli 2003).

MATERIALS AND METHOD

In order to collect the clinical material, the patients were attended and diagnosed clinically at the

Table I
Frequency of organism isolated from clinically diagnosed patients of Tuberculosis osteomyelitis

S.No.	Organisms	Number of isolates	Percentage
1	<i>Mycobacterium tuberculosis</i>	04	16
2	<i>Mycobacterium bovis</i>	01	4
3	Atypical <i>mycobacteria</i>	01	4
4	Smear Positive and culture negative	02	8
5	Smear and culture both negative	17	68
	Total	25	100

Table 2
Sites involved in Tuberculous osteomyelitis

S. No.	Site	Frequency
1	Hip	07
2	Knee	04
3	Spine	14
	Total	25

department of Orthopaedics-II Civil Hospital Karachi. The patients attending the O.P.D were selected on the basis of clinical history, symptoms of tuberculous osteomyelitis.

The clinical material obtain from the patient consisted of exudates, pus and joint aspirate in case of arthritis. The clinical material was subjected to the digestion by treating with equal amount of sterile 4% Sodium Hydroxide solution. Contents were shaken for 15 minutes, centrifuged and the supernate was removed. Bromothymol blue (one drop) was added to the sediment and neutralized with 2 N HCl. (Bauer 1982)

Microscopic examination

The clinical material was stained by acid fast staining and observed under the microscope. The staining reactions of the organism were recorded.

Isolation of organism

The clinical material was streaked on Lowenstein Jensen medium and incubated at 37°C for 6 weeks and examined the appearance of growth with interval of two weeks. The identification of organism carried out

on the basis of cultural characteristic and acid fast staining.

Antibiotic sensitivity:

Sensitivity pattern of *Mycobacterium* isolates was determined by incorporating Rifampin and INH in varying concentrations in Lowenstein Jensen medium (Bauer 1982). Slants with and without antituberculous drug were inoculated and incubated. Results were recorded on the basis of absence or presence of growth.

RESULTS & DISCUSSION

The present study includes 25 cases of tuberculous osteomyelitis. *Mycobacterium tuberculosis* was isolated from 4 patients and *Mycobacterium bovis* and atypical mycobacteria from one case each. In 76 % of the cases culture could not be isolated from the patients (Table-1). Other parameters such as patient's history, X – Ray, blood picture etc. were found diagnostic of tuberculous osteomyelitis and patients responded to anti-tuberculous drugs. Failure of isolation from tuberculous osteomyelitis may be due to the limited number of organism in biopsy specimen (Lazzarini et al. 2002; Chadwick 1981). According to Versfeld & Saloman (1982), the area infected by *Mycobacterium tuberculosis* may be extremely limited which may render the isolation difficult. Davies et al. (1984) recovered *Mycobacterium tuberculosis* from 50 % cases and Lifeso et al. (1985) failed to isolate this organism in 48 % case of bone and joint tuberculosis. According to the history of patients the tuberculous osteomyelitis in majority of patients was found to spread from primary focus lungs (Davies et al. 1984; Lifeso et al. 1985). Spine tuberculosis was the most

Table 3
Susceptibility of isolates of *Mycobacterium* species to Rifampin and Isonicotinic acid hydrazine (INH)

Drug	Conc. (µg/ml)	<i>M. tuberculosis</i> (4 isolates)		<i>M. bovis</i> (1 isolate)		Atypical <i>Mycobacteria</i> (1 isolate)	
		S	R	S	R	S	R
Rifampin	1	4	-	1	-	1	-
	2	4	-	1	-	1	-
	4	4	-	1	-	1	-
Isonicotinic Acid Hydrazine (INH)	0.1	4	-	1	-	-	1
	0.2	4	-	1	-	-	1
	0.4	4	-	1	-	1	-

R = Resistant; S = Sensitive

common site in our study (Table-2)

Development of resistance in Mycobacterium species is very low as compared to the other organisms which may be due to the fact that *Mycobacterium tuberculosis* can acquire resistance to drug during therapy: but not transferred as R-factor in the family Enterobacteriaceae (pratt & Fekety 1986). Studies conducted on 3146 isolates of *M. tuberculosis* in the USA during 1975 to 77 shows that 4% isolates were resistant to INH and only 0.3% to rifampin (Pratt & Fekety 1986). In present studies no significant resistance was noted in local isolates of *Mycobacterium* spp. against INH and rifampin (Table-3).

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