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Editorial

DOTS, NTP AND HIV

We have now been running pilot projects on the revised strategy on NTP incorporating 'Directly Observed Therapy-Short-term' (DOTS) in a few selected towns and States for over one year. A fair degree of success is claimed to have been achieved by this strategy although statistical information is not yet available. It is probably time to ponder over how to proceed further, especially with the view that the Revised National Tuberculosis Programme (RNTP) will have to be extended throughout the country. Before we undertake this exercise, it may be pertinent to consider certain basic factors involved.

Firstly, we are now threatened with two rather serious complications affecting the tuberculosis epidemic - Multi Drug Resistance (MDR) and AIDS. Whereas the latter can probably be considered a relatively distant threat, notwithstanding the perceptions of agencies like WHO, based on adelphi projections of the likely number of cases, the former is very much with us. MDR, to put it in simplistic terms, is the product of poor delivery of medicines and poor adherence to treatment regimens, both of which are sought to be addressed by DOTS. AIDS is a menace not only because no sure treatment against it has been found so far but also because, by reducing the number of T cells in the body, the immune mechanism is badly compromised. This, in turn, leads to the reactivation of dormant bacilli, effectively blocked thus far in the infected individuals. Or, in more commonly understood terms, a breakdown in the infected individuals takes place.

There can be no two opinions about the effectiveness of *supervised drug therapy* or, for that matter, any therapy which is adhered to. From times immemorial treatment of diseases was given under the eye of the treating physician, by hospitalisation or in the home through frequent visits. Till the more effective ways of delivering anti-tuberculosis drugs were firmly established, tuberculosis was treated in hospitals and sanatoria, where treatment and life were totally supervised. The results were very encouraging then. Even before antituberculosis drugs were introduced in hospitals and sanatoria, some degree of success used to be achieved with conventional therapy like bedrest and collapse therapy. The limited numbers of hospital beds, and the cost of maintaining them, prompted the quest for a more cost effective alternative, once it was realised that drugs alone could convert an infectious individual into a non-infectious one, to become a useful citizen. In other words, use of drugs alone, without hospital admission, could break the transmission cycle and rehabilitate a patient, a result almost unattainable in the pre-drugs era. Researches at Madras Chemotherapy Centre, and some other centres firmly established that domiciliary chemotherapy could achieve almost the same results as hospital treatment. Here one is tempted to recall what the late Dr. B.K. Sikand had said about domiciliary versus hospital treatment: "When we cannot have the best, viz. hospital treatment, let us go in for the second best". However, in the euphoria of the success of domiciliary chemotherapy, generated by the outstandingly successful trials conducted by Madras Chemotherapy Centre,

these wise words were forgotten and sanatoria started closing down. In other words, supervised treatment just died out.

The National Tuberculosis Programme was evolved as a guideline to rational and effective domiciliary treatment of tuberculosis, with particular emphasis on cutting the transmission cycle, and was based entirely on existing realities of an evolving health services network (itself a remarkable achievement) with which it was to be integrated. Nowhere did this programme envisage jettisoning of existing tuberculosis institutional facilities. Rather, these facilities were to be an integral component of the programme. The health services programme involved, and still involves, an integrated working of all preventive, promotive and curative services. Health education is an important, even basic, component of this programme. Some degree of supervision of curative work is automatically a part of the integrated approach. It was on this aspect that the NTP was based, apart, of course, from the drug treatment that was used.

Where did it all go wrong? Today, we have the dismal picture of incomplete and inadequate, and often irrational, drug treatment of tuberculosis patients. The facilities provided for the control of tuberculosis, theoretically, reach only three fourths of the districts in the country, a sad commentary on our health providers, who still blame patients and the private practitioners for short falls of the programme. To satisfy our conscience, we have now brought in the concept of direct supervision over medication, literally dropping the medicine into the patient's mouth. We have conveniently forgotten our own failures. We allowed various bottlenecks to appear even in the supply of drugs to the user institutions. We failed to integrate the programme with the organised health service, a failing shared by several other programmes. All that we did for the peripheral area, constituting 80% of the target population, was to provide a 'multipurpose' worker to the PHDs. This worker is supposed to collect sputum specimens from a large area, which he is unable to cover in a reasonable time, partly because he is supposed to be available at the headquarters for half the time.

There are over 40 paramedical and auxiliary staff in a Primary Health Centre. If they are allotted specific areas and encouraged to reside in them, they can easily be trained to deliver all preventive, promotive and curative services to the small population they would now be required to serve. DOTS would then become a reality. Regular supervision of these workers, who would become part of the community they serve, would ensure proper monitoring and reporting, obviating the need for frequent visits to the PHI by these workers.

The above presupposes that the health institutions are properly staffed and that drugs reach them in adequate quantities and in time. The DTC would act as a conduit for the drugs to the PHIs and other peripheral curative centres, and would render the necessary specialised and expert care support.

In such a scenario, multi-drug resistance could be reduced. AIDS patients could also be suspected, if the health worker is in frequent, even daily, contact with the members of the community, and can help the frequently ill ones to seek proper medical attention.

Those (few at present) suffering from TB-AIDS or with MDR tuberculosis could, thus, be admitted, whenever necessary in the available hospital beds and more closely monitored by experts who are conversant with the use of drugs. Hospitalisation of such resistant individuals will also facilitate the use of ancillary measures like surgery, collapse therapy etc. We can achieve all this with existing facilities. Only the will is required.

S.C. KAPOOR

COMPARISON OF BRONCHOALVEOLAR LAVAGE FLUID WITH SPUTUM CULTURE IN THE DIAGNOSIS OF SPUTUM SMEAR NEGATIVE PULMONARY TUBERCULOSIS

V.K. Vijayan, C.N. Paramasivan and K. Sankaran

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Summary; Seventy one sputum smear negative, X-ray positive pulmonary tuberculosis patients were studied to assess the role of bronchoalveolar lavage (BAL) fluid culture in comparison with sputum culture for making bacteriological diagnosis. Thirty three patients were bacteriologically proved by sputum culture examination. Of these, 24(73%) had both sputum and BAL fluid specimens positive for *M. tuberculosis*. None had BAL fluid culture positive without sputum culture being positive. Thus, a single BAL fluid specimen cultured for *M. tuberculosis* is not superior to sputum culture in the diagnosis of sputum smear negative, X-ray positive pulmonary tuberculosis.

in PCP^{4,5}, whereas with sputum induction method, the yield was 67%⁶. BAL is a relatively non-invasive and less expensive procedure that can be repeated without major complications and has been extensively used in various interstitial lung diseases⁷. A study was, therefore, planned to evaluate the role of BAL culture in the bacteriological diagnosis of sputum smear negative, X-ray positive pulmonary tuberculosis in comparison with sputum culture.

Material and Methods

The study was approved by the Institutional Ethical Committee and informed consent was obtained from each subject.

Introduction

Fibreoptic bronchoscopy studies that provide various types of specimens (aspirates, brushes and biopsies) for confirming the diagnosis in sputum smear negative pulmonary tuberculosis have yielded conflicting results^{1,2}. Bronchoscopy with bronchoalveolar lavage (BAL) has a high diagnostic yield in *Pneumocystis carinii* pneumonia (PCP) and most other opportunistic or non-opportunistic pulmonary infections especially in patients with acquired immunodeficiency syndrome³. The diagnostic yield of BAL ranged from 84 to 94%

a) Study subjects

Seventy one patients presenting with respiratory symptoms such as cough, fever, hemoptysis and loss of weight, for less than 6 months, and with at least six sputum smears negative results for acid fast bacilli (AFB) but with radiographic appearances suggestive of pulmonary tuberculosis were evaluated by sputum and BAL culture for the demonstration of *M. tuberculosis* over a four-year period. None of the patients had received any anti-tuberculosis treatment. Sputum smear examination was repeated at the time of intake.

The other investigations carried out were Mantoux test with 1TU RT 23 with Tween 80, and a full-size postero-anterior chest X-ray.

b) *Bronchoalveolar lavage*

Bronchoalveolar lavages were obtained with a flexible fiberoptic bronchoscope⁸ from the radiologically abnormal lobe. One hundred millilitres of sterile saline at room temperature was infused in five 20 ml aliquots through the bronchoscope wedged into a subsegmental bronchus. After each aliquot was infused, the fluid was recovered by using suction apparatus and collected in a specimen trap. The specimens were then pooled in a sterile plastic cup and processed for bacteriological examination.

c) *Mycobacteriology*

i) Sputum

Sputum smears were stained by the Auramine Method for AFB scanning. Sputum samples were processed by the modified Petroff's method. Briefly, two volumes of 4% NaOH were added to the bottle containing sputum and shaken by hand for 1 minute and then placed on the shaking machine for 20 minutes. The bottles were then centrifuged for 15 minutes at about 3000 rpm, filled up with about 20 ml of sterile distilled water after the supernatant was poured off, shaken by hand to mix the deposit and recentrifuged for 15 minutes. The supernatant was poured off and one loopful of the deposit was inoculated onto 2 LJ (Lowenstein Jensen) slopes. The LJ slopes were incubated at 37°C and were examined weekly upto 8 weeks for growth of *M. tuberculosis*.

ii) BAL specimens

After preparing smears for staining, and before decontamination, the BAL specimens were inoculated onto one slope each of LJ,

LJ-P (LJ with sodium pyruvate) and Middlebrooke's selective 7H11 medium⁹ as well as the selective Kirschner's liquid medium (SKLM)^{10,11}. The remaining part of the BAL specimen was then decontaminated, using 5% H₂SO₄, and inoculated onto a second set of the same media. All the media were incubated at 37°C. The LJ, LJ-P and selective 7H11 slopes were examined for growth of *M. tuberculosis* for 8 consecutive weeks, but as soon as growth was visible in SKLM, it was centrifuged and the deposit was inoculated onto LJ slopes. The supernatant was then added to the remaining deposit, treated with 4% NaOH and inoculated onto 2 more LJ slopes. If no growth was visible in SKLM at the end of 6 weeks, it was treated with 4% NaOH and inoculated onto 2 slopes of LJ. The LJ slopes were incubated and examined for a further period of 8 weeks.

Laboratory staff involved in the culture of sputum and lavage specimens were not aware of the identity of the specimens and the comparison of sputum and BAL cultures was independent and blind.

Results

Of the 71 patients, 33 had positive cultures of *M. tuberculosis* from sputum. Their mean reaction to PPD was 19.2 5.8 mm (range 10 to 40 mm). All had radiographic abnormalities with exudative pattern confined to one of the upper zones and none had cavitory lesions.

Of the 33 patients, 24 (73%) had both sputum and BAL fluid cultures positive for *M. tuberculosis* and in none was BAL fluid positive without sputum being positive (Table). Thus, the yield from BAL fluid was only 73% of that by sputum culture examination. In only three patients was BAL smear positive and in these patients sputum and BAL cultures were also positive.

Table Comparison of *M. tuberculosis* results from BAL and sputum in smear negative, X-Ray positive pulmonary tuberculosis

BAL	SPUTUM		
	Positive	Negative	All
Positive	24*	0	24
Negative	9	38	47
All	33	38	71

*BAL Smear also Positive : 3

Discussion

Patients with chest radiographs compatible with tuberculosis but a negative sputum smear present a dilemma (to treat or not to treat for tuberculosis) to chest physicians. It has been reported that 74% of such patients progress to active tuberculosis within five years, if left untreated¹². For confirming the diagnosis in sputum smear negative pulmonary tuberculosis cases, fiberoptic bronchoscopy specimens (washings, brushes and biopsies) and post-bronchoscopy sputum examination have been used¹³. However, the most useful bronchoscopy specimen that will confirm the largest numbers among smear negative pulmonary tuberculosis cases has yet to be established^{14,15}.

Wallace et al¹⁶ demonstrated that bronchoscopy specimens submitted to culture had a lower yield (10 of 23) of *M. tuberculosis* than pre-bronchoscopy sputum specimens (14 of 21). But, Baughman et al¹⁷ reported that of 30 patients whose pre-bronchoscopy sputum was negative for AFB, bronchoscopy specimens were smear positive in 26 (87%) and culture positive in 9 (3%).

In the present study, out of a total of 71 suspected patients, pre bronchoscopy sputum

culture was positive in 33 (46.5%), while BAL fluid culture was positive only in 24 (34%), in whom sputum cultures were also positive. In none was tuberculosis diagnosed by BAL fluid culture alone, despite the use of several different culture media, whereas sputum was cultured only on LJ medium. Similar findings have been reported by Kennedy et al¹⁸. Sputum smear negative pulmonary tuberculosis is a paucibacillary condition and the dilution of epithelial lining fluid by the instilled saline might be responsible for the low yield from BAL specimens. In addition, the local anesthetic used for bronchoscopy might have also suppressed the growth of *M. tuberculosis*¹⁹. Kennedy et al¹⁸ had further observed that confirmation among sputum smear negative pulmonary tuberculosis was possible in 38% of patients, if all the different bronchoscopic procedures such as transbronchial biopsy and post-bronchoscopy sputum in addition to BAL were studied. Are the rest who remain unconfirmed potential future cases of sputum positive pulmonary tuberculosis or some of them non-tuberculous? New diagnostic techniques such as measurement of the humoral response to various mycobacterial antigens and the detection of *M. tuberculosis* DNA by polymerase chain reaction are, therefore needed²⁰.

In conclusion, the results of this study indicate that a single bronchoscopic procedure such as bronchoalveolar lavage fluid culture may not be superior to sputum culture examination.

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IN VITRO ACTIVITY OF OFLOXACIN AGAINST CLINICAL ISOLATES OF *MYCOBACTERIUM TUBERCULOSIS**

N.K. Jain¹, B.B. Surpal², S.P. Khanna³ and T. Fatima⁴

Summary: The MIC of Ofloxacin was 2 µg/ml against the standard *M. tuberculosis* H37Rv strain. The mean MIC was 2.04 µg/ml against 167 clinical isolates of *M. tuberculosis*, sensitive to all the drugs while it was 2.00, 2.09 and 2.16 µg/ml against isolates resistant to various antituberculosis drugs. The nine isolates from patients suffering from drug-resistant tuberculosis and taking Ciprofloxacin were resistant to both Ciprofloxacin and Ofloxacin. The isolates from 7 patients who had been taking Ofloxacin were sensitive to both, the drugs while two isolates from patients taking Ciprofloxacin and/or Ofloxacin were resistant to both the drugs. Ofloxacin seems to be bactericidal *in vitro* at 4 to 8 µg/ml concentration which is lower than the serum peak concentration achievable with the therapeutic dose. These findings indicate that Ofloxacin is a very potent drug *in vitro* and it needs controlled clinical trials before use in drug resistant tuberculosis. There seems to be a great degree of cross-resistance among various derivatives. Therefore, there is need for studies with the other quinolones.

Introduction

There is a renewed interest in the quinolones class of antimicrobial agents during the last few years and many new synthetic fluoroquinolones (Norfloxacin, Pefloxacin, Ofloxacin, Qprofloxacin, Lomefloxacin, Sparfloxacin, and Enoxacin) have been found to be very potent with broad spectra

of activity, including mycobacteria'. Many of these new compounds, particularly Ofloxacin, show high activity against *M. tuberculosis*; they penetrate the mammalian cells and are bactericidal^{2,6}. However, the need for new antimycobacterials is much greater today than ever, due to the resurgence of tuberculosis in many countries and development of drug resistance against the most effective drugs, Isoniazid and Rifampicin^{7,9}. The present study was undertaken to determine the minimal inhibitory concentration (MIC) of Ofloxacin against sensitive and resistant clinical isolates of *M. tuberculosis* and to find out whether the drug is bactericidal or bacteriostatic, *in vitro*.

Material and Methods

Cultures : A total of 304 strains of *M. tuberculosis* isolated from as many patients attending the New Delhi Tuberculosis Centre were tested. None of these patients had taken Ciprofloxacin or Ofloxacin during their treatment. All these isolates were identified as *M. tuberculosis*. They included 167 strains sensitive to the drugs Isoniazid (H), Rifampicin (R), Ethambutol (E), Streptomycin (S), and Thioacetazone (T); 52 strains were resistant to H only, 48 resistant to H and R while 37 were resistant to H,R, and other drugs but not Ciprofloxacin and Ofloxacin. The standard strain of *M. tuberculosis* (H37Rv) was always included in the tests as control. Included in the study were 9 isolates from patients who had taken

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1. Bacteriologist 2. Ex-Director 3. Director, New Delhi Tuberculosis Centre, New Delhi 4. Reader, Department of Biosciences, Jama Milha Islamia University, New Delhi

Correspondence: N.K. Jain, Bacteriologist, New Delhi Tuberculosis Centre, J.L. Nehru Marg, New Delhi-110002

Ciprofloxacin for more than 3 months along with other anti-tuberculosis drugs, 7 from patients who were on Ofloxacin for a period of 1-2 months and 2 from patients who had taken both Ciprofloxacin and Ofloxacin for varying periods.

Drug concentrations used : Ofloxacin (Ranbaxy Ltd., New Delhi) and Ciprofloxacin (Cadilla dab., Ahmedabad) were incorporated in the medium (Lowenstein Jensen) to give final concentrations of 0.5,1,2,4,8,16 ug/ml for MIC determination

Sensitivity: All the cultures were maintained on LJ medium. A standard suspension was prepared and inoculated on one drug-free and one set of drug-containing LJ slopes (different concentrations) with the help of a 3 mm wire loop. After inoculation, the media bottles were incubated at 37°C for four weeks. The MIC was determined as described by Canetti et al¹⁰ using the 20-colony end point.

Determination of bactericidal activity : The bactericidal activity was determined in 7H9 broth. The H37Rv was cultured in 7H9 broth (Difco Lab., USA). The colony forming units (CFU) were determined by plating various dilutions on LJ/7H10 agar plates. A total of 13.2×10^5 CFU (100 ul) were inoculated in 7H9 broth tubes (triplicates) containing various concentrations of Ofloxacin i.e., 2,4,6 and 8 ug/ml. The tubes were incubated at 37°C. After every 24 hours, 10 ul broth from each tube was taken and made into serial dilutions 10^1 to 10^4 for seven days and cultured on LJ slants. The slants were incubated and the reading was taken after four and eight weeks. The colonies were counted and mean of the triplicates was taken.

Results

MIC of Ofloxacin for *M. tuberculosis* H37Rv, tested on seven occasions was 2 ug/ml on all occasions. The mean MIC was 2.04 ug/ml for

sensitive strains, 200 ug/ml for H resistant strains, 2.09 ug/ml for H & R resistant strains and 2.16 ug/ml for strains resistant to H,R and other drugs (Table 1). The mean MIC for all the strains taken together was 2.07. None of the strains was resistant to 8 ug/ml or more. A total of 84 isolates were sent to Tuberculosis Research Centre, Chennai where 40 cultures were tested for drug susceptibility against Ofloxacin and good concordance was found between the two laboratories.

Table 1: MIC of Ofloxacin against clinical isolates of *M. tuberculosis*

Sensitivity Status	No. of strains	MEC				MeanMC
		0.5	1.0	2.0	4.0 ug/ml	
Sensitive to H,R,E,S&T	167	1	13	142	11	2.04
Resistant to H only	52	-	8	40	4	2.00
Resistant to H & R	48	-	6	37	5	2.09
Resistant to H, R & others	37	-	4	28	5	2.16
Total	304	1	31	247	25	2.07

H-Isoniazid, R-Rifampicin, E-Ethambutol, S-Streptomycin, T-Thioactazone

Table 2 shows the pattern of sensitivity of *M. tuberculosis* isolates from patients who had taken or were taking Ciprofloxacin and/or Ofloxacin. All the nine isolates from patients who were on Ciprofloxacin were resistant to both Ciprofloxacin and Ofloxacin (> 8 ug/ml). The seven isolates from patients who were taking Ofloxacin for 1-2 months were found to be sensitive to both Ciprofloxacin and Ofloxacin and the two isolates from patients who had history of taking Ciprofloxacin as well as Ofloxacin for unknown periods were found to be resistant to both the drugs (> 8 ug/ml).

Table 2: Sensitivity pattern of clinical isolates of *M. tuberculosis* from patients taking Ciprofloxacin and/or Ofloxacin

No. of Strains	Ciprofloxacin		Ofloxacin	
	Sensitive	Resistant	Sensitive	Resistant
9		9		9
7	7		7	
2		2		2

Minimal bactericidal concentration (MBC) is the lowest concentration of drug that kills more than 99.9% of the bacterial population after the drug is added. Figure 1 clearly shows that 8 ug/ml killed all the bacteria by 6th day, while 4 and 6 ug/ml concentration of Ofloxacin were bactericidal by 7th day, in vitro. There was a significant reduction in the CPUs with 2 ug/ml Ofloxacin by the 7th day.

Discussion

In the 1970s, there was a big hope that tuberculosis would be controlled effectively with the availability of potent drugs. But after almost 25 years of availability of good drug regimens, the tuberculosis situation has even worsened in the developing countries¹¹ mainly due to poor control programmes and due to HTV infection in the developed countries¹², resulting in the so called "third epidemic" i.e., multi-drug resistant tuberculosis¹³. It is this third epidemic which has created an urgent need for newer drugs. The drug Ofloxacin was chosen for investigation because of reports of its effectiveness against mycobacteria¹ and its well established pharmacokinetics^{14,15}. Moreover, Ofloxacin is freely available and is being extensively used in India.

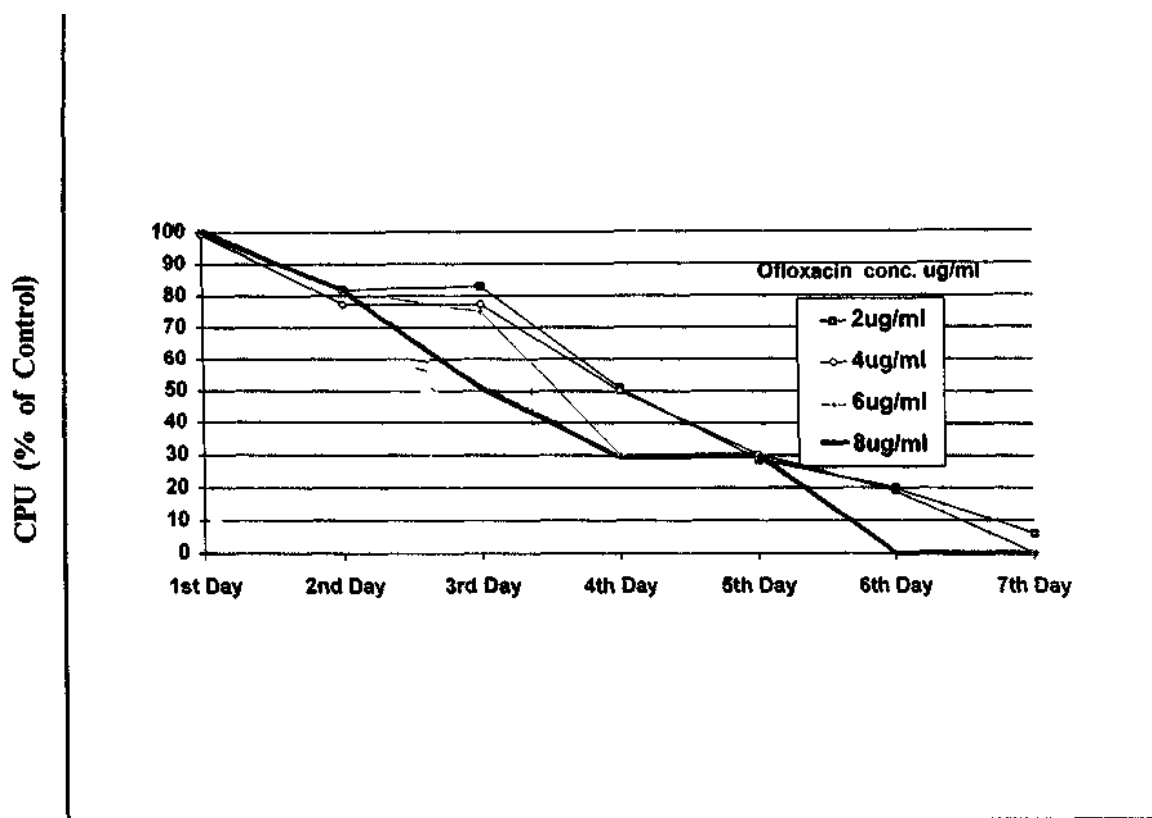


Fig. 1. Bactericidal Activity of Ofloxacin (in vitro)

The MIC of Ofloxacin is quite low compared with the achievable serum concentration (10.7 ug/ml after 600-800 mg/daily, orally) and to Ciprofloxacin (2-3 ug/ml)¹⁵. Ofloxacin has been reported to be very active against *M. tuberculosis*². The findings from the present study are very promising, as the MIC is almost the same for sensitive as well as resistant clinical isolates of *M. tuberculosis* (resistant to the usual anti-tuberculosis drugs, but not to Ciprofloxacin and Ofloxacin) and the overall geometric mean MIC is 2.07 ug/ml which is almost the same as that for the standard strain. Two studies carried out in India have reported similar findings^{16,17}. The present study also suggests that there is no cross resistance with other anti-tuberculosis drugs, though there seems to be a high degree of cross-resistance between Ciprofloxacin and Ofloxacin. It is also possible that there is a high degree of cross-resistance between different derivatives of quinolones. Therefore, further studies on this subject are necessary.

The present study suggests that Ofloxacin being bactericidal *in vitro* at a much lower concentration than the achievable serum concentration, can be very useful for treating drug resistant tuberculosis. Rastogi and Goh¹⁸ have also reported the bactericidal property of Ofloxacin.

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200	Title of the Article	<i>IN VITRO</i> ACTIVITY OF OFLOXACIN AGAINST CLINICAL ISOLATES OF <i>MYCOBACTERIUM TUBERCULOSIS</i>*
201	Journal Title	INDIAN JOURNAL OF TUBERCULOSIS
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MYCOBACTERIOLOGICAL STUDY OF FINE NEEDLE ASPIRATES IN CERVICAL LYMPHADENITIS

M.P. Verenkar, Kavita Kamath, W.M.J. Pinto. S. Rodrigues and R.G. Wiseman Pinto

(Original received on 11-4-94; Revised version received on 27.2.96: Accepted on 11.4.96)

Summary: Material obtained by fine needle aspiration cytology (FNAC) technique from 80 cases of clinically suspected tuberculous lymphadenitis, attending various Out-Patients' Departments of Goa Medical College were subjected to cytopathological and bacteriological examinations.

Culture positivity was seen in 20 cases (25%) while in 10 (12.5%) acid fast bacilli could be demonstrated by Ziehl Neelsen's technique. All the 20 culture isolates were identified and classified as *Mycobacterium tuberculosis* (human type).

Correlation with cytopathological findings showed that 19 of 36 (52.77%) cytopathologically confirmed case and 1 of 5 (20%) cases of granulomatous lymphadenitis (non-tuberculous by cytology) yielded growth of mycobacteria.

Thus FNAC is a safe, quick, reliable and cost effective procedure, helping in the diagnosis of tuberculous lymphadenitis with a high degree of accuracy.

Introduction

Tuberculosis has been and is a great problem throughout the world, especially in a developing country like India. Besides pulmonary tuberculosis, extra-pulmonary manifestations are

relatively more common among the Asian populations, the most common being lymphadenitis, particularly in the cervical region¹.

The diagnosis of tuberculous lymphadenitis is mostly clinical, and wherever facilities are available, by histopathological evidence after surgical biopsy.

Fine needle aspiration cytology (FNAC), however, can often settle the diagnosis, in well defined situations and organs. This procedure avoids the occasional physical and psychological trauma, general or local anaesthesia, surgical operation and hospitalisation. It is a simple, safe, cost effective and, at the same time, conclusive procedure².

Other diseases such as sarcoidosis, brucellosis and cat scratch disease may also give rise to lymphadenopathy with a similar histopathological picture. Therefore, it is necessary to identify the causative agent for clinching the diagnosis and proper management of such cases^{3,4}.

This study was undertaken to evaluate the usefulness of fine needle aspiration technique for the said bacteriological examination by both smear and culture of lymphnode aspirates from clinically suspected cases of tuberculous lymphadenitis. An attempt is also made to correlate bacteriological results with cytopathological findings.

Material and Methods

Eighty patients suspected to be having tuberculous lymphadenitis by the various Out-Patients' Departments of Goa Medical College, from July 1991 to December 1991, formed the study material.

All the patients were evaluated clinically (routine hemogram with ESR, X-ray chest and Mantoux test). Fine needle aspiration was then done as per the technique described by Orell et al⁵, using a 10 ml sterile syringe fitted with a 23 gauge needle, one and a half inches long. Smears were then made from the material and stained with :

- (1) Haematoxylin and Eosin stain for cytological examination.
- (2) Ziehl Neelsen stain technique for acid fast bacilli. A part of the material was then put into sterile test tubes normal saline and subjected to culture without decontamination on 2 Lowenstein Jensen (LJ) slopes. Both the slopes were incubated at 37°C for 8 weeks. Any growth was subjected to smear examination by Ziehl Neelsen's staining method.

Growths found to be positive for acid fast bacilli were identified on the basis of various culture and biochemical characteristics viz., (1) rate of growth, (2) growth at room temperature, and at 45°C, (3) pigments production. (4) catalase and peroxidase tests, (5) niacin test and (6) growth in paranitrobenzoic acid medium (PNB).

Results

Acid fast bacilli could be demonstrated in 10 cases the smear positivity rate being 12.5%. Culture positivity was seen in 20 cases (25%). All the smear positive cases were also culture positive (Table 1). All the isolates were identified as *Mycobacterium tuberculosis* (human type).

Table 1 : Bacteriological findings in 80 cases under study

No. of cases	Smear results		Culture results	
	Positive	Negative	Positive	Negative
80	10	70	20	60
Percentage	12.5%		25.0%	

Cytopathological findings in these 80 cases revealed 4 sub groups as shown in Table 2. Majority of the cases of lymphadenitis were of tuberculous origin (36/80; 45%) or showing chronic non-specific lymphadenitis (37/80; 46.25%).

Table 2: Cytological & bacteriological correlation of cervical lymphadenitis cases

Group	Cytologic Features	No. of Casts With Percentage	AFB Smear Positivity	AFB Culture Positivity
I.	Tuberculous lymphadenitis	36 (45.00%)	10 (27.77%)	19 (52.77%)
II.	Granulomatous lymphadenitis	5 (6.23%)		1 (20.00%)
III.	Chronic non-specific lymphadenitis	37 (46.25%)		
IV.	Malignancy	2 (2.50%)		

Table 2 also shows the correlation of cytopathological findings of these various groups with bacteriological findings. Culture positivity was 52.7% (19 out of 36) in cases cytologically showing tuberculous lymphadenitis. One culture positive case was found in the 5 granulomatous lymphadenitis cases (non tuberculous on cytology). None of the cases of chronic non-specific lymphadenitis or malignancy were positive by culture.

Discussion

Tuberculosis being common in our country, it is not surprising that tuberculous lymphadenopathy continues to be one of the commonest causes of chronic lymph node enlargement

Pamra et al⁶ reported that dependence on clinical evidence alone would lead to erroneous diagnosis in a considerable number of lymphadenitis cases. Hence, other investigations like cytopathology or histopathology, along with bacteriology become necessary to confirm the diagnosis of tuberculosis.

Although histopathological study of the resected lymph node is dependable, the disadvantages of this procedure are well known. Fine needle aspiration cytology in the diagnosis of tuberculous lymphadenitis, however, is simpler, safe, cost effective and, at the same time, conclusive².

The smear positivity rate (12.5%) in our study was relatively low, probably due to only one staining technique used. Fluorescent staining along with Ziehl Neelsen method could have improved the smear positivity rate. The smear positivity rate among the cytologically diagnosed cases was 27.77% (10 out of 36).

Culture isolation of mycobacteria was better in our study (25%). Positive cultures are usually obtained in only 30-50% of all such cases⁷. This may be due to the low number of organisms in lymphnode lesions. In addition, natural healing process, previous antituberculosis treatment and unrepresentative specimens of the lymph node material used for culture can all account for more negative cultures. Grange et al¹ reported that culturing of pus rather than the tissue may not show growth, as the bacilli in pus are already killed by free fatty acids. These reasons may explain the failure to obtain growth of mycobacteria in some of our cases.

A correlation with cytopathological examination revealed culture positivity of 52.77% in cases cytologically suggestive of tuberculous lymphadenitis. And our culture results are comparable to isolation rate of mycobacteria from lymph node tissue obtained by open biopsy by other workers⁶. Since 55% of our cases were found non-tuberculous in origin, clinical suspicion alone should not be a criterion to start the patient on specific treatment.

All our culture isolates were identified as human type, indicating that *Mycobacterium tuberculosis humanis* is still the most common cause of tuberculous lymphadenitis in India. Occurrence of lymphadenitis due to infection by mycobacteria other than typical tubercle (MOTT) bacilli has been reported from other parts of the world, where tuberculosis has declined and the relative frequency of mycobacteria other than typical tubercle has risen, especially in immunodefective individuals⁸.

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RESPONSE OF HIV SEROPOSITIVE TUBERCULOUS PATIENTS TO SHORT COURSE CHEMOTHERAPY*

B.N. Panda, S.C. Tewari, P.N. Arora, J. Jena, S.K. Nema and R. Jayaswal

Summary: Between March 1991 and March 1995, 59 HIV seropositive patients with tuberculosis were treated with fully supervised short course chemotherapy comprising 2SHRZ/

EHRZ followed by 4-7 month RH on daily basis. Eighteen patients had only pulmonary tuberculosis, 13 patients had only extra pulmonary tuberculosis, and 28 had both pulmonary and extrapulmonary tuberculosis. All these patients showed excellent therapeutic response initially. However, 11 patients died, and in eight cases the total outcome could be ascribed to parasitic and fungal infections, INH resistance was observed in only one case. Drug intolerance was seen in 3 cases.

lent bactericidal drugs⁹. The present study analyses the response in HIV seropositive patients of tuberculosis to SCC.

Material and Methods

The material comprises 59 HIV seropositive patients who were diagnosed to be suffering from tuberculosis from amongst 404 HIV seropositive patients hospitalised during the period March 1991 to March 1995. All service personnel found positive for HIV by ELISA method and confirmed by Western Blot technique or supported by another ELISA reading from a different laboratory were screened for evidence of any tuberculous disease. Diagnosis of tuberculosis was based on clinical findings with evidence of pulmonary or extra pulmonary involvements further confirmed by demonstration of acid fast bacilli (by smear/culture) in sputum, body fluid or aspirate from various organs with or without histological or cytological support provided by demonstration of granulomatous lesions and even therapeutic response to SCC.

These patients were treated with 2 SHRZ/ 2 EHRZ followed by 4-7 months of continuation phase therapy with RH in dosages recommended by WHO⁹. Till December 93, 22 patients were treated with 6 - month regimen but after January 1994, the remaining 37 were given 9 months' SCC.

Introduction

Human immune-deficiency virus (HIV) infection has added a totally new dimension to the world tuberculosis scenario^{1,2}. Today, HIV remains the most significant risk factor for progression of latent *M tuberculosis* infection to active tuberculosis^{3,5}. The dual epidemic of HIV and tuberculosis has stalled the elimination of tuberculosis from the Western countries and has reversed the gains of tuberculosis control programmes in the third world countries^{6,8}, despite the universal acceptance of short course chemo-therapy (SCC) and availability of excel-

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Military Hospital Cardio-Thoracic Centre, Pune and Command Hospital, Southern Command, Pune.

Correspondence : Lt Col B.N. Panda, Military Hospital, Cardio-Thoracic Centre, Pune-411040.

Results

There were 59 adult male patients in the age group 20-52 years (Average 32.8 yrs.), most of them between 30 to 40 years old (Table 1). Out of them, 55 patients had HIV-1 infection and 2 each had HIV-2 & HIV-1 and 2 both. Exclusive pulmonary tuberculosis was noted in 18 patients whereas pulmonary involvement was associated with extra-pulmonary disease in 28 patients (78% of cases) and 13 patients had extra pulmonary involvement only. The average age of patients with pulmonary disease was more compared to those having extra-pulmonary involvement (Table 2).

Table 1 : Age distribution and fate of HIV positive TB patients

Age (yrs.)	Total patients	Completed treatment	Died during treatment	Died during follow up
<20	1	1	-	-
21-30	26	20	4	2
31-40	22	17	5	2
41-50	9	8	1	1
51-60	1	-	1	-
Total	59	46	11*	5

*Excludes two cases leaving hospital against advice.

Table 2 : Comparisons according to type of tuberculosis in patients with HIV

	PTB (n=18)	EPTB (n=13)	PTB+EPTB (n=28)
Age (average) in yrs	34.5	32.2	32.5
Treatment completion	16/18 (88.8%)	11/13 (84.6%)	20/29 (67.8%)
Follow up* (months)	12.8	8.4	8.5

* Deaths excluded

PTB = Pulmonary Tuberculosis
EPTB = Extra-pulmonary Tuberculosis

Tuberculosis patients with HIV infection had less often cavitory disease and sputum positive status. Hilar adenopathy and pleural and pericardial effusions were more commonly associated with HIV positive status. Extra-pulmonary disease and multi organ dissemination, like concomitant hepatosplenomegaly were also more often associated with dual infection with HIV & TB (Table 3).

Table 3: Comparison of disease pattern and response to SCC between HIV positive and negative patients who completed treatment

	Patients	
	HIV+VE (n*46)	HIV-VE Negative (n=200)
Average age	30.2 years	29.6 years
Sputum +VE	11 (23.9%)	95 (47.5%)
Cavitory disease	4 (8.7%)	46 (23%)
Miliary TB	2 (4.3%)	6 (3%)
Hilar Glands	15 (32.6%)	7 (3.5%)
PI. effusion	6 (13.0%)	8 (4%)
Pericardial effusion	3 (6.5%)	1 (0.5%)
Ext. Thor. lymph nodes	9 (19.6%)	2 (1%)
Hepatosplenomegaly	5 (10.9%)	2 (1%)
Hepatomegaly	2 (4.4%)	5 (2.5%)
Ocular involvement	2 (4.6%)	2 (1%)
Multiple site of EPTB	10 (21.7%)	4 (2%)
Response to SCC	Good	Good

Good implies sputum conversion by culture

Forty six patients completed SCC. Two patients who deserted the sanatorium and 11 who expired during the chemotherapy⁹ had both pulmonary and extra-pulmonary disease. Sputum conversion occurred in 9 patients in 4 weeks in 2 more by 6th week and all the 46 patients by 8th week of initiation of SCC. INH resistance was recorded in one patient. Three patients had intolerance to various drugs, two to Pyrazinamide and one to Rifampicin. The whole group could

be followed up for an average of 11.6 months. Five died during the followup (Table 1).

Response to Treatment

Response to SCC was good in all these patients except 2 who expired within 8 weeks of starting SCC and the 2 who absconded. Both the patients who died had multi-organ involvement. In one, *M. Tuberculosis* was grown from bone marrow aspirate whereas the other had pleuro-pulmonary TB with mucosal candidiasis. However, 9 more patients deteriorated due to other reasons between 4-6 months of SCC. The association of disseminated fungal/parasitic infection could be proved in 8 of them. (5 Cryptococcosis, 1 Toxoplasmosis and 2 *Pneumocystis carinii*). Both the cases with HTV-2 infection only were maintaining good health 12 to 24 months after completion of SCC. There were more cases having extrapulmonary involvement and hilar adenopathy in cases of pulmonary tuberculosis who had HIV seropositive status compared with the group of 200 consecutive tuberculosis patients treated between January and April 1994 who were HIV seronegative (Table 3).

Cause of Death

Five patients developed cryptococcus infection and succumbed after 4 to 5 months of SCC, though initially there was good clinical response with considerable radiological clearance. One more case had serological and CT scan evidence of CNS toxoplasmosis developing 4 months after SCC. One case relapsed after 36 months of SCC and another who had defaulted during continuation phase developed CNS dissemination. One case died from TB meningitis within six weeks of initiation of SCG. Four cases had *pneumocystis carinii* pneumonia (PCP), of which two were proved on postmortem needle aspiration biopsy. These two did not respond to therapeutic dosage

of cotrimoxazole therapy. The majority (9/11) showed fast deterioration and died after initial improvement

Discussion

Tuberculosis is one of the most common and important pulmonary complications among HIV infected persons^{1,3-14}. World Health Organisation had estimated in early 1992 that there were 4.00 million adults in the world who were dually infected with HIV and tuberculosis. The dual epidemic of HTV infection and tuberculosis has definitely increased the problems of the control programmes of tuberculosis in the developing countries²⁻¹¹. In African countries, tuberculosis was found in 1/3rd of persons infected with HTV. In our country, data about tuberculosis among those found seropositive in regular surveillance of HTV positives are not available. However, in the Armed forces where HTV testing is carried out once in 6 months, the proportion of tuberculosis among seropositives was 14.6% (59/404). Our figure is comparable to data from Mexico¹¹.

The pattern of disease observed in our study showed a definite difference, with lower sputum positivity (Table 3), less cavitory disease and higher proportions of extra pulmonary involvement, of somewhat different from the findings. Mohanty⁴ and Arora¹². Dual infection of HIV and TB has mostly been found associated with HIV 1 but in our series two cases each were also found to be having HIV 2 and HTV 1&2. This indicates that HIV 2 strain has already arrived in our country. It is worth noting that our cases of HIV 2 infection have done well after SCC and are surviving.

There has been an increase in smear negative and extra-pulmonary disease in African HIV positive TB patients¹⁻¹¹ and the same finding has emerged from our study. Global control of tu-

berculosis aims at reducing the mycobacterial burden and 6 months' short course chemotherapy has been an accepted norm^{9,13}. However, final recommendation regarding treatment regimens in HIV infected patients of tuberculosis remain to be standardized^{1,4,5,12,13}.

In the present study, response to SCC has been very good for first 4 months except in 2 cases. Rapid deterioration later in some cases, therefore, was possibly caused by super-added opportunistic infections. The commonest fatal infection has been that of disseminated cryptococcosis. The other common fatal infection was PCP in two patients. The cause of death in 5 cases who died at their home stations could not be decided. We could prove occurrence of PCP pneumonia in 2 by demonstration of causative organism in one and excellent therapeutic response in another. Drug resistance has not been encountered more than many observations reported from the West^{1,5,7}. Drug intolerance was observed in 3 cases, having dual infection of HIV & TB, and in one case of Rifampicin intolerance, SCC had to be prolonged for one year.

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HEALTH SEEKING BEHAVIOUR, ACCEPTABILITY OF AVAILABLE HEALTH FACILITIES AND KNOWLEDGE ABOUT TUBERCULOSIS IN A TRIBAL AREA

K. Jagga Rajamma¹, D. Vijaya Baskara Rao², A.S.L. Narayana³, Rajeswari Ramachandran⁴ and R. Prabhakar⁵

(Original received on 28.2.95; Revised version received on 19.7.95; Accepted on 11.10.95)

Summary: A study was undertaken among the tribals living in Buttayagudem Mandal consisting of 53 villages in West Godavari districts of Andhara Pradesh to study their health seeking behaviour, acceptability of available health facilities and knowledge about tuberculosis. Information was also obtained on their practices to get relief from illness and type of health facilities used. In all, 429 households belonging to 34 villages were selected at random and the heads of these households or the next responsible persons were interviewed. A total of 189 (44%) had heard of tuberculosis and of these, 72 (38%) attributed it to tubercule bacilli. A majority of the tribals were in favour of modern medicines and accepted the available health facilities.

Introduction

Tribal communities are different from other communities because of their traditional cultural background. The health care problems of tribals are more because of illiteracy, widely spread communities, poor sanitation in some areas and their customs and traditions. A number of welfare measures are undertaken by Government of India to improve general welfare, including health, in tribal communities. Despite this, there is a general belief that tribals are still following

traditional methods of dealing with their health problems. So far, very few studies have been reported on tribal health care and health practices followed by tribals.¹⁻³ Hence, Tuberculosis Research Centre (TRC), Chenpai (Madras) the conducted a study regarding health seeking behaviour, acceptability of available health facilities and knowledge about tuberculosis in a tribal area situated in Andhra Pradesh.

Study area and population

The study was conducted at Buttayagudem Mandal in West Godavari district in Andhra Pradesh. There are 53 villages with a total tribal population of 27,841 in this *mandal*. Of these, 34 villages with a population of 18,000 were randomly selected. These villages are predominantly inhabited by tribal communities.

A total of 429 households in these villages were selected at random for the study. The heads of these households or the next responsible persons were interviewed by using a structured interview schedule.

The school teachers of Integrated Tribal Development Agency (ITDA) were trained by the Centre's staff in filling up the interview schedules and utilized to visit the tribals' homes to fill up the schedules which were checked on a sample basis by the TRC team. These teachers were

1. Social Worker; 2. Statistical Assistant, ICMR, West Godawari district; 3. Senior Technical Officer; 4. Assistant Director; 5. Director, Tuberculosis Research Centre, Chetput, Madras-600031.

Correspondence : Mrs. K. Jagga Rajamma, Social Worker, Tuberculosis Research Centre, Spur Tank Road, Chetput, Madras-600031.

familiar to the tribals and were accepted by them

Buttayagudem Mandal has a varied landscape with scattered hills covered with dense forests (Figure). Minor streams meander through the area. It is a difficult terrain as there are no proper roads to the villages and quite a few have to be reached on foot. Very few places are reached by bus and health personnel find it difficult to reach the villages.

The majority of the tribals in this area are Koyas and Konda Reddys who live in the densely covered forest area. Konda Reddy tribe is the most primitive, having immigrated generations back from Srikakulam district of Andhra Pradesh, and the other tribals are Lambadi/Sugali, Yerukala, Chenchula, etc.

Results

Of the 429 tribal respondents, 227 (53%) were males and the age varied from 20 to 76 years; 73% were from 26 to 55 years age group; 288 (67%) were illiterate and 368 (86%) were involved in agricultural work, earning a monthly income of Rs. 500 or less (Table 1). As regards the reasons for sickness, 261 (61%) of the respondents believed in superstitions such as God's

curse, evil spirits, sin, etc; 78 (18%) said that the use of fertilizers and pesticides was the cause of sickness; 46 (11%) had mentioned unhygienic conditions as the reason and the remaining 44 (10%) implicated change of food habits (Table 2).

Table 1: *Demographic characteristics of tribal respondents*

	Respondents	
	No	%
Sex		
Male	227	53
Female	202	47
Age (Years)	90	21
<25		
26-40	231	54
41-55	84	20
>55	24	6
Education		
Illiterate	288	67
Literate	141	33
Occupation	368	86
Agriculture	18	4
Small business		
Casual labour	43	10
Total	429	100

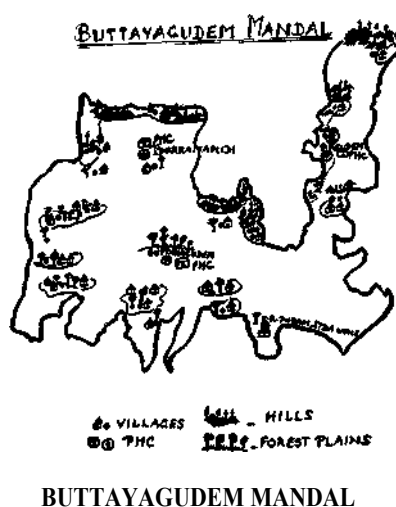


Table 2: *Reasons given for sickness*

	<i>Respondents</i>	
	<i>No.</i>	<i>%</i>
Superstitious beliefs	261	61
Use of fertilizers and pesticides	78	18
Unhygienic conditions	46	11
Change of food habits	44	10
Total	429	100

When the respondents were questioned as to whether or not sick persons should be hospitalised, 310 (72%) said that they should be kept in the hospitals, if there is any need; 265 (62%) felt that they should not marry and 369 (86%) stated that they could do light work, depending upon the severity of the sickness (not tabulated).

As regards the availability of health facilities in this area, 216 (50%) mentioned government health facilities and personnel from there such as Multi Purpose Worker (MPW), Health Inspector, Doctor, etc., 198 (46%) mentioned of non-governmental health facilities such as private doctor, private clinic or hospital and the remaining 4% had no answer to give. The private doctors included unregistered medical practitioners (quacks) who visit the villages on bicycles and give symptomatic treatment to the sick person (not tabulated).

It was observed that 355 (86%) had approached the available health facilities for getting relief. Indigenous and own medicines seemed to be out of favour, since only 24 (6%) of the respondents resorting to such remedies, and 53 (13%) resorted to faith healing for getting relief from sickness (Table 3).

Table 3: *Health sources attended by the tribal community when they fell sick**

	<i>Respondents</i>	
	<i>No.</i>	<i>%</i>
Health facilities (modern medicine)	355	86
Faith healing	53	13
Tribal leaders	21	5
Others (indigenous medicine, home remedies)	24	6
No. of respondents	413	-
Not answered	16	4
Total respondents	429	-

*More than one answer was given by a few respondents.

A total of 379 (88%) of the tribal respondents were aware of home visits by health personnel and 373 (87%) mentioned that their services were useful to their communities and 312 (73%) approached the health personnel at the time of need. Majority of them preferred injections and tablets when they attended Government Health Centres (not tabulated).

Regarding awareness of tuberculosis among these tribals, 240 (56%) had not even heard of tuberculosis. Of the remaining 189 (44%) who had heard of tuberculosis, the causes of the disease were as that by germs mentioned by 72 (38%), by heredity, 49 (26%), by poverty, 22 (12%) and 46 (24%) attributed it to superstitious beliefs (Table 4).

Table 4: Knowledge about causes of tuberculosis among those aware of TB

	Respondents	
	No.	%
Aware of TB	189	44
Germs	72	38
Heredity	49	26
Poverty	22	12
Superstitious beliefs	46	24
Total with knowledge		
Of courses of TB	189	100

About the prevalence of tuberculosis, 102 (54%) said that it was prevalent in rural areas, while 57 (30%) were of the opinion that it was more prevalent in urban areas, whereas the remaining 16% had no idea about the prevalence of the disease. Regarding knowledge of the symptoms of tuberculosis among the persons who had heard of TB, cough was considered to be the main symptom by 73 (39%), haemoptysis by 38 (20%), cough, fever chest pain and haemoptysis combined by 34 (18%) and 15 (8%) had no idea about symptoms (Tables).

Table 5: Knowledge of symptoms of TB among those who were aware of TB

Symptoms	Respondents	
	No	%
Cough	73	39
Haemoptysis	38	20
Chest pain	9	5
Fever	11	6
Cough & fever	3	2
Fever & chest pain	1	1
Cough & haemoptysis	5	3
Cough, fever, chest pain and haemoptysis	34	18
No idea	15	8
Total with knowledge	189	100
of TB		

Discussion

Health service utilisation has been associated with several socio-demographic factors such as age, gender and socio-economic status. The main factor associated with health service utilisation is that of 'health services need', as measured by individuals' health status⁴. In this study an attempt was made to study the health seeking behaviour, acceptability of provided health facilities and knowledge of tuberculosis among the tribals of West Godavari district in Andhra Pradesh. This study brings out the attitude towards sickness among the tribals, their faiths and beliefs and health seeking behaviour, the available health facilities and their utilisation and their knowledge about tuberculosis.

In this study, 61% of the respondents had superstitious beliefs regarding the causes of sickness. Similarly, in a study conducted in Jabalpur among tribals in Madhya Pradesh, evil spirits were attributed to be the cause of various ailments⁵. The belief that most of the diseases occur due to supernatural powers led to the concept of seeking relief through *zadhu* (magic), keeping the modern medical practitioner as a last resort⁵.

However, it was noted in this study that despite the socio-economic background of the tribals, their attitude towards health and health facilities was in favour of modern medicine. Ninety six percent of the respondents were of the opinion that there was a difference in the present day health seeking behaviour as compared to that of their ancestors. The "quacks" who visit the villages on bicycle and administer tablets and injections are popular among the tribals and have great influence on their health seeking behaviour. This practice is of concern, since inappropriate use of allopathic drugs may ultimately lead to the disastrous development of resistance to drugs. Proper health education is necessary to prevent this. This is highlighted in a study conducted in Zimbabwe⁶, where the author emphasised on continuing health education to facilitate the appropriate use of antimicrobial agents and to discourage those who impede it, keeping in mind the societal beliefs and attitudes.

Most of the respondents felt that their traditional medicines had become ineffective due to

change in food habits. In a study on health seeking behaviour in Zimbabwe, Cavender stressed the broader spectrum of health care which included traditional medicine⁷. The availability of increased health facilities and accessibility to health personnel also contributed to the change in their attitude towards the disease and health seeking behaviour. Population in the selected area was aware of the availability of modern health facilities and was willing to accept the same, even though a good proportion of them still had a superstitious belief regarding the causes of the disease. This is an encouraging sign.

Similar studies undertaken in rural areas have also shown that home remedies, native medicine, self medication, treatment from private doctors and government health facilities are the different options for a person who falls sick in rural areas.

A study reporting on the knowledge of causes of tuberculosis among literate tribal youth in Jawadhu Hills, Tamil Nadu, brought out that 71% of the respondents had not even heard of tuberculosis. The present study brings out that 44% of the tribal respondents had heard of tuberculosis.

This study suggests that the lack of optimal utilisation of health services by tribals may be due to a variety of reasons. Some services are inappropriately used, whereas others, such as preventive health programmes, are under-utilised. Practical difficulties experienced by tribals may be another reason for under-utilisation. In a survey on the health behaviour of the Chinese in Hull, who formed a minority, similar findings were reported¹⁰. One of the main reasons identified was communication difficulty faced by many Chinese due to language problem. What is needed to improve the awareness about basic health needs of tribals is, proper health education, better medical services with a sympathetic and understanding attitude of the doctor and health staff.

Some of the remedial measures suggested by the Regional Medical Research Centre for Tribal Health, Jabalpur⁵ are frequent visits of the PHC staff to infuse confidence among the tribals and to establish services of mobile clin-

ics. Nevertheless, it is important to undertake more behavioral studies before planning health interventions.

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TUBERCULOUS STRICTURE OF THE RECTUM - A CASE REPORTD.K. Pal¹, P.C. Biswas² and S. Das³

(Received on 11.12.95; Accepted on 6.2.96)

Summary: A case of tuberculosis of rectum complicated with intestinal obstruction is presented.

Introduction

Tuberculosis is a world wide problem. The disease may affect any organ of the body. No part of the gastro-intestinal system is immune to this disease.

Case Report

A 45 years old Hindu male attended the N.B. Medical College with complaints of mucoid to purulent discharge with stools, incomplete sense of evacuation and gradually increasing constipation for the past 2 months. On examination, the patient was normotensive and otherwise normal P/R examination revealed tenderness in the rectum and induration on palpation. Proctoscopy showed a large ulcer encircling the lumen of the rectum. A provisional diagnosis of carcinoma of rectum was made.

His haemogram was; Hb-9.6 g%, TLC-9400/cumm, N-60%, L-34% M-2%, E-4%, B-0%, ESR-64 mm/hr. Biochemical parameters like blood sugar, serum urea and creatinine were within normal limits. Ultrasonography of abdomen and X-ray chest were also normal. Mantoux test was

5mm induration. Biopsy taken from the edge of the ulcer was reported as "epithelioid cell granuloma with caseation and Langhans giant cells". Examination of stool for AFB for 6 consecutive days was negative but a section taken from the granuloma showed AFB on Ziehl-Neelsen staining.

Anti-tuberculosis chemotherapy was started with Rifampicin (450 mg), INH (300 mg) and Ethambutol (SOOmg) daily. After 2 months, Ethambutol was withdrawn and the other 2 drugs were continued. After 4 months of therapy, the patient was again admitted to hospital with acute intestinal obstruction. P/R examination revealed a tight stricture in the rectum 5 cm. above the anal verge. An emergency loop transverse colostomy was carried out to relieve the obstruction.

A barium enema and a barium cologram suggested a stricture in the rectum. Repeat biopsy was taken from the stricture under general anesthesia which again showed the picture of tuberculosis but with increased collagen bundles indicating (tuberculosis healing). After 3 months, a definitive surgery was planned. The stricture portion was excised by the abdomino-perineal approach and end-to-end anastomosis was performed preserving the anal sphincter. But unfortunately, the patient died in the post-operative period due to severe myocardial infarction.

1. R.M.O. cum Clinical Tutor 2. Assistant Professor 3. Professor and Head
Departments of Surgery & Pathology, North Bengal Medical College & Hospital, Sushrutnagar, Darjeeling, West Bengal.

Correspondence: Dr. Dilip Kumar Pal, Deptt. of Surgery, North Bengal Medical College, P.O. Sushrutnagar, Dist. Darjeeling-734432

Discussion

Tuberculosis is still an alarming disease inspite of effective modern chemotherapy. The prevalence of abdominal tuberculosis varies from 0.02% to 5%'. It may affect any part of G.L tract, from oropharynx to anus. Though tuberculous enteritis is commonest in the ileocaecal region, it may affect any part of the gut².

The source of infection is usually from swallowed infected sputum, infected milk or from tuberculosis from female genital organs³. Though the most common site is terminal ileum, rectum may be involved by prolonged close contact between infected gut contents and the rectal mucosa. Infection of the Payer's patches, mucosal swelling and sloughing leads to tuberculous ulcer formation. Subsequent healing of the ulcer with fibrosis leads to stricture formation.

Diagnosis causes a dilemma because of non-specific mode of presentation and similarity with other diseases. In ulcerative stage, similar feature may be presented by solitary rectal ulcer of idiopathic origin. In the stenotic stage, carcinoma of the rectum or Crohn's disease give a sim-

ilar picture and without histological proof it is not possible to rule out the other conditions. On microscopy examination of the specimen, the classical tuberculous lesion with caseation necrosis, epithelioid cells and fibrosis may not always appear and caseation may not be seen in patients with gastro-intestinal tuberculosis⁴. The only absolute diagnostic criterion is the actual demonstration of bacilli in a tissue section⁴.

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TUBERCULOSIS OF PENIS : REPORT OF TWO CASES

Dilip Kumar Pal¹, Anup Kumar Kundu², Subrata Chakraborty² and Shikha Das³

(Original received on 8.5.95; Revised version received on 18.4.96; Accepted on 30.4.96)

Summary: Two cases of the very rare tuberculosis of penis are present

Introduction

Tuberculosis of penis is a very rare clinical entity¹⁻⁴. We present 2 cases of primary tuberculosis of penis along with review of literature.

Case Reports

Case No. 1: A 24 year old unmarried man was admitted with history of a slow growing ulcer with swelling of the glans penis for the preceding 6 months. Initially, there was a small ulcer on the dorsal aspect of glans penis which gradually enlarged and then multiple nodules of varying size appeared on the ulcerated glans penis. He did not have any problem with micturition.

On examination, there was a cauliflower like growth with nodular surface occupying the whole of the glans (Fig.1). It was tender and firm in consistency. The external urethral meatus was hidden under the growth. Inguinal lymph nodes were nonpalpable. Clinically, it looked like carcinoma penis.

On investigation, haematological examination showed HB-10.9 g%, TLC-13000/cumm. N-65, L-31, M-06, B-00 and ESR 46 mm/hr; renal biochemical parameters were normal. X-ray chest was noncontributory. Biopsy was taken from the growth under local anesthesia. Histological report was "tuberculous balanitis". Urine examined for AFB on 3 consecutive days was negative. IVU was normal.

Case No.2: A 30 year old married patient, presented with an ulcer on the dorsal surface of glans penis for the preceding 3 months (Fig.2). Examination revealed an ulcerated, foul smelling necrotic area on the dorsal aspect of the glans penis. Its edge was irregular and indurated; the base was granular arid there was serosanguinous discharge. Inguinal lymph nodes were palpable on both sides. No urinary symptoms were present. He gave a history of extramarital exposure 12 years back. The prostate, seminal vesicles, epididymis & testis were clinically normal. A provisional diagnosis of gummatous syphilitic ulcer of penis was made.

On investigation, haematological examination showed Hb -11.2 g%. TLC - 13800/cumm., N-68%, L-36% E-4%, M-2%, B-0% and ESR 36 mm/hr. Blood sugar and urea were normal. Repeated VDRL tests were negative. Urine for



Fig.1 Showing tuberculosis of the glans penis

1. R.M.O. cum Clinical Tutor, 2. Reader, 3. Professor & Head, Pathology, Departments of Urology, Pathology and Surgery, North Bengal Medical College, Darjeeling-734432.

Correspondence: Dr. Dilip Kumar Pal, Dspt. of Surgery, North Bengal Medical College, P.O.I Sushrutnagar, Dist. Darjeeling-734432

microscopic examination did not show any abnormality. X-ray chest was normal. Biopsy taken under local anesthesia showed 'Tuberculous granuloma with intense Obrosis and endarteritis'. Urine examined for acid fast bacilli three consecutive days was negative. The IVU was noncontributory. Mantoux test read after 72 hours did not show any induration.



Fig.2: Showing tuberculous ulcer of the glans penis.

Case Management

Treatment was started with Rifampicin, Pyrazinamide, Ethambutol and INH in both the patients. After two months, Pyrazinamide and Ethambutol were discontinued and the other two drugs were continued for 7 months. After 9 months of chemotherapy, circumcision was done on the first patient. Histological examination of the excised prepuce skin did not reveal any evidence of residual disease. In the second patient, the penile ulcer healed after 3 months of anti-tuberculosis chemotherapy. He was lost after 7 months' follow up.

Discussion

Tuberculosis can affect all the organs of the body but penile tuberculosis is very rare. Till 1971, only 171 cases have been reported in the literature¹. Penile tuberculosis occurs in adults and may be primary or secondary to pulmonary tuberculosis². The primary cases occur as a complication of ritual circumcision during which the operator sucks the circumcised penis. Some of

these have open pulmonary tuberculosis²⁴. Sucking was done as a haemostatic and styptic measure but after the turn of the century this act was practically eliminated from the ritual, with the result that tuberculosis of the penis is rarely seen now. Primary tuberculosis can also occur during coital contact with the disease already present in the female genital tract or even from infected clothings^{5,7}. The bacilli are inoculated into abrasions caused by vigorous sexual act since the normal mucosa is highly resistant to tuberculosis¹. Sometimes, a penile lesion may be caused by reinoculation of the male partner through his own infected ejaculate as vagina is particularly resistant to tuberculosis². Secondary penile tuberculosis can occur along with evidence of active pulmonary tuberculosis elsewhere. Sometimes concomitant diabetes leads to such an atypical manifestation of tuberculosis³.

Tuberculosis of penis may affect the skin, glans or cavernous bodies. In most cases, the lesion appears as a superficial ulcer on the glans or around the corona as it is the most common part rubbed during sexual contact or with infected clothings⁴. Rarely the lesion may be present as a solid nodule⁹. Destruction of the glans may be caused by the disease process and advanced cases may present with erectile failure due to tuberculous cavernositis. The female partner should always be evaluated for genital tuberculosis. For differentiation from carcinoma penis, histopathological examination is essential. IVU should be done to exclude the upper renal tract tuberculosis.

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HYDROPNEUMOTHORAX IN TROPICAL PULMONARY EOSINOPHILIA

R. Prasad¹, S. Tandon², S. Kant³ and P.K. Mukerji⁴

(Original received on 7.9.95; Revised version received on 19.6.96; Accepted on 9.7.96)

Summary: A case of tropical pulmonary eosinophilia presenting as hydropneumothorax is presented. The patient responded to diethyl-carbamazine therapy.

gion and hyper-resonance above it. Shifting dullness and succussion splash were also present. Breath sounds and vocal resonance were diminished on the same side.

Introduction

Tropical pulmonary eosinophilia usually presents as bouts of cough, wheezing and dyspnoea, mostly nocturnal with fever and other constitutional symptoms. The peripheral blood shows an absolute eosinophil count above 3000/Cu mm and raised IgE levels. Chest X-ray shows increased bronchovascular markings with mottling involving the middle and lower zones and prominent hila. Unusual radiological presentations such as cavitation^{1,4}, pleural effusion^{1,4}, and pneumonia^{4,8} have been reported.

The present case presenting as hydropneumothorax is rare in tropical pulmonary eosinophilia.

Clinical Record

A 32 year old male presented with history of cough and sudden onset of chest pain with breathlessness for five days. There was no history of weight loss, trauma or passing worms in stools. He was a non-smoker and non-alcoholic.

On examination of the chest, movement was diminished on the left side. On percussion, stony dullness was found in the left intrascapular re-

Chest X-ray PA view dated 26.9.1994 showed evidence of hydropneumothorax on the left side (Figure 1). Lateral chest X-Ray was not done. Total blood leukocyte count was 10,000/Cu mm

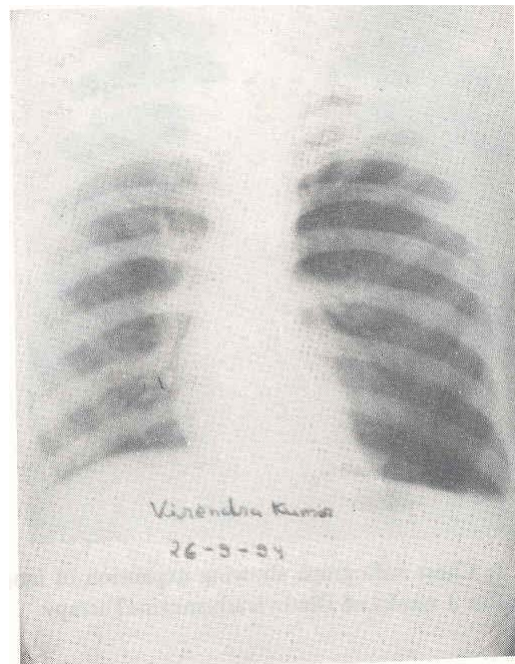


Fig. 1: Chest radiograph showing hydropneumothorax on left side

1 Assistant Professor 2 Junior Resident 3 Senior Resident 4. Professor and Head of Department.

Department of Tuberculosis & Chest Diseases., King George's Medical College, Lucknow-226003

Correspondence- Dr Rajendra Prasad, Assistant Professor, Department of Tuberculosis & Chest Diseases, K.G.'s Medical College, Lucknow-226003.

and absolute eosinophil count was 3200/Cu mm. Sputum was persistently negative for acid fast bacilli by smear examination. Stool examination did not show any ova or cyst. Urine examination was normal. Mantoux test using 5 units of PPD RT 23 showed 6 mm induration.

The patient was advised bed rest and prescribed di-ethyl carbamazine 100 mg thrice daily for three weeks. His symptoms improved. A repeat chest X-ray PA view 3 weeks later, on 25.10.1994, revealed complete expansion of the left lung (Figure 2). Peripheral blood absolute eosinophil count decreased to 500/Cumm. Subsequent follow up for one year revealed no problem.

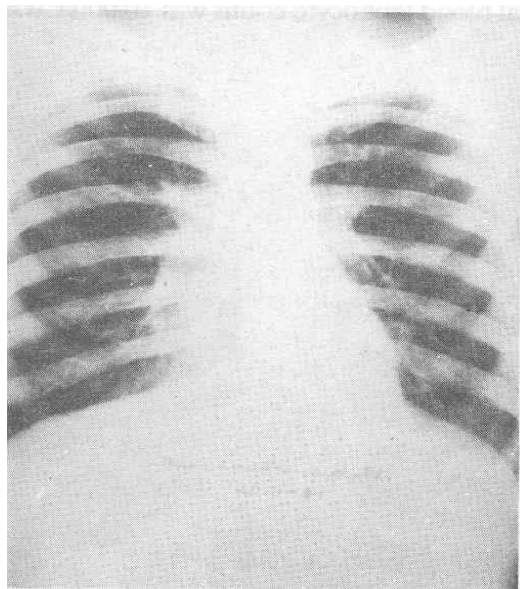


Fig. 2: Chest radiograph showing expansion of lung after 3 weeks of Diethylcarbamazine Therapy

Discussion

Hydropneumothorax in tropical pulmonary eosinophilia is rare¹. Only 2 cases of pneumothorax

have been reported, one by Menon² and another by Jain et al⁹.

How pneumothorax can develop in tropical pulmonary eosinophilia is not clear. It is possible that in the acute stage, when the bronchioles are filled with blood stained mucopurulent secretions, airway obstruction occurs leading to the formation of air cysts. These air cysts may rupture and give rise to pneumothorax. The present cases of hydropneumothorax was thought to be due to tropical pulmonary eosinophilia because of the raised peripheral blood absolute eosinophil count and response to di-ethyl carbamazine.

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RECORDING AND REPORTING IN DISTRICT TUBERCULOSIS PROGRAMME : A SUGGESTION*

V. Sivaraman

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Introduction

The tuberculosis programme management at district level entails maintenance of cards, registers and preparation of reports for submission to the National Tuberculosis Institute, Bangalore. It might be useful to evolve a computer software which will enable data input and analysis systematically.

The aim of this communication is to present the features of such a package for the computerisation of recording and reporting at the district level.

Material and Methods

Computer hardware and software

An IBM compatible personal desk top computer with a 80386/33MRZ microprocessor and monochrome monitor are sufficient for the suggested software.

IBM compatible software or the operating instructions for the computer loaded onto the hard disk include the operating system (MS DOS Version 6.2 and Epi Info Ver. 6.03) (Dean, AG. et al 1994, *Centres for Disease Control*).

The software being presented is code named TBPROG and the opening menu offers the following options: (1) File (2) Edit (3) Data entry (4) Reports (5) Utilities (6) Epi Info/Epi Map and (7) Prog Info.

A. Inputs: The inputs include particulars from Treatment Cards, Monthly Reports received

from Peripheral Health Institutions and drug inventory.

B. Reports: Various reports that can be generated include PHI-wise particulars on case-finding, treatment with SCC and standard regimens. Besides, a module for cohort analysis is provided. Planning supervision visits to different PHIs can be made systematic by generating lists of PHIs sorted out according to date of last supervision.

C. Utilities: Access to EPI INFO and backing up data to diskettes. Calculator and a calendar have been copied from the demo programmes supplied along with EPI INFO.

Programme information: This module provides a convenient way to store and retrieve relevant programme information, eg. number of PHIs available, those implemented, etc.

Besides, "help" is made available on the different modules.

Output: The software is designed to generate some reports that have to be prepared, as per the programme manuals.

An analysis of the treatment cards prepared at the DTC to show age, sex, sputum confirmation and type of disease (pulmonary, extra pulmonary, etc.) can be done at user defined intervals.

*Readers interested in obtaining details may get in touch with the author.

Correspondence: Dr. V. Sivaraman, TB Control Officer (Rtd.), 48-A Vth Cross Street, Tagore Nagar, Pondicherry 605008.

The report on DTC cases is similar to the one prescribed under revised strategy, stressing categorisation of cases. The health institutions performing below expectation in sputum examination and case detection can be listed.

The software has been tested with the actual programme data of Pondicherry and found satisfactory.

A time has come for tuberculosis workers in India to get acquainted with this concept. Other areas of operation in DTC can be computerised. It is hoped that the present paper will stimulate discussion on this topic and is a modest attempt.

The advantages of the system presented are:

1. It can be operated on cheaper models of personal computers.
2. No sophisticated commercial software is necessary (except MS DOS). The other software needed is EPI INFO which is designed

for distribution by copying from person to person.

3. The statistical clerks involved in data entry and computer operation can be involved in the work. If they are not familiar with computers, a minimal training of 20-30 hrs will be enough, as user friendly features are incorporated and on-line help is available. Knowledge of advanced computer programming is not needed.

It is believed that the process will enhance the ability of districtcentres to provide timely information to state and central authorities besides reviewing their own performance.

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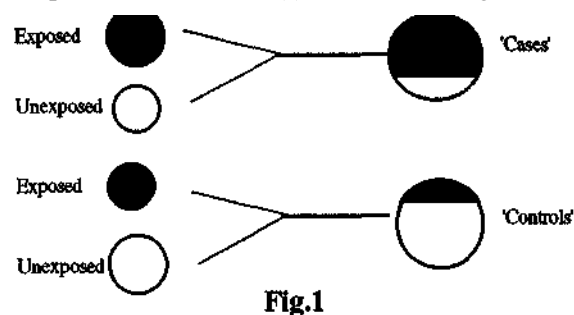
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CASE-CONTROL STUDIES

Nishi¹, and J.K. Aggarwal²

A question commonly asked in an epidemiological investigation into the aetiology of a disease is whether some manifestation of ill-health is associated with certain personal characteristics or habits or with a particular aspect of the environment in which a person has lived or with experiences he has undergone. For example, is the risk of death from lung cancer related to the extent of cigarette smoking? Is the risk of incurring a certain illness greater for individuals who were treated with a particular drug during a previous illness? Sometimes, questions like these can be answered by controlled experimentation in which the presumptive personal factor can be administered or withheld at the investigator's discretion. More often, however, the experimental approach is out of question. The investigator must then be satisfied with observing whether there is an association between the presumed factor and the disease? These questions, then, will usually be studied by surveys rather than experiments. There are two main designs for aetiological surveys: *Case Control* study and *Cohort* study.

Case-control study is a non-experimental one in which subjects are enrolled contingent to the presence (*Cases*) or absence (*Control*) of the defined outcome. Then, cases and controls are compared with regard to prior exposure to the suspected causal factor(s) as shown in Fig.1



The central problem in a case-control study is the method by which the controls are chosen. Usual sources for selection of control subjects are (a) hospitalised patients and (b) the community. For these two sources, there are some advantages besides limitations. The advantages for the selection of hospital controls are that they are (a) easily accessible, (b) usually willing to co-operate and (c) tend to have socio-economic features similar to the cases in all respects except the medical condition under study, and its associated aetiological factors. And, the limitations for selecting hospital controls are that (a) the prevalence of exposure may not be indicative of non-disease status and (b) the illness of cases and controls may have etiological similarities.

It is desirable to select the control subjects from the same area i.e. community source. The advantage for selecting community controls is that the prevalence of exposure is likely to be indicative of non-disease persons. However, selecting community controls is (a) expensive and time consuming, (b) tends to have a low level of co-operation and (c) certain groups (examples: siblings, neighbours) may be so similar to the cases that the potential associations are obscured

There are some other approaches to the selection of controls from the general population, namely:

1. A complex sample survey: A random sample drawn from census tracts with weightage proportional to the size of the population.
2. A sample of neighbour cases.
3. A random sample of names from existing rosters, for example, health care financing

administration register, town books, voters list, etc.

4. Random digits telephone dialing - a random sample drawn from residential telephone numbers. Table 1 compares the various methods according to the criteria considered crucial.

Table 1 : *Comparison of various methods for selecting controls from general population*

<i>Criterion</i>	<i>Best method</i>	<i>Worst method</i>
Representativeness	Complex Survey	Neighbours
Cost	Existing rosters	Complex survey
Speed	Existing rosters	Complex survey
Staff Safety	Random telephone dialing	Complex survey

It is necessary to observe that control groups selected by either of these methods are unlikely to share the same aetiological factors experience. Further, the frequencies with which the various factors are found will usually vary with age and sex of cases and controls.

The typical sources for the identification of cases are hospitals, disease registers, vital records bureaus, outpatients clinics, diagnostic laboratories and insurance claims etc. Cases should be chosen in such a way that they share the same characteristics such as social and environmental conditions or ethnic features. Comparison between cases and controls must, therefore, take account of any differences there may be in age and sex distribution of the two groups. Such adjustments are commonly avoided by arranging that each case is paired with a control individual who is deliberately chosen to be of the same age and shares any other demographic features which may be thought to be relevant.

Illustrations

In a case-control or retrospective inquiry, the starting point is the affected person. For example, in a person having active pulmonary tuberculosis, uncovering of features in his history which may have led to that condition say, cigarette smoking, occupational hazard, overcrowding, malnutrition, etc. may be relevant. Does one or more of these features appear more frequently in the histories of the affected persons than in the unaffected normal population? This indeed is the classical method of epidemiology which seeks to show that of the persons infected, say, with any type of fever, most had consumed a particular type of water while of those who were not affected, relatively few had done so.

Illustration 1

A retrospective study to investigate the role of smoking in the aetiology of pulmonary tuberculosis was carried out. A consecutive group of patients who reported to New Delhi Tuberculosis Centre for diagnosis were questioned regarding smoking history. Each person was interviewed on the basis of a pre-designed questionnaire. The only difference between the cases and controls was in their reported smoking habit. The aim of the study was to assess whether symptomatic patients with history of smoking were more likely to be tuberculous than those without such a history. A total of 4,683 persons (2,410 cases and 2,273 controls) were selected and interviewed (Table 2).

Table 2: *Distribution of cases and controls according to sex*

<i>Sex</i>	<i>Cases</i>	<i>Controls</i>
Male	1279 (53.1%)	932 (41.1%)
Female	1131 (46.9%)	1341 (58.9%)
Total	2410(100.0%)	2273(100.0%)

All the selected subjects were examined and their smoking histories were recorded. Table 3 shows the sex distribution of cases and controls according to the factor of smoking. From 2273 healthy controls, 599 were exposed to ‘risk factor’ smoking while of the total 2410 cases, 1005 were so ex-posed. The difference in the proportion of non-smokers in males and females is statistically significant (Table 3). As smokers and exsmokers among females were only 9.5% in the control group, only males are considered for further analysis. Since the age distribution of smokers and non-smokers was not similar, due allowance was made for this during analysis, (details omitted in this paper).

Table 3: *Distribution of cases and controls according to sex and smoking habit*

Risk FactorSex (Smoking)		Cases		Controls	
Exposed	Male	910	(90.5%)	520	(86.8%)
	Female	95	(9.5%)	79	(13.2%)
Total		1005	(100.0%)	599	(100.0%)
			41.7%		26.4%
Unexposed	Male	369	(26.3%)	412	(24.6%)
	Female	1036	(73.7%)	1262	(75.4%)
Total		1405	(100.0%)	1674	(100.0%)
			58.3%		73.6%
Total		2410		2273	
			100.0%		100.0%

Assuming the hypothesis that there is no relationship between smoking and diagnosis of tuberculosis among symptomatic patients and for

testing the hypothesis, χ^2 test was applied. It was observed that smoking was highly and significantly associated with diagnosis of tuberculosis ($\chi^2 = 55.63$ for 1 d.f., $p < 0.001$).

The case control approach is commonly used to assess the risk of developing disease from environmental exposure. The parameter of interest is the estimation of the relative risk of developing a disease in the presence of a characteristic, as compared to the absence of the same characteristic. One can see that the relative risk is the proportion of diseased persons among the exposed as compared that with among those non-exposed to a certain factor(s). In this situation the ratio is 1.95. This suggests that the probability of being diagnosed tuberculosis is about two times more among smokers than in non-smokers.

For this 95% confidence interval for relative risk $RR^{1\sqrt{1.96/\alpha}}$ is (1.63, 2.32).

Frequently, the estimate of relative risk is made from each of a number Of sub-sets of data and there is some interest in comparison and combination of these different estimates. There may, for example, be several studies of the same aetiological problems done at different times or in one study data may have been subdivided into one or more categories, such as age-groups, which may affect the relative proportion in rows or columns while applying the χ^2 - test. A rather simple method of combination is due to Mantel and Haenszel.

Table 3 (a): *Age distribution of cases and controls among males according to smoking habit*

Age	18-30 yrs.		31-40 yrs.		41-50 yrs.		51-60 yrs.		60 & more		Total	
	Cases	Controls	Cases	Controls	Cases	Controls	Cases	Controls	Cases	Controls	Cases	Controls
Risk Factor (Smoking)												
Exposed	422	292	241	109	148	76	78	34	21	9	910	520
	% 46.4	56.2	26.5	20.9	16.3	14.7	8.6	6.5	2.2	1.7	100.0	100.0
Unexposed	303	349	37	34	18	19	8	8	3	2	369	412
	% 82.1	84.7	10.0	8.3	4.9	4.6	2.2	1.9	0.8	0.5	100.0	100.0

Thus, for the study, distribution of cases and control subjects was used Table 3 (a) to assess the association between smoking and tuberculosis in different ages; Mantel-Haenszel test was applied and χ^2 was found to be 9.59, which is significant ($p < 0.05$). Further, the relative risks for each age group were calculated as 1.66, 2.03, 2.06, 2.29 and 1.56 for 18-30 years, 31-40 years, 41-50 years, 51-60 years, and more than 60 years, respectively. It was observed that as the age increased the probability of being diagnosed tuberculosis among smokers also increased.

Illustration 2 : Consider another example of a case-control study² of an acute condition with uncertain aetiology, carried out by Gene Mcgrady et al during 1985, to investigate association with transfusion of packed red blood cells. Of 187 new-borns admitted to a 33-bed, level III, neonatal intensive care unit between January, 1985 and June, 1985, 33 developed necrotizing enterocolitis during their hospital stay. Twenty of the 33 newborns (61%) had onset of symptoms between April to June, suggesting clustering during this period. A case-control study, with matching on birth weight class, and approximate duration of stay failed to reveal any association of the syndrome with type or time of feeding, perinatal hypoxic events as determined by APGAR scores or specific microbial organisms. By contrast, the transfusion of packed red cells was highly and significantly associated with the syndrome (odds ratio = 15.1 and 95% confidence interval 2.59-95.1). In addition, therapy with caffeine, theophylline and furosemide was moderately associated with the syndrome, although not so significantly. During this period, the incidence of necrotizing enterocolitis by birth weight was 30.6% in infants less than 1500 gm., 10.8% in infants 1500-2500 g. and 11.9% in infants 2500 g or more. These findings confirmed the importance of low birth weight as a risk factor for the development of the syndrome.

Multiple Control Groups

In some case-control studies, the exposure histories of cases are compared separately, against separate control groups. The purpose of making

multiple case-control comparisons on the exposure factor of interest is to provide an internal assessment of the reproducibility and, hence, generalisability of the relationship under study. A case-control study involving the use of two control groups is given below.

Illustration 3

A case control study was carried out in 1982-83 by Robert, S et al³ to investigate the possible influence of behavioural factors on the risk of urinary tract infection. Study participants were college women attending a student health service. Cases were 43 women with culture confirmed urinary tract infection. There were two control groups : 149 women with upper respiratory tract infection and 227 women visiting the gynecology clinic. Using each set of controls, the study confirmed that sexual intercourse was the risk factor. And, there was a dose-response effect with increasing level of coital frequency. The study also found that the use of diaphragm was significantly associated with UTI (Odds ratio 3.0, 2.3), an association which remained significant even after allowing for possible confounding by coital frequency.

Thus, case-control studies can be used for the advantages such as (a) efficient sampling of diseased persons, (b) inexpensive and (c) rapid conclusions. Further, it has some disadvantages namely, (a) indirect estimate of risk ratio, (b) inefficient for rare exposure and (c) occasional bias.

With these advantages and disadvantages, in certain circumstances, one might choose to make a pilot case-control inquiry before embarking upon a more arduous cohort investigation.

References

1. An association between smoking and tuberculosis (1989): Data from New Delhi Tuberculosis Centre, (Personal Communication).
2. Gene A. McGrady et al (1985) : An outbreak of necrotizing enterocolitis, association with transfusion of packed red blood cells, American Journal Of Epidemiology, Vol. 126, p-1165-72.
3. Robert, S. et al (1987): Risk factors for urinary tract infection, American Journal Of Epidemiology, Vol. 126, No. 4, p-685-694.

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AIDS AND CANCER - A Ray of Hope	PREDICTING AIDS
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A homosexual in Australia, a regular blood donor, was found to be HIV positive. Seven recipients of his infected blood were traced out and they too were found to be similarly infected. However, neither the donor nor the recipient had developed active AIDS disease, and have been in apparent good health over the last 14 to 15 years. The mystery about why none of them have developed active AIDS when the observed maximum period of freedom from the disease has been 8-10 years after infection, has recently been solved with the chance discovery that that particular virus has a defect in its genetic script which slows down its replication to a considerable extent. This virus retains its ability to infect the T cells. But its ability to reproduce and invade other cells is so compromised that even the most efficient detection systems can barely detect its presence. Some of the infected persons were found to have only one or two infected cells per 100,000 T cells compared with the usual AIDS load of thousands of virus particles in the same number of T cells. It is being considered that this flawed virus may prove useful in developing a vaccine against AIDS. At least, this genetic defect could be exploited to develop drugs which could block the particular NEF gene involved.

In Southampton University, medical researchers have also developed a gene-based vaccine against multiple myeloma. Using genes to activate body immune system cells to attack and destroy cancer cells approximates to simulation of the natural immune response to other microorganisms through which the immune system responds to them by developing antibodies.

Techniques that enable the measurement of "virions" load in the plasma of people infected with HIV have now provided a possible means of predicting the development of frank AIDS, after a given number of years, and eventual death of those who are afflicted. John Mellors et al have recently reported in Science their findings with the viral load test which quantifies HIV genetic material circulating in plasma and its relationship with the development of frank disease, over time. The data indicate that it is possible to predict AIDS, as far as 10 years into the future, similar to the "staging" done for tumours, which helps to devise the best course of therapy for those individuals who have cancer.

About the same time, Berger et al have reported in Science the discovery of a protein, "Fusin", which appears to be necessary for HIV to gain entry into the human immune system cells. Receptor CD 4 cells and Fusin appear to be playing a regulatory role over the entry of HIV into the system and their interplay may be holding the key to the riddle why some persons escape infection after exposure, and some of the HIV infected people remain healthy beyond 10 years after turning seropositive. Fusin may be the co-factor regulating the circulating virions in the blood and causing delay in the appearance of AIDS.

Exposed to infection with HIV, some individuals may not become HIV seropositive due to failure of HTV seropositiyes do not always develop frank AIDS, and die, because of virus failure to replicate quickly and sufficiently in the body.



FORUM

Sir,

I am working in Hong Kong and am responsible for the control of tuberculosis in the territory. I would be most grateful if I can share our experience in TB control with other parts of the world.

In view of the recent statement by WHO on BCG vaccination (Reference : WHO Wkly. Epidem. Rec.; 1995, 70 (32), 229-36), we are going to review our BCG vaccination programme in Hong Kong. At present, we are giving BCG vaccination to two major groups:

- (a) Newborn babies: over 99% are covered by direct BCG vaccination;
- (b) Primary school children (aged 6 to 10) : they are given BCG vaccination again if tuberculin test is negative.

A Table and a graph showing the rate of TB in Hong Kong are given below.

I would be most grateful if you could kindly let us know the information of your country concerning:

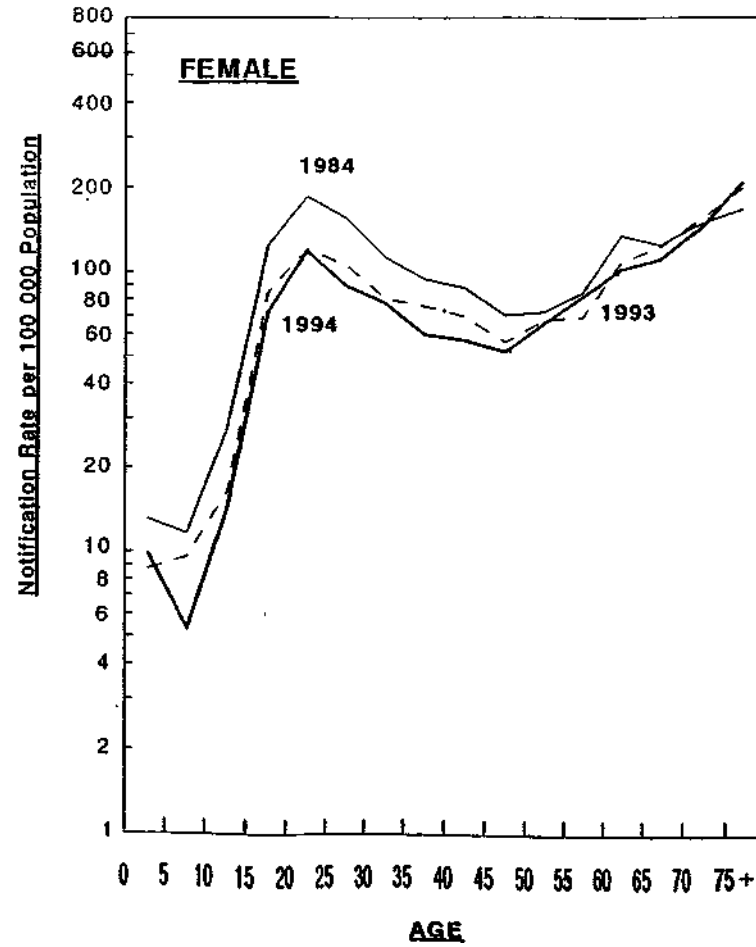
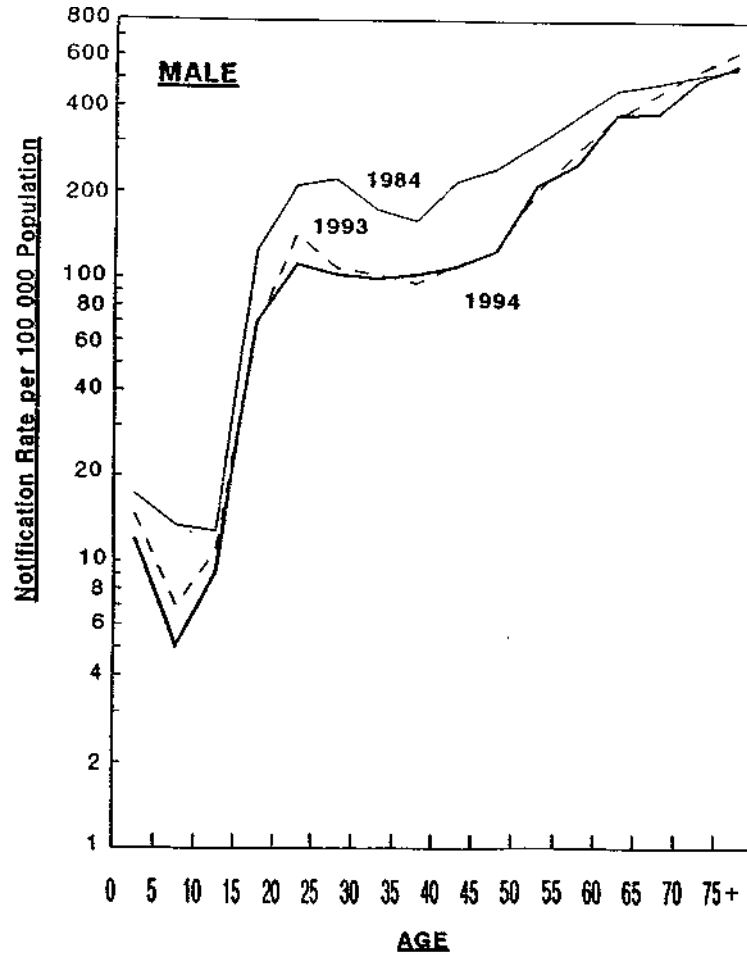
- (a) the BCG vaccination protocol, and since when this policy has been practised;
- (b) the incidence rate of TB in relation to age groups (both Table and Graph, if possible).

Dr. CM. Tarn
Hong Kong Government,
Dept of Health
Hong Kong.

Tuberculosis Notifications (All Forms) & Rate by Age and Sex, 1994

Age group	Tuberculosis notifications (all forms)			Tuberculosis notification rate (per 100,000 population)		
	M	F	T	M	F	T
Under 1	7	3	10			
1	7	4	11			
2	3	2	5	11.9	8.4	10.2
3	4	4	8			
4	2	2	4			
5 - 9	10	8	18	5.0	4.4	4.7
10 - 14	20	25	45	9.1	12.3	10.6
15 - 19	147	128	275	70.0	66.1	68.1
20 - 24	263	271	534	112.9	111.7	112.3
25 - 29	279	239	518	103.6	82.8	92.8
30 - 34	331	239	570	100.4	71.6	85.9
35 - 39	330	165	495	103.7	54.8	79.9
40-44	288	122	410	110.7	52.2	83.0
45 - 49	249	78	327	126.1	47.4	90.4
50 - 54	290	63	353	216.7	60.2	148.1
55 - 59	361	88	449	257.5	75.3	174.6
60 - 64	496	111	607	383.9	95.4	247.3
65 - 69	404	110	514	385.1	104.2	244.2
70 - 74	360	112	472	505.6	135.6	306.9
75 - 79	246	106	352			
80 - 84	147	71	218	570.3	199.5	342.7
85 & over	50	70	120			
Unknown	3	1	4			
Total	4297	2022	6319	139.2	68.0	104.2

TB Notification Rate by Age & Sex 1984,1993 & 1994



NEWS & NOTES

47th TB SEAL CAMPAIGN - 1996

At solemn function on 2nd October, 1996. His Excellency, the President of India, Dr. Shanker Dayal Sharma inaugurated the 47th TB Seal Campaign of the tuberculosis Association of India at Rashtrapati Bhavan. The Secretary (Health), Ministry of Health & Family Welfare, Government of India, Shri P.P. Chauhan, presented the new TB Seals (on Birds) to the respected Rashtrapatiiji.

The Director General of Health Services Dr. Narendra Bihari (Chairman of the TB Association of India) presented the special TB Seal Souvenir to His Excellency the President of India. Extending felicitations to the Association, the President hoped that there would be a great support from the public to the Tuberculosis Campaign. The function was covered on Television, Radio and in the Press.

Among other dignitaries who attended the function were Mrs. Shanta Dave, Lt. Genl. Raghunath Rai, AVSM, PHC, Director-General,

AFMS, Dr. Bhai Mohan Singh, Dr. R.P. Bhagi, Dr. R.C. Jain, Shri M.P. Gupta and Secretary-General Tuberculosis Association of India, Shri Ashok Sachdeva.

The Special Souvenir brought out on the occasion has been well received and appreciated.

Enhancement of Annual Subscription

In view of the substantial increase in the cost of production of the Indian Journal of Tuberculosis, the Finance & Executive Committees of the Tuberculosis Association of India have decided to enhance the annual subscription of the Indian Journal of Tuberculosis from Rs.200/- to Rs.250/- from the January 1997 issue. All subscribers are requested to kindly remit their annual subscription for the Journal for the year 1997 by December 1996 together with the Form which appears in the current issue. The overseas subscription rates remain unchanged.

OBITUARY

Shri N.K. Gupta, Administrative Officer, 1940-1996

With great sorrow, we have to record the sad and untimely demise of Shri N.K. Gupta, Administrative Officer, New Delhi Tuberculosis Centre on 19 August 1996 during a pilgrimage to the holy Amarnath Shrine.

Born on 2nd October, 1940, Shri Gupta joined the New Delhi TB Centre as an Accountant in 1966 and rose to become the Administrative Officer in 1981.

The New Delhi TB Centre and the Tuberculosis Association of India mourn the loss and convey their heartfelt condolences to the bereaved family.

Tackling TB: The Search for Solutions - Eds Mukund Uplekar and Sheela Rangan; Published 1996; The Foundation for Research in Community Health, 84-A, R.G. Thadani Marg, Bombay 400 018 and 3-4 Trimiti-B, 85 Anand Park, Aundh, Pune 411 007; Pages 168, Price Rs. 75A, in paper back.

Presently, and for several years to come, this book should prove to be invaluable, alike to tuberculosis workers, social scientists, public health administrators, post-graduate medical students as well as researchers in this country. A few overseas workers may also find it quite useful reading.

The book is the outcome of a comprehensive, multi-disciplinary, four year long field study undertaken to understand the varied problems that are associated with the tackling of tuberculosis in our urban and rural areas. Government's National Tuberculosis Programme (NTP) to deal with tuberculosis was started in 1962. The Foundation for Research in Community Health (FRCH) have studied these problems in and around Pune, in Maharashtra State, in their search for finding relevant solutions to them. The FRCH is an NGO which aims to explore socio-economic and cultural factors that affect health of the people and the health care services available to them. The fund for the study was provided to FRCH by the International Development Research Centre, Ottawa, Canada.

The findings of the study do not come as a 'bolt from the blue', nor may these ruffle the surprise hackles of the readers. The rich bibliography of 187 references includes many that have reported same or similar findings earlier. However, the very well written and easy to read as well as grasp narrative of the book provides a quick insight into people's awareness and patients' perceptions about tuberculosis. As well as the perspectives and practices of health care providers, both public as well as private. The appendices provide details of the research methods used, profile of the Study Area, working Tables on each aspect studied, how quality of field sputum microscopy was judged and a Cohort Analysis of treatment of tuberculosis patients. All in all, efforts have painstakingly been made to cater to the varied interests of the groups

involved in the control of tuberculosis and NTP in the country.

Since tuberculosis offers a good model for studying the socio-anthropological-economic factors underlying diseases, liberal use has been made of the tools of sociological research such as focused group discussions, semi and fully structured, and preceded, interview schedule's and questionnaires, in-depth case studies, observer participation, and the like. Thus, the qualitative aspects of the study were allowed to overshadow the quantitative research methodology with the result that each major point made is illustrated and supported by a vivid case-history. This may leave a deeper impression on the reader but may not always hold water when measured quantitatively. It is, therefore, not difficult to find contradictions between one chapter and another. A judicious mix of the two approaches could have been ideal. It is the belief of the reviewer that qualitative studies are most useful to uncover such social factors, perceptions, behaviour which are not obvious and which could then be studied through the "null hypothesis" quantitative model. Thus, the impression negates that stigma' was probably more in the minds of the researchers than that of the people could have been avoided.

The basic structure of NTP was evolved through Operations Research (OR), and made into a sub-health-care system. Attempts made towards its further evolution/modification or suggestions made to that end, may, therefore, be justified mainly by the OR criterion. The authors have utilized the opportunity offered by their findings to make several recommendations which appear quite logical but remain untested. The temptation could have been resisted. However, all those who are interested in the use of OR in Systems Research and Analysis could now make full use of the findings of this study, including authors' recommendations, to put NTP back on the rails in the coming years.

D.R. NAGPAUL

The Asthma Self-Help Book - Author Dr. Paul J. Hannaway, Clinical Professor, Tufts University School of Medicine; Published 1995, Orient Paperbacks, Madarsa Road, Kashmere Gate, Delhi 110 006; Pages 240, Price Rs. 110 in paper-back, quantity discount available.

This extremely handy, fully informative, judiciously illustrated by line diagrams, and really practicable book could not have come at a better time. Asthma is on the rise everywhere, in developed as well as developing countries, adults as well as school-going children, the poor as well as the rich and athletes as well as desk workers, alike. The book, in effect, carries the message to all asthmatics that they could live a near normal life despite their condition, and that they could take up an active and intelligent role in the management of their asthma.

The book has three parts. Part I is devoted to the understanding of asthma, by no means an easy task. In doing so, the historical, anatomico-physiological, clinical, immunological and psychological aspects have been discussed at length, in technical terms, which may not go down too well with the lay patients who may wish to help themselves. However, this difficulty is partly met with in the way how doctors diagnose asthma. The importance of detailed history, the reasons why tests are ordered and the significance of test results in the management of asthma are described. In fact, the patient is already being prepared by the author for the self-management of his condition with the help of a simple instrument - the peak flow meter.

Part II deals with treatment of asthma. The informative, comprehensive material in this part of the book should be found very useful even by general medical practitioners who do not treat asthma cases routinely. The indications, clinical benefits expected, limitations, side-effects and hints on management, in respect of each major drug have been given in an easy to understand manner. Besides, the role and proper management of environmental factors like air pollution, house-dust, cockroaches, mites, molds, etc. have been fully discussed.

Part III appears to have been added to make the book as complete as practicable. It deals with childhood asthma, senior citizens' asthma, asthma during pregnancy and breast-feeding, complications of asthma and asthma during travelling, sexual intercourse, and use of some drugs. The last chapter gives the guidelines for the treatment of asthma in the 1990s, as well as a pollen calendar of India.

All in all, it is a valuable source of all the updated information on the subject written in a simple and lucid style and meant to help and guide. It could be a recommended reading for medical students, general medical practitioners and patients of asthma themselves.

D.R. NAGPAUL

The Indian Journal of Tuberculosis

ABSTRACTS

Vol. 43, No.4

October 1996

Short-course therapy of pulmonary tuberculosis: doctor's compliance

Roth TB & Karner W: *Tubercle and Lung Disease* 1996 77, 93.

A study was conducted to evaluate the accuracy of treatment monitoring of out-patients (with tuberculosis restricted to patients with uncomplicated tuberculosis) when 6 months short-course chemotherapy (SCC) was prescribed. Out of 88 patients with tuberculosis (proven by culture and admitted to hospital during 1986 to 1991, only 43 could be included in the study. The criteria for inclusion were: culture positive pulmonary tuberculosis, receiving treatment with H,R & Z resistant to these drugs and with no major side-effects.

The treatment was prolonged in 13 cases without obvious reason. Four patients did not convert to sputum negative; at discharge negativity was not proved thereafter during 159 week's follow-up. With discharge of patients after 8 weeks, 4 did not visit their practitioner and were assumed to have not completed treatment. Patient compliance was assessed by H-urine strip testing in 3 cases. In 16 cases, X-ray controls were performed and 6 cases were subjected to monthly checks of liver enzymes. Authors were of the opinion that even highly standardized SCC treatment requires certain level of experience and compliance on the part of practitioners and a chest physician should review every case of pulmonary tuberculosis at least twice.

Vijay K. Challu

The zoonotic importance of *Mycobacterium bovis*

Moda G*, Daborn, CJ; *Grange, JM & Cosivi, O. Tubercle and Lung Disease* 1996, 77,103.

The authors have highlighted the threat posed by this zoonotic disease in developing countries. *M.bovis* infection in humans is not only from bovines but also from other livestock, including goat, deer, buffalo, sheep and camel, kept for milk and meat production. Information on the prevalence of human disease due to *M.bovis* in the developing world is limited due to the technical problems in identification of the species. Evidence for human to human transmission is largely anecdotal and limited. Transmission of *M.bovis* from human to human, leading rapidly to disease is now found in pandemic areas of the world with HIV/AIDS. Differences in the clinical presentation of human disease due to *M. bovis* are related to the route of transmission which may be by direct exposure, or indirectly by ingestion of contaminated milk or meat products. The respiratory route of infection, resulting in pulmonary disease, is more frequent in workers exposed to infected animals, fanners, veterinarians, slaughter house-workers and members of rural community that live in close contact with their animals. The authors propose measures like: implementation of reliable and economic system of veterinary surveillance, provision of information to farmers and those involved in slaughtering and in meat trading, segregation and elimination of tuberculous animals and promotion of heat treatment (pasteurization) programmes besides neonatal BOG vaccination to control bovine tuberculosis in the community.

Vijay K. Challu

Assessment of a possible imbalance between tumour necrosis factor (TNF) and soluble TNF receptor forms in tuberculous infection of the central nervous system

Rydberg J, Mømer H, Chandramuki A, Lantz M. *J. Infect, Dis.* 1995, 172 (1) : 301-6

Distributions of tumour necrosis factor (TNF) and its soluble receptor forms, R55-BP and R75-BP, were analyzed in the cerebrospinal fluid of patients with severe acute or chronic central nervous system infections. Tuberculous infections were associated with high ratios of R55-BP and R75-BP to TNF, 27.2 and 28.0, respectively, suggesting a small biologically active fraction of TNF. The opposite was found in subjects with acute bacterial meningitis. They had large fractions of biologically active TNF and, thus, low ratios of R55-BP and R75-BP to TNF, 3.7 and 4.0, respectively. It is hypothesized that chronic infectious diseases, such as tuberculosis maybe associated with inadequate production of TNF and a concomitant relative increase of soluble TNF receptors, which may prolong the disease.

R. Ramachandran

Serial CT scanning in childhood tuberculous meningitis: prognostic features in 198 cases

Schoeman JF, Van ZYL, Le, Laubscher JA, Donald PR. *J. Child Neurol*, 1995, Jul: 10 (4): 320-9.

Serial cranial computed tomographic (CT) scanning and intracranial pressure monitoring were performed on 198 children with stages II and III tuberculous meningitis. The aims of the study were to document the course of tuberculous hydrocephalus during medical and surgical treatment, as well as the prognostic significance of parenchymal changes in the brain as demonstrated by CT. Lumbar cerebrospinal fluid pressure was

monitored continuously for a 1-hour period in all patients on admission and at weekly intervals in patients with communicating hydrocephalus for the first month of treatment. Cranial CT scanning was done on admission and repeated in survivors after 1 month and again after 6 months of antituberculosis therapy. The raised intracranial pressure of 112 children with communicating hydrocephalus, as demonstrated by air-encephalography, was treated medically (with daily acetazolamide and furosemide) for 1 month. Thirty-one children with non-communicating hydrocephalus were referred for immediate ventriculoperitoneal shunting. No significant difference was found in the eventual ventricular size of clinical outcome between the two treatment groups. Lumbar cerebrospinal fluid pressure changes in the children with communicating hydrocephalus closely followed changes in the degree of hydrocephalus during the course of treatment. The main cause of permanent neurologic disability was basal ganglia infarction, which occurred unilaterally in 21% and bilaterally in 10% of patients on admission and developed in 22% of children during treatment. A prominent subarachnoid space, which was seen on the CT scan of 36% of patients after the first month of treatment and which reverted to normal, probably relates to the poor nutritional state of these patients on admission.

R. Ramachandran

MR and CT imaging of central nervous system tuberculosis in the patient with AIDS

Villoria MF, Fortea F, Moreno S, Munoz L, Manero M, Benito C. *Radiol. Clin. North Am.* 1995, 33 (4) : 805

CNS tuberculosis represents a disease that complicates AIDS with an increasing incidence in endemic areas as well as in developed countries in those patients who have some risk factors such as intravenous drug abuse. Although TB infection of the CNS in AIDS patients may

follow a rapidly progressive course, the imaging findings are otherwise similar to those of the non-immunosuppressed population. Meningeal enhancement, hydrocephalus, parenchymal granulomata, and infarcts are seen frequently and are often observed in combination with one another. Nevertheless, the differential diagnosis in AIDS patients must include other opportunistic infections and primary or metastatic lymphoma of the CNS. Spinal TB is usually seen in the form of epidural abscess secondary to tuberculous spondylitis, although it may be seen in isolation of spinal column involvement. The differential diagnosis includes spinal lymphoma or pyogenic abscess formation. Radiculomyelitis or isolated spinal cord tuberculomata are much less frequently observed and can be suspected on imaging only if there is concomitant evidence of the classical findings of intracranial TB.

R. Ramachandran

Value of bronchoalveolar lavage and gastric lavage in the diagnosis of pulmonary tuberculosis in children

Somu, N. et al; Tubercle and Lung Disease, 1995, 76, 295.

Fifty children aged 7 months to 12 years, who had clinical features suggestive of pulmonary tuberculosis and radiographic abnormalities were given therapeutic trial with Erythromycin and Qiloramphenicoi for 3 weeks. They failed to show any improvement, thus ruling out pyogenic infection. These children underwent gastric lavage in the morning and later on the same day, they were bronchoscoped and bronchoalveolar lavage fluid was obtained. Both the aspirates were cultured for *M. tuberculosis*. 16 (32%) of G.L. aspirates yielded positive cultures while only 6 (12%) of BAL specimens were culture positive. All except one of the six BAL positives gave positive G.L. cultures also. Positive smears were obtained from 3 G L samples, of whom two were smear positive from BAL samples.

The authors conclude that G.L. is the preferred method of looking for definitive diagnosis of tuberculosis and bronchoalveolar lavage does not offer any additional diagnostic yield in children.

S.C. Kapoor

Administration of carbocystaine Sobrerol combination for preventing exacerbations in infective chronic bronchitis.

C Grassi et al: *Giornale Italiano Malattie del Torace (Italian Journal of Chest Diseases) 1994, 48, 17.*

A double blind multicentre trial of two different schedules was carried out in 135 patients, mean age 61.8 years 7.5 S.D., range 40-75 years. All the patients had Chronic bronchitis for at least five years and had suffered at least two exacerbations in the previous six months. One group was given 1 dose per day of the drug combination carbocysteine and sobreroj for 10 days, followed by placebo for 10 days, and this alternation was followed for 6 months. Another group was given the combination daily without interruption for a similar period. The benefit (in preventing exacerbations) was similar in both groups.

S.C. Kapoor

Incidence of Pulmonary Tuberculosis among diabetics.

Kirn, J.M. et al; Tuberde and Lung Disease; 1995, 76, 529.

In a planned investigation, based on medical records of persons claiming health insurance benefits and their biannual medical examinations, it was found that 170 out of 8015 diabetics had developed pulmonary tuberculosis in the two years between 1988 and 1990; 4935 new patients of pulmonary tuberculosis were discovered among 806,698 non-diabetics, during the same two years. The annual incidence was 1061 per 100,000 among diabetics as against 306 per 100,000 among non-diabetics.

S.C. Kapoor

***In Vitro* antimycobacterial activity of a new quinolone - Levofloxacin (DR-3355).**

Saito, H. et al: Tubercle and Lung Disease; 1995, 76, .377.

Levofloxacin is a laevorotatory analogue of Ofloxacin. *In vitro* susceptibility tests were performed with various mycobacterium species - by culture on 7H11 Difco agar plates in a 5% CO₂95% humidified air incubator for 7-14 days, depending upon growth characteristics of the species. MIC of the drug was determined by the colony farming units technique. MIC₅₀ and MIC₉₀ were 0.78 mgu/L with Ofloxacin against 0.39 with Levofloxacin in 25 strains tested. In other mycobacteria also, MICs of levofloxacin were half to one fourth of Ofloxacin. (MIC defined as concentration that did not permit more than five colonies to come up or completely inhibit the growth of the mycobacterium).

S.C. Kapoor

Diagnosis of Tuberculous Meningitis : A comparative analysis of 3 Immunoassays, an Immune Complex Assay and the Polymerase Chain Reaction

Moirner, H. et al; Tubercle and Lung Disease; 1995, 76 381.

CSF from 33 patients of TBM was analysed and compared with CSF from 34 patients with infectious and non-infectious diseases of the central nervous system. Antibody immunoassays were all either insensitive or non-specific and hence of no diagnostic value. Mycobacterial IgG immune complex showed strong correlation with TBM, being positive in 64% compared with only 3% of the controls. PCR analyses strongly correlated with TBM, as 54% give positive DNA amplification against only 2 (6%) of the controls, both of whom had a possible otogenous tuberculosis with secondary infection and spread to the meninges. It is concluded that combining PCR with IgG immune complex detection may be a sensitive and specific method of diagnosing TBM.

S.C. Kapoor
