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Editor:
Dr. P.K. Sen

Co-Editors:
Dr. M.D. Deshmukh
Dr. N.X. Bordia

Associate Editors: Dr.
H.B. Dingley Dr. S.P.
Pamra

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News & Notes

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The Indian Journal of Tuberculosis

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NATIONAL CONFERENCE

Madhya Pradesh had the privilege of holding the 33rd National Conference on Tuberculosis & Chest diseases in November 1978 in the beautiful Auditorium of the Gandhi Medical College, Bhopal. Prof. J.L. Bhatia, Adviser in Tuberculosis, Government of Punjab, was President of the Conference. About 300 delegates, including three from Bangladesh and one from Nepal, attended.

Inaugurating the conference before a large and distinguished gathering, Shri C.M. Poonacha, Government of Madhya Pradesh, exhorted the specialists and Tuberculosis Associations to support the National TB Programme and do everything possible for achieving the goal of controlling tuberculosis. Earlier, the State Minister for Health and Family Welfare, Shri Shitala Sahai, welcomed the delegates and gave a brief resume of the development of TB Control Programme in Madhya Pradesh. Dr. B.N.M. Barua, Adviser-in-TB, Government of India, in his review of the working of the TB Control Programme expressed the hope that TB control may again be made a centrally sponsored scheme in the Sixth Five-Year Plan which will ensure extension of the programme to those few districts of the country where it is yet to be implemented. Shri P.N. Raman, Secretary-General of the Central Association, briefly reviewed the activities of the Association during the preceding year.

In his Presidential Address, Prof. J.L. Bhatia dealt with Chemotherapy, involvement of medical practitioners in the TB Control Programme, training in tuberculosis, drug supply, drug resistance, hospitalisation, etc.

The Scientific Sessions spread over four days covered important subjects like National TB Programme, Role of Serology in Differential Diagnosis, Chemotherapy, Tuberculosis in Children, Extra-Pulmonary Tuberculosis, Management of Non-tuberculous Diseases like Asthma, etc.

In the session on National TB Programme, the shortfalls in the expected targets both in respect of implementation of the programme in the entire country as well as caseholding were highlighted. The more important drug regimens suitable for the rural areas were discussed and the role of multi-purpose workers and the newly created cadre of community health workers was emphasised in ensuring regularity of treatment and preventing drug default.

Regarding the role of Serology in differential diagnosis, the consensus was that the serological tests, as at present understood and carried out, do not

exclude completely the false positives and false negatives but the tests were useful in the diagnosis of pulmonary tuberculosis cases where tubercle bacilli could not be demonstrated in the sputum.

Two sessions were devoted to the important subject of Chemotherapy. Short-term chemotherapy of pulmonary tuberculosis seems to have come to stay though the last word is yet to be said about the suitable drug regimens which would be effective and yet within our financial resources and whether the duration would be sufficiently short to enable a large number of persons, who give up treatment prematurely, to successfully complete the treatment and thus cease to be a source of hazard to the community.

A panel of Six TB specialists and pediatricians discussed the problems of tuberculosis in children in great detail and depth. The consensus was that the prevalence of TB infection in children is about 2% in the age group 0-4 years, 8% in 5-9 years and about 10% in the 10-14 years age group. Since bacteriological proof of diagnosis in the case of disease in children is usually not obtainable, great care is essential in differential diagnosis.

The session on the causative factors and management of Asthma emphasised that pollens, fungi, common insects and household dust were the important offending causative agents. The place of the several available drugs in the management of acute and chronic forms of Asthma and their role in prevention of asthmatic attacks was also discussed in detail.

A new feature of this conference was that an afternoon session was arranged for the benefit of the general practitioners. A large number of general practitioners, members of the faculty of the Bhopal Medical College and post-graduate students took part in this session and got their doubts cleared in respect of a number of problems concerning tuberculosis and non-tuberculous chest diseases from a panel of ten specialists.

Another significant contribution of the conference was about the diagnostic value of BCG which procedure was becoming very popular with paediatricians in the country without scientific basis. It was shown during the conference that BCG was in no way superior to the time-honoured tuberculin in the diagnosis of tuberculous infection.

The conference elected Drs. J.L. Bhatia of Amritsar, Bhagat Singh Alag of Jabalpur, P. A. Deshmukh of Jamshedpur and K.V. Krishnaswami of Madras as its representatives on the Central Committee of the Tuberculosis Association of India.

Dr. N.L. Bordia and Dr. D.P. Verma, Honorary Technical Adviser and Honorary Secretary, Madhya Pradesh State TB Association respectively, assisted by an efficient Organising Committee, made excellent arrangements for the conference. An attractive Souvenir was brought out on the occasion. The Governor gave a Reception and the Health Minister a Dinner to the delegates, who were also entertained to cultural shows on two evenings during the conference.

By all standards, the Bhopal Conference was an outstanding success. Arrangements were excellent. Delegates showed keen interest in the deliberations of the conference and all the sessions were well-attended. Hosting a National Conference is not an easy undertaking these days and we record our appreciation of the tireless efforts put in by the members of the Madhya Pradesh State Association for the success of the conference. Our gratitude is due to all of them.

Readers will recall that since 1973 the Association brings out the April issue of the Indian Journal of Tuberculosis as the Special Conference Number. Summaries of papers presented at the Bhopal Conference and full texts of such papers as the Editorial Board considers to be of special interest are given in the following pages.

CONTROLLED STUDY OF THE EFFECT OF SPECIFIC TREATMENT ON BACTERIOLOGICAL STATUS OF 'SUSPECT CASES'

K.S. ANEJA,* G.D. GOHI** and G.E. RUPERT SAMUEL***
(From National Tuberculosis Institute, Bangalore)

Introduction

The WHO Expert Committee on tuberculosis in its eighth report defined a 'Case' of pulmonary tuberculosis from the epidemiological point of view as a person suffering from bacteriologically confirmed disease. All other possible sufferers from tuberculosis were classified as 'suspect cases'. These 'suspect cases' are recommended to be investigated and followed up without specific anti-tuberculous treatment. Under National Tuberculosis Programme (NTP) in India, 30% of pulmonary tuberculosis patients are confirmed bacteriologically and the remaining 70% are being diagnosed as active tuberculosis on the basis of X-ray examination (Quarterly NTP Reports, National Tuberculosis Institute (NTI) 1977). In developing countries, 75-85% of pulmonary tuberculosis patients on specific therapy are such 'suspect cases' only (Olakowski, 1974). The question whether it would be correct to treat radiologically active sputum negative tuberculosis patients or to keep them under observation assumes national importance from the clinical, operational, economic and community health point of view. In an attempt to have a clear picture of the issue, a study was designed to follow up two randomly selected groups of 'suspect cases' attending a tuberculosis centre with symptoms — one put on specific treatment, the other on placebo for one year — and determine the comparative incidence of breakdown with bacillary disease or unequivocal radiographic progression during the period.

Plan and Conduct of the Study

Patients

All patients admitted to the study were residents of Bangalore City Municipal Corporation area and had reported to Lady Willingdon Tuberculosis Demonstration and Training Centre (LWTDTC) with symptoms. They had an abnormal shadow on a chest photofluorogram, read as pulmonary tuberculosis (TBP) by the Medical Officer of LWTDTC, a negative direct smear result of one supervised spot specimen of sputum, were aged 12 years or more, had either received no anti-tuberculous chemotherapy at all or had received it for not more than two weeks

and were considered to be physically fit to attend the clinic for out-patient treatment.

The intake of study patients commenced in June 1975, and lasted upto November 1976. In all, the treatment for 4,160 new patients was initiated in LWTDTC of whom 457 who fulfilled the criteria of eligibility were admitted to the study. By a random allocation process, 228 were prescribed the INH + Thioacetazone ('TH') regimen and 229 the Placebo ('P') regimen.

Treatment regimens

The 'TH' regimen consisted of INH 300 mgm and Thioacetazone 150 mgm supplied as two tablets, each containing 150 mgm of INH and 75 mgm of Thioacetazone, to be self administered at home daily in a single dose after the evening meal.

The 'P' regimen consisted of calcium gluconate tablets with an inert dye that appeared exactly like the tablets of INH and Thioacetazone of the 'TH' regimen, to be consumed in the same way as the 'TH' regimen.

The drugs were collected by the patient or his representative every month from LWTDTC.

The study was carried out double blind, neither the patients nor the investigating personnel knew which regimen the patient was receiving.

All patients admitted to the study were allocated by a randomisation scheme to either 'TH' or 'P' regimen. Serially numbered covers each containing 12 packets bearing the same number as that of the cover, sufficient for one year treatment were prepared by the Statistical Section of NTI as per random allocation. All precautions were taken to avoid mixing at the time of packing. These covers were assigned to the eligible patients in the serial order in which they were admitted to the study. The identification particulars of each patient were entered on the cover allotted to him. At each monthly drug collection, care was taken to pick out the correct cover by checking the particulars in the Identity Card of the patient with those entered on the cover. After

From National Tuberculosis Institute, Bangalore.

*T.B. Specialist

**Former Epidemiologist

***Statistical Assistant

Verifying the correctness of the identity, a packet of drug was taken out and issued to the patient.

Investigations on admission to the study

On admission to the study another supervised spot specimen of sputum was collected for direct smear, culture, as well as identification and sensitivity tests of positive cultures at NTI laboratory. The initial photofluorograms which were classified as TBP by the Medical Officer at LWTDTTC, were read separately by the Superintendent of LWTDTTC and a Senior Medical Officer from NTI (Study Readers). In case of disagreement between the two, an umpire reading was done by a third senior reader.

*Follow up examination**

All the patients were followed up by X-ray and single spot sputum examination at the end of 2nd, 4th, 6th, 9th and 12th month. At 12th month an additional specimen of sputum was also collected. The follow up examinations were carried out within one week prior to or after the due date. All sputum samples were examined by direct smear culture as well as identification and sensitivity tests of the positive cultures. The follow up X-ray readings were done jointly by the study readers and in case of disagreement or if definite progression of disease was recorded by both, an umpire reading was made by the third senior reader, whose reading was taken as final. The comparisons made were in respect of both the initial and the immediate previous follow up photofluorograms.

Day-to-Day management

At the time of initiation of treatment, each patient was motivated as detailed in the manuals of District Tuberculosis Programme (DTP). If the patient failed to attend LWTDTTC for drug collection, defaulter actions were taken as per DTP procedures. The drug regimen prescribed to a patient was not altered during the study period. After the 12th month follow up, the patients were referred to LWTDTTC for further management as per routine of the DTP procedures.

If a patient needed referral to a general hospital for conditions other than tuberculosis, he was excluded from the study and all necessary assistance was given.

On follow up examination results, whenever a patient became sputum positive or if the X-ray revealed definite progression of lesion as read by two readers and confirmed by a third umpire reader, he was excluded from the study and transferred to LWTDTTC for further management without any undue delay. The drug covers of all

such excluded patients were sent back to NTI Statistical Section.

Maximum coverage was attempted for all follow up examinations. Sputum samples were either collected at home or at LWTDTTC when the patients came for X-ray examination. Maximum of 3 visits to the patients' home were made within the period specified for each follow up examination. All patients who failed to attend for follow up examinations, were visited irrespective of whether the patient was on 'TH' or 'P' regimen except those who were dead or excluded.

During the follow up, the patients were questioned for any additional anti-tuberculous treatment which they might have taken from another source and was recorded in detail.

Initial Findings

Table 1 reveals that of the total 457 'suspect cases', 144(31.5%) were found bacteriologically positive—49(10.7%) by direct smear and 95 (20.8%) by culture alone on second sputum sample.

The study readers agreed with the initial TBP readings of the Medical of LWTDTTC in 342 (74.8%) patients. Of the remaining in which there was no agreement, 13(2.8%) proved bacteriologically positive in the second sample. Nevertheless, on second sputum sample, out of these 342, 129(37.7%) were found to be sputum positive—46(13.5%) by direct smear and 83(24.2%) by culture alone.

Plan of Analysis

As per random allocation and the initial status of the patients, the study population was divided into six groups (Fig. 1).

Group A and D were cases, found by direct smear on second sputum sample or by culture and therefore usually are not diagnosed in the service programme. These were excluded from further analysis. Group C and F were sputum negatives read as TBP by the Medical Officer of LWTDTTC as well as the study readers and are considered as the 'Main Analysis Group'. Groups B and E were sputum negatives not read as TBP by the study readers and were considered under 'Subsidiary analysis Group'.

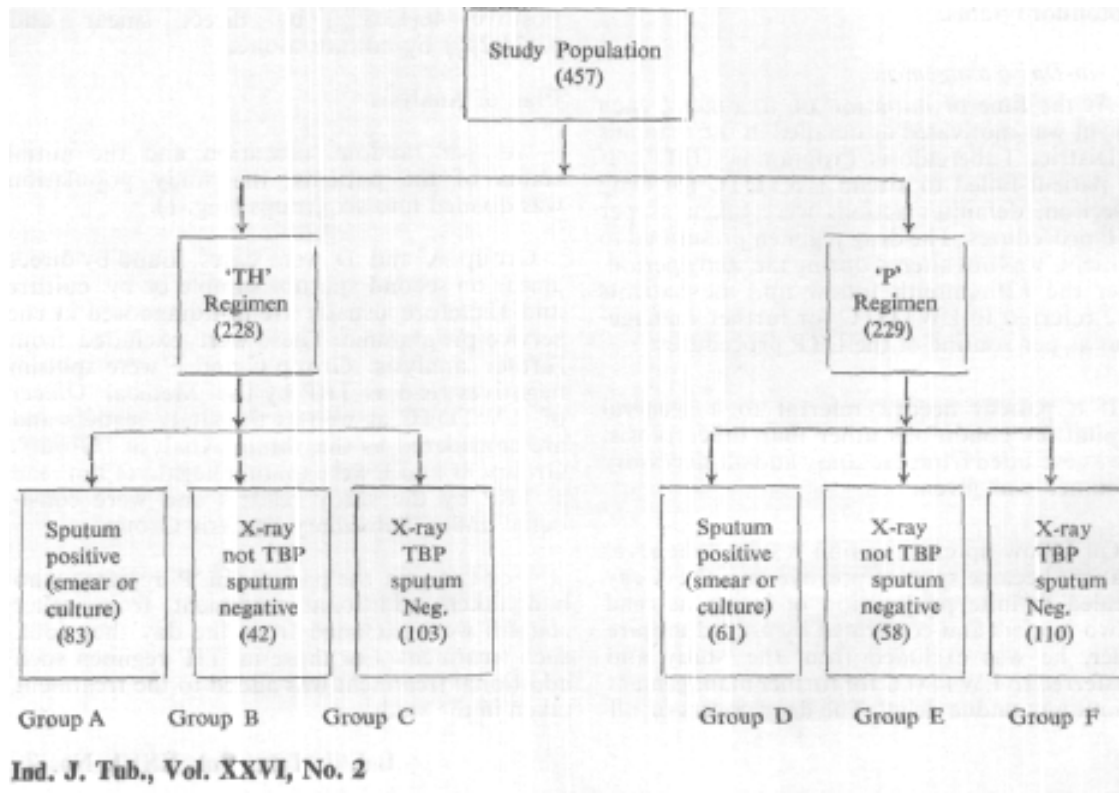
For analysis, the patients in 'P' regimen who had taken additional treatment from other sources were excluded from the day they took such treatment. For those in 'TH' regimen such additional treatment was added to the treatment taken in the study.

Table 1

Initial X-ray Status by Study Readers and Second Sample of Sputum Results.

X-ray reading	Second sample sputum result				
	Negative	Culture only positive	Direct smear only positive	Direct smear culture positive	Total
Pulmonary Tuberculosis	213	83	8	38	342
Lesions requiring observation	50	6	—	—	56
Non-tubercular	31	4	—	—	35
Normal	19	2	1	—	22
Not available	—	—	—	2	2
Total	313	95	9	40	457

Fig. 1

Distribution of Study Population by Analysis Groups

Main Analysis Group

Both the groups were similar in regard to age, sex, extent of disease and duration of symptoms (Table 2).

Table 2

Distribution of the patients in the main analysis group by their initial conditions

	Group C 'TH' (103)		Group F 'P' (110)	
	No.	%	No.	%
<i>Age</i>				
12—24	22	21.4	15	13.6
25—44	44	42.7	60	54.5
45 +	37	35.9	35	31.8
<i>Sex</i>				
Male	67	65.0	64	58.2
Female	36	35.0	46	41.8
<i>Radiological status</i>				
Zones : 1—2	49	47.6	54	49.1
3—6	54	52.4	56	50.9
Cavity : Cavity	20	19.4	18	16.4
No cavity	83	80.6	92	83.6
<i>Symptoms Status</i>				
Cough : <2 weeks	2	1.9	—	—
2—7 weeks	47	45.6	40	36.4
8 + weeks	52	50.5	66	60.0
No cough	2	1.9	4	3.6

The coverages at the follow up examinations at each predetermined time for both the groups were also similar and ranged from 69.7% to 84.8% in group 'C' and from 72.6% to 88.2% in group 'F' at various follow ups.

Case breakdown

The effect of treatment is measured by noting the incidence of breakdown with bacillary tuberculosis or unequivocal radiological progression observed during the treatment period of one year. All the patients in group C who broke down had collected more than 80% of the due drugs

upto the point of breakdown. In Group F, those who had taken anti-tuberculous treatment in between from outside source during the study period were excluded from the analysis from the day the anti-tuberculous treatment was taken. There were 9 such patients.

In Group C, 13 (12.6%) and in group F, 30(29.7%) broke down either with bacillary disease or radiological progression. The difference is statistically significant.

Radiographic progression without sputum positivity occurred among 2(1.9%) in group C and in 9 (89%) in group F.

In Group C, 11(10.7%) and in group F 21 (20.8%) became bacteriologically positive. Further, of the total breakdowns, in group C, among 13 cases, 8(61.5%) and in group F, among 30 cases, 22 (71.3 %) broke down in the first 4 months (Table not given).

Relative risk of breakdown

The relative risk (Armitage, 1973) is the ratio of the risk of incidence of case breakdown between untreated and treated groups studied. It is calculated by the ratio ad/bc where:

a = No. of cases broke down in group F

b = No. remained 'suspect cases' in group F

c = No. of cases broke down in group C

d = No. remained 'suspect cases' in group C

The relative risk so calculated was 2.9 (Table 5). Further, it was 4 in the age group 45 years and above and in males. There was a trend of increasing risk as the age advanced. This, however, failed to attain significance. Similarly, it increased with the increasing extent of the disease. The extent of the disease appeared to be a more important factor than presence or absence of cavitation.

Radiological Behaviour

The radiological assessment was done by comparing the photofluorograms of all the follow up examinations. A patient was eligible for radiological assessment if his photofluorograms of 12th month follow up and 3 other follow ups were available.

The eligibles of both the groups behaved in a similar way. In Group C, 15 (25.4%) and in group F, 9 (17.3%) cleared completely. Probably some of these lesions which cleared quickly were non-tuberculous in nature. Another 14 (23.7%)

Table 3

Coverages far follow up examinations

Month	Group C — TH (103)			Group F P(110)		
	*Eligible	Followed up	Coverage	*Eligible	Followed up	Coverags
2	98	80	81.6	102	90	88.2
4	92	78	84.8	86	74	86.0
6	90	67	74.4	76	61	80.3
9	89	62	69.7	73	53	72.6
12	85	69	81.2	70	57	81.4

*Exclusion: Deaths and excluded patients upto the month.

Table 4

Radiographic Progression and Sputum Postivity in C and F groups during the study period

	Group C TH (103)		Group F P (101)	
	No.	%	No.	%
Direct smear and or culture positive	5	4.9	4	4.0
Culture only Positive	6	5.8	17	16.8
Radiographic Prog- ression only	2	1.9	9	8.9
Total	13	12.6	30	29.7

in group C and 11 (21,2%) in group F showed continuing improvement which perhaps is indicative of self-healine process. The remaining 30 (50.8%) in group C and 32 (61.5%) in group F remained stationary. These were inactive lesions which usually are tuberculous in nature. All in all, both the groups appeared to contain a mixture of active and inactive tuberculous and non-tuberculous lesions. Most of these patients probably did not require the specific treatment.

Subsidiary Analysis Group

In group B (TH' regimen), 2 (4.8%) and in group E ('P' regimen), 8(14.5%) broke down. The breakdown rate as compared with C and F groups is much lower. Here it may be recalled that the study readers read these groups as non-TBP. It confirms the probable more over reading by the programme reader in these groups.

Deaths

The patients in groups E and F who took treatment from other sources and those excluded from the study due to sputum positivity or radiological progression etc. were not followed up from the date of occurrence of that particular event. The comparison of deaths in both the groups was, therefore, not possible. However, a total of 15 patients died during the study period, of whom 6 died in the very first month of admission into the study. The deaths in those put on 'TH' and 'P' regimens were 10 and 5 respectively.

Discussion

Under NTP, in District Tuberculosis Centres (DTC), treatment is offered both to those confirmed by microscopy on single sputum specimen and those suspected to have active tuberculosis on X-ray evidence on single 70 mm photofluorogram but where sputum on direct microscopy is negative. Nagpaul *et. al.* (1974) reported that of all the diagnosed cases in a clinic situation, 43% are 'suspect cases'. There can be variation

Table 5

Relative risk of case breakdown in relation to age, sex, initial, extent of disease and cavitation

Particulars	Group C — TH			Group F — P			Relative risk
	No. observed	Case breakdown		No. observed	Case breakdown		
		No.	%		No.	%	
<i>Age:</i> 12—24	22	3	13.6	15	3	20.0	1.6
25—44	44	7	15.9	53	18	34.0	2.7
45 +	37	3	8.1	33	9	27.3	4.2
<i>Sex :</i>							
Male	67	9	13.4	59	22	37.3	3.8
Female	36	4	11.1	42	8	19.0	1.9
<i>Cavity Status:</i>							
Cavity	20	3	15.0	17	5	29.4	2.4
No cavity	83	10	12.0	84	25	29.8	3.1
<i>No. of zones'</i>							
1—2	49	9	18.4	50	15	30.0	1.9
3—6	54	4	7.4	51	15	29.4	5.2
Total	103	13	12.6	101	30	29.7	2.9

from clinic to clinic but a large number of patients do receive treatment on X-ray evidence of the disease alone, in all the DTCs in the country. What proportion out of these 'suspect cases' are true cases requiring treatment and in what proportion the shadows are non-tuberculous or caused by inactive tuberculosis who do not need specific anti-tuberculous therapy is a dilemma for which conflicting views are expressed (Nair 1974; Bordia, 1974).

From the findings of this study, it can be seen that among the 'suspect cases' attending a DTC of their own, with symptoms, more than

30% are genuine cases who are missed in the programme conditions as neither the second sputum sample examination is done nor the culture facilities are available there. Of the remaining, another 30% developed bacillary disease or progressive radiological lesions if treatment was not offered. Similar results have been reported by other workers also (Frimodt Moller, 1965; Krishnaswamy, 1976). In a DTC, therefore, among all the 'suspect cases' read as 'TBP' by the programme reader, nearly half are genuine cases who need specific treatment. Of the other half who remain sputum negative on direct microscopy, the radiological assessment of the eligible

Table 6

Comparative Radiological Behaviour of C and F group patients during the study period

	Group C(TH)		Group F(P)	
	No.	%	No.	%
Regression leading to clearance	15	25.4	9	17.3
Continuing Regression	14	23.7	11	21.2
Stationary	30	50.8	32	61.5
Total	59	99.9	52	100.0
Not eligible*	44		58	

*Not fulfilling assessment criteria, breakdowns upto 12th month, deaths, etc.

patients showed that lesions of nearly half of them remained stationary, a quarter cleared up completely and in another quarter there was progressive improvement even if the treatment was not offered. It cannot be said with certainty that shadows in all or none of them were etiologically tuberculous. Perhaps they were a mixture of both. Some of them must be inactive cases of pulmonary tuberculosis although it is difficult to prove it unequivocally and objectively on single X-ray interpretation. Nevertheless, most of these patients did not require specific anti-tuberculous treatment.

The risk of case breakdown was three times higher in the untreated, was more in males and in higher age group. It was directly related to the extent of the disease.

The crux of the issue is whether to treat or not to treat the whole group of 'suspect cases' read as 'TBP' by a programme reader. The problem is to be viewed from the point of view of human suffering, epidemiological implications, operational feasibility of alternative approaches and the resources involved. If the treatment is initiated, about less than half of the 'suspect cases' who do not require anti-tuberculous therapy, are unnecessarily put on treatment. It would not only mean wastage of the resources,

delay in the diagnosis of their real ailment, but will also expose these patients to psychological trauma, sociological impediments and hazards of toxicity of the drugs. On the other hand if specific treatment is not offered the genuine cases who constitute more than half of the total 'suspect cases' and who really need the treatment for their suffering, remain unattended. Apart from the question of ethics, it may not be a desirable practice from the epidemiological point of view. In a community study, similar breakdown rates are reported by Gothi et al (1978) on short-term follow up of untreated persons with radiologically active, sputum negative tuberculosis. The results of the longitudinal survey in Bangalore district (Gothi et al. 1978) had revealed that although overall annual incidence of the disease among the persons who were not sputum positive but were judged active or probably active in previous rounds was 26.04 per thousand, yet if the whole group which forms 1.5% of the entire population is treated, 26.6% of the new cases will be prevented. It is, however, difficult to find out this group. Nevertheless 'suspect cases' form a vulnerable group which cannot be taken lightly and left as such without treatment,

The problem, however, is how to pin-point the 'suspect cases' who need the treatment. This is an extremely difficult task. About two-third of the case breakdown recorded in this study was through culture positivity. It is neither possible nor desirable to provide the culture facility in the DTCs for obvious reasons. The additional yield of sputum positive cases on direct microscopy by second specimen collected on two different days is well known (Nagpaul et al 1974). The adoption of such a procedure, however, is operationally difficult in programme conditions. The collection of the second sample on the same day appears to be operationally more feasible. In this study direct smear examination of second spot specimen on the same day had confirmed 10% of the 'suspect cases' as true cases. The second specimen was however examined in a different laboratory. The extent to which this has validity remains to be confirmed. The introduction of this procedure in the programme as a routine, therefore, might help in making definite diagnosis to that extent.

To eliminate most of the non-tuberculous cases, two procedures could be adopted. The first one is to improve the technique of X-ray reading. In this study, when the treatment was not offered, there was a case breakdown of only 15% among group 'E' which was not read as 'TBP' by the expert study readers against 30% in group 'F' where there was agreement of reading between the programme reader and the study

readers. It appears that most of the patients who do not need treatment fall in this group. It may be mentioned that the study readers missed 3% of the genuine cases. Improved technique of X-ray reading, therefore, cannot totally avoid the over-readings. Nevertheless it will certainly narrow down the margin of error. May be that the readings are required to be standardised or may be that exploration of computer technology for proper interpretation of various types of shadows is needed. The possibility of its applicability in the long run consistent with the resources and its availability at various levels should not be lost sight of.

The second procedure could be to put the 'suspect cases' on non-specific therapy and observe them for 3-4 months through repeated sputum examinations. In this study 70% of the total breakdowns occurred in the first 4 months. It would therefore be advantageous to adopt this procedure. Since the risk is more in males, in higher age group and in patients with extensive lesions, such patients, therefore could particularly be kept under strict observation. The operational feasibility of such a measure, however, requires to be studied in depth.

Conclusion

The conclusion which can be drawn from the study is that of all the 'suspect cases' read as 'TBP' in a DTC, who are bacteriologically not confirmed on one spot specimen, about 30% are genuine tuberculosis cases at the very outset and if treatment is not offered, another 20% breakdown with bacillary disease or radiological progression during the period of one year — a major portion in the first 4 months. Only one third of these true cases could be diagnosed if direct smear examination of second sample of sputum is introduced as a routine in the programme.

It would perhaps be appropriate to treat 'suspect cases' both from the clinical and epidemiological point of view. Due precautions should be taken to eliminate the non-tuberculous and inactive cases, as far as possible, from the pool of 'suspect cases' put on treatment in the programme.

Efforts should be made to improve the technique of X-ray reading. No immediate technology, however, is available to narrow down the margin of error.

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ABDOMINAL TUBERCULOSIS AS OBSERVED BY A SURGEON

I.P. ELHENCE*

Despite considerable progress made in the therapy and prophylaxis during the last quarter of the century, tuberculosis of various sites continues to be a major health hazard in India. The precise prevalence of abdominal tuberculosis has not been determined due to lack of a survey in random samples of the population. In our country, intestinal tuberculosis is a relatively common condition (Prakash et al, 1975). It is one of the single largest causes of intestinal obstruction.

This paper relates to our experience with 98 cases of surgically proven tubercular abdomen treated during the years 1976 to 1978 at the Sarojini Naidu Medical College Hospital, Agra, Uttar Pradesh.

Incidence

The total number of patients presenting to us during the above period with subacute or acute intestinal obstruction was 340. Out of these, 236 (69.4%) underwent surgery and 104 (30.6%) were treated conservatively. Of the patients who underwent surgery, 98(28.8%) were found to have abdominal Tuberculosis and 138(40.5%) non-tubercular obstruction. In this group the main causes included volvulus of small intestine, bands and adhesions, inflammatory adhesions, mobile caecum and ascending colon and Meckel's diverticulum etc. Mobile caecum is a fairly common condition in the vegetarian population of India. These cases present with recurring attacks of mild form of intestinal obstruction with vomiting and abdominal distension. Many such cases may receive prolonged antitubercular treatment on the presumed clinical diagnosis of tubercular abdomen with subacute obstruction and as these attacks settle down due to automatic untwisting of caecal volvulus these cases are unnecessarily continued on antitubercular treatment. Surgical exploration is mandatory to refute or confirm the pathology.

Patients who were treated conservatively were 104(30.5%). These were the patients who came with vague symptoms of abdominal pain, distension, diarrhoea, and early subacute obstruction, with no definite clinical picture. These were treated conservatively and most of them settled down with or without antitubercular treatment. It is just possible that some of these cases were suffering from amoebiasis, ileus

secondary to urinary calculi, intestinal colic or were early cases of abdominal tuberculosis. It was difficult to prove their aetiology, and they were all discharged after a short hospital stay.

The maximum incidence of abdominal tuberculosis was during the second decade (59 cases). The sex incidence was almost equal with females slightly predominating.

Clinical Features

(i) Abdominal tuberculosis leads to a spectrum of clinical profiles. At one end is the typical clinical picture of tubercular subacute obstruction with abdominal pain, visible peristalsis, vomiting, difficulty in passing flatus and faeces, general ill-health, toxæmia and pyrexia. The type of abdominal tuberculosis in these cases was either the ileocaecal hypertrophic variety with a palpable lump in the lower abdomen or tubercular small bowel strictures. This group comprised of 58 cases.

(ii) The second group of patients had more acute symptoms (26 patients). This group presented with acute abdominal pain, tenderness, abdominal distension, signs of peritonitis and shock. These patients had acute symptoms superimposed on pre-existing subacute or chronic abdominal symptoms. Here, the type of abdominal tuberculosis was either miliary, plastic adhesive variety or perforation above a tubercular ulcero-constrictive lesion.

(iii) The other mode of presentation was with abdominal pain, anaemia, weakness and palpable mesenteric lymph nodes (14 cases). This group of patients needed exploratory laparotomy to confirm tubercular pathology and exclude lymphomas. Laparotomy was therefore mandatory. The duration of symptoms varied in the subacute obstruction group from one month to 3 years. It was 2-6 months in 26 patients. In the acute group the symptoms ranged from 1 to 15 days whereas in the third group the symptoms ranged from 1 to 3 months.

Patients of abdominal tuberculosis before they come to a surgeon have already had antitubercular treatment for varying lengths of time. Most of these suffer from subacute obstructive symptoms. Therefore, any diagnostic study in the form of Barium Meal examination is not recommended once subacute or recurrent

*Department of Surgery, S.N. Medical College, Agra.

Table 1

Duration of Symptoms

1. <i>Subacute Obstruction Group</i>	..	58 Cases
1—2 Months	:	10
2—6 Months	:	26
6—12 Months	:	9
1—2 Years	:	8
2—3 Years	:	5
2. <i>Acute Obstruction Group</i>	..	26 Cases
1—7 Days	:	16
7—15 Days	:	10
3. <i>Abdominal Pain with Mesenteric Lymph node mass</i>	..	14 Cases
Upto 1 Month	:	4
1—3 Months	:	10

abdominal pain bouts start. Clinical features like abdominal distension, visible peristalsis, palpable lump in the right lower abdomen, and difficulty in passing flatus are sufficient to warrant an exploratory laparotomy.

Diagnostic Criteria

91 patients underwent exploratory laparotomy. The diagnosis of abdominal tuberculosis was made in 26 cases on the basis of intra-operative features like the presence of single or multiple strictures, enlarged mesenteric lymph nodes some of which showed caseation, presence of tubercles scattered over intestinal serosa, peritoneum or omentum and presence of ascitic fluid.

In another 65 cases, in addition to intra-operative findings supporting abdominal tuberculosis, biopsy from either the bowel, mesenteric lymph nodes or omentum was sent for histopathological examination. Biopsy proved cases of abdominal tuberculosis were 43 where the histological evidence of tuberculosis was presence of tuberculous enteritis, tubercular lymphnoditis and evidence of tuberculosis in the omentum. Tubercular lymphnoditis was present in maximum number of patients (31).

In 22 cases either the bowel exhibited strictures (5 cases) or there was mesenteric lymph-node enlargement (17 cases), the biopsy was negative for tuberculosis. It was non-specific

enteritis in 5 cases and hyperplastic lymphnoditis in 17 cases.

However, in another 7 patients, the diagnosis of abdominal tuberculosis was made on the basis of abdominal symptoms and presence of tuberculosis elsewhere in the body *e.g.* pulmonary tuberculosis^ tuberculous spine, tubercular meningitis, calcification in the mesenteric lymph-nodes and presence of tubercular axillary or inguinal lymphnodes.

Pathological Features at Laparotomy

Bowel tuberculosis does not exist alone; mesenteric lymph node enlargement is invariably present. Peritoneum and bowel serosa are also involved and ascitis may also be present.

Ileocaecal tuberculosis with a lump was present in 25 cases. This lump was associated with ileal strictures in 6 cases, miliary tuberculosis in 8 cases and carcinoma caecum in 1 case. In 10 cases there was no macroscopic bowel involvement and only mesenteric lymph nodes were enlarged.

Small bowel tubercular strictures were detected in 33 cases. These were single in 20 patients and multiple (upto 2-6) in 13 cases. The strictures were mostly in ileum (28 cases) but a few were also in the jejunum (5 cases). There was no involvement of colon and duodenum in our series. Only ileal strictures were present in 20 cases, ileal stricture and miliary tuberculosis in 4 cases and ileal stricture with caseation in the mesenteric lymph nodes in 4 cases.

On gross examination the caecum was thickened and deformed, similar pathological change extended into the ascending colon and the terminal portion of ileum. In addition in some cases tubercles of varying size also covered the serosa of the involved ileum and caecum. Circumferential tubercular strictures were found in the small bowel.

Management

Once obstructive symptoms appear, surgery is unavoidable. This was offered to 91 patients. Tubercular strictures were either resected (11 cases) or the stricture bearing segment of the bowel was bypassed by a ileo-ileal anastomosis (9cases). The ileo-caecal lumpcases were subjected to either right hemicolectomy (17 cases) or a limited ileo-caecal resection (12 cases). Operative details are given in table 2.

Conservative treatment had to be followed in 7 cases of abdominal tuberculosis who had

Table 2

1. <i>Operative Management</i>	91 Cases
1. Ileotransverse anastomosis		14 Cases
2. Right Hemicolectomy		17 Cases
3. Limited Ileocolonic Resection		12 Cases
4. Resection of ileal strictures		15 Cases
5. Bypass of ileal strictures		12 Cases
6. Laparotomy + separation of adhesions		6 Cases
7. Laparotomy +L-N. biopsy		14 Cases
8. Stricture plasty for Multiple strictures		1 Case
2. <i>Conservative Management</i>	7 Cases
These had tuberculosis elsewhere in the body also. Treated and settled on conservative treatment.		

evidence of tuberculosis elsewhere in the body. They all settled down on this regime. Even after surgery, conventional antitubercular treatment has to continue for 12-18 months.

11 cases out of 98 cases treated, died due to various complications which included faecal fistula, persistent shock, fluid electrolyte imbalance, wound infection and dehiscence.

Discussion

To a surgeon, cases of abdominal tuberculosis come either in the subacute stage of intestinal obstruction or in the acute stage. Occasionally a patient comes or is referred to a surgeon with enlarged abdominal nodes, general weakness and low grade pyrexia. In all these situations exploratory laparotomy becomes essential to confirm the diagnosis and to relieve the nature of obstruction.

Once subacute attacks of pain and obstruction develop antitubercular drugs will not help. The therapeutic trial of antitubercular drugs in a patient with only abdominal symptoms and no other evidence of tuberculosis elsewhere in the body, may be justifiable according to some people but the antitubercular chemotherapy is not justified unless the diagnosis of abdominal tuberculosis is confirmed first. Many a times, on the mistaken diagnosis of subacute tubercular obstruction, antitubercular drugs are given for a long time only to realise in the end that the cause of trouble was mobile caecum and/or ascending colon and therefore in such a case the antitubercular therapy seems unjustifiable.

The intestinal strictures of tuberculosis

usually do not pose any diagnostic problems as they are quite distinct from the tubular involvement of Crohn's disease. The colonic and duodenal involvement in tuberculosis is very infrequent (Prakash et al, 1978). In our series there was no such involvement.

The presence of caseating granulomas in the bowel lesions and the demonstration of acid fast bacilli in the tissue or isolation of tubercle bacilli by culture have been emphasised as the essentials for the diagnosis of intestinal tuberculosis. According to Tandon & Prakash (1972) these criteria cannot always be fulfilled.

Bacteriologically proven lesions may also sometimes fail to demonstrate caseation necrosis. The characteristic granuloma may be completely missed if the draining lymphnodes are not properly studied (Hoon *et al*, 1950; Hancock, 1958). Disappearance of caseation necrosis from tuberculous lesions on antitubercular chemotherapy has also been reported (Wig *et al*, 1954). Bowel changes of Crohn's disease may well be due to modifications of tubercular enteritis by antitubercular treatment, high host resistance or the low virulence of organisms.

Due to chemotherapy of tubercular bowel lesions, characteristic granulomata may disappear from the intestine but are always present in the active or healed form in the mesenteric lymphnodes (Tandon *et al*, 1966; Tandon & Prakash, 1972).

Histologically the cases showing frank caseation, giant cells, epithelioid cells and round cells are accepted as tubercular by all workers. Those exhibiting no caseation but with giant cells and epithelioid cells are also taken as tubercular by many workers (Anand, 1961; Atm Prakash, 1970). Some cases show non-specific type of round cell infiltration in the bowel wall or the lymphnodes. Many workers include such cases among the tubercular group for the reason that they had received antitubercular treatment (Bhansali, 1970; Wig, 1954). Apart from this in some sections of the bowel a typical caseous tubercular picture may be present in one part and in another part of the same bowel, inflammation of the non-specific type may be seen.

Abdominallymph nodal and peritoneal tuberculosis may also occur without gastrointestinal involvement as reported by Bhansali *et al*.(1978) in 1/3rd of their cases of abdominal tuberculosis.

Diagnosis of abdominal tuberculosis short of subacute obstruction is difficult because at this stage of the disease the symptoms are vague,

signs, non-specific and investigations not pathognomonic. With a history of preceding pulmonary tuberculosis, abdominal involvement is suspected if the patient complains of abdominal pain with altered bowel habits and low grade pyrexia without any deterioration of the lung picture. In the absence of pulmonary tuberculosis, onset of chronic abdominal pain, anorexia, fever, alteration in bowel habit and malabsorption are pointers towards tubercular abdomen (Bhansali, 1978).

Radiology helps in the diagnosis of most of the ileo-caecal or colonic tuberculosis cases but only a few small intestinal lesions are picked up by radiology. Enlarged mesenteric lymph nodes with pyrexia and ill-health may be tubercular in origin. The diagnosis of lymphoma should and must be excluded in such cases. In such cases therapeutic trial of antitubercular therapy may be given by some clinicians but the role of exploratory laparotomy is unsurpassable.

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ABDOMINAL TUBERCULOSIS

PREM MUKERJEE* and RAVI RAJOR**

Tuberculosis of abdomen is a very common disease in India. 557 cases of abdominal tuberculosis were admitted in the Department of Surgery, Lady Hardinge Medical College & Hospital, New Delhi from 1964 to 1975.

The disease is declining in recent years with improved medical services, frequent health surveys and easy availability of antitubercular drugs. Abdominal tuberculosis can effect any part of gastrointestinal tract from stomach to the rectum. In our study we had cases all varieties of abdominal tuberculosis *i.e.* stomach, small bowel, ileocaecal, large bowel, peritoneal, tabes-mesenterica and encysted variety.

Material and Methods

In this study of 11 years, 557 cases of various forms of abdominal tuberculosis were investigated in the following manner:-

1. Detail symptomatology and clinical findings were noted.
2. Blood examination.
3. X-Ray of the chest.
4. Examination of gastrointestinal tract by barium meal or barium enema. In certain cases both were done.
5. Histological examination of pathological specimen.

In the present series all cases were females as Lady Hardinge Hospital only admits female patients and children.

The following table shows the age groups in our series.

Age	Total No. of cases
10—20	155
21—30	252
31—40	92
41—50	32
51—60	26

The maximum number of cases were in the age group of 21-30 years.

Symptomatology and clinical findings are shown in charts I and II.

Chart I : Symptoms

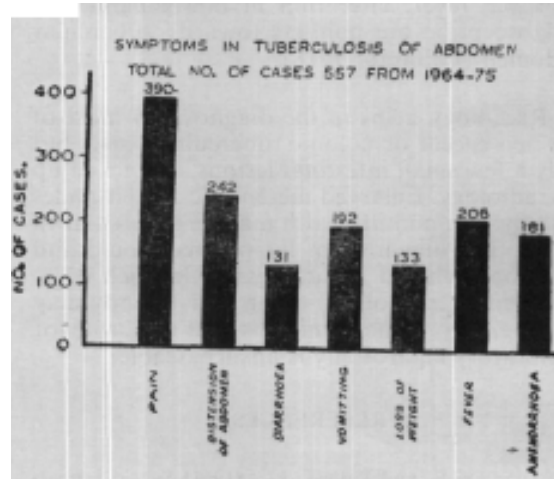
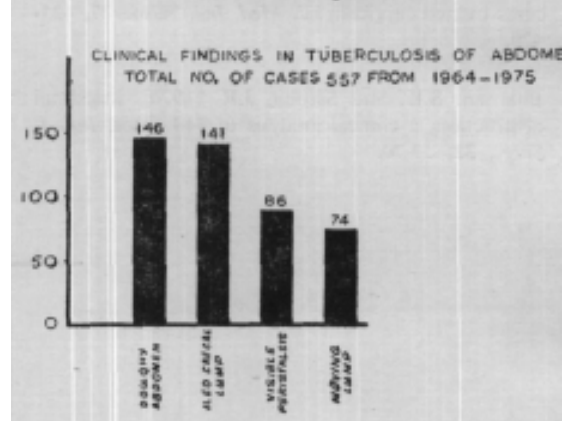


Chart II : Signs



Symptomatology

The main symptom was pain in the abdomen. It varied in nature from dull ache to intermittent colicky pain. The next common symptom was distension of abdomen. This was more common in stenotic and cicatrising variety. Low grade temperature was another common symptom. Vomiting was an early feature in small bowel lesions. Intermittent diarrhoea and constipation occurred in some of the cases and constipation

*Professor of Surgery, Lady Hardinge Medical College & Hospital, New Delhi.

**Senior Surgeon, Madar Union Sanatorium & Hospital, Ajmer.

was the only presenting symptom in another group of patients.

Clinical Examination

Majority of the cases were poorly nourished and were thin built. The commonest sign was doughy abdomen. Ileocaecal lump was present in 141 cases. Visible peristalsis and moving lump in the abdomen was observed in less percentage of cases.

Investigation

All cases had varying degree of anaemia revealed by haemoglobin estimation; about 80% of cases had 8-10 grams of haemoglobin per 100 cc of blood. Total leucocytic count was within normal limits. Basal sedimentation rate was raised above 15 mm Westergren in 85% of cases.

X-ray Examination

Barium meal and barium enema were main radiological examinations carried out. These are shown in Fig. I & II which reveal typical appearance of tubercular lesion seen in small bowel and ileocaecal region.

FIG. I,



Barium meal showing skipped pulled up caecum and narrow ascending colon

FIG. II.

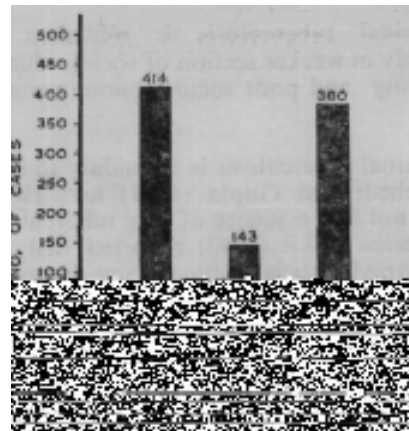


Barium Enema showing two strictures in the transverse colon

Diagnosis

Operation was performed in 414 cases in the present series. In 380 cases the diagnosis was confirmed at operation and by pathological examination. Chart III shows the criteria on which the diagnosis was based. In 34 operated cases histology was not done.

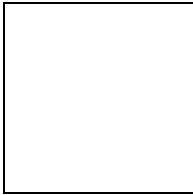
Chart III : Modes of Diagnosis



Operations

Hemicolectomy one or two stages was done for ileocaecal type of lesions and resection was carried out in ileal lesions. Gastro jejunostomy was done in 2 cases of gastric tuberculosis. Only laparotomy could be done in the rest of the cases where miliary tuberculosis, plastic tuberculosis, encysted type of tuberculosis and tabes mesenterica were found. It was not possible to do extensive procedures except to take biopsy and divide adhesions wherever possible. Operations performed are shown in chart IV. Figures III and IV shows the typical cases in which excisional surgery was done.

Chart IV : Different Operations Performed



Results

After the operation patients' general condition improved due to relief of symptoms and they gained weight. They were followed in the follow up clinic. The overall results of surgery were satisfactory.

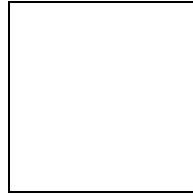
Discussion

Abdominal tuberculosis is prevalent in India mainly in weaker section of society due to overcrowding and poor socio-economic conditions.

Abdominal tuberculosis is secondary to lung lesion. Trebedi and Gupta (1941) and Hoon (1950) did not find evidence of lung tuberculosis in their series. Ukil (1942) reported that 5.1 per cent carried associated lung lesion. However in our present series there was evidence of lung tuberculosis in 9 per cent of cases.

The highest age incidence in the present series was between 20-40 years. The most frequent

FIG. III.

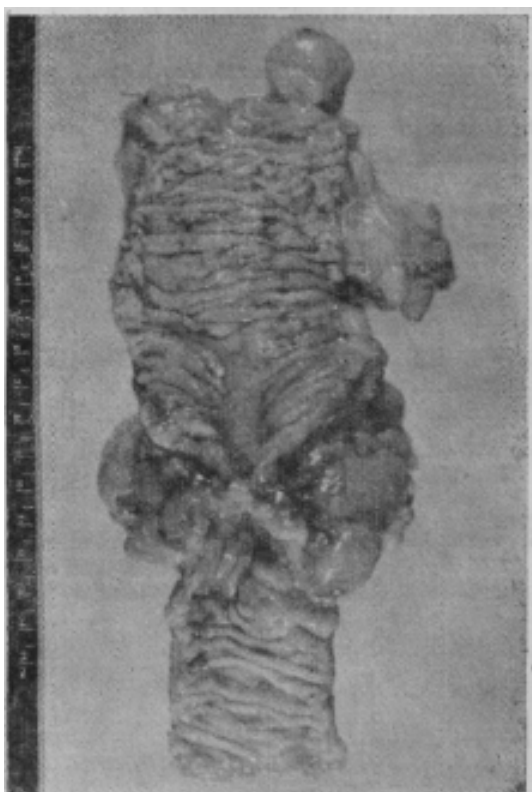


Gross photograph of opened out Ileum. It shows 4 strictures on the mucosal surface (shown by arrows). Note the loss of mucosal folds at the site of stricture.

period of onset of gastro-intestinal tuberculosis is between 20 and 40 years. Rankin (1952) reported the incidence slightly higher in women. The present series consists only of female patients.

The commonest variety of abdominal tuberculosis is hypertrophic ileocaecal lesion. In our series 197 cases were of ileocaecal tuberculosis. Clinically and pathologically Crohn's disease and hypertrophic tuberculosis have many things in common. The age incidence, pain, low grade pyrexia, lump in the abdomen and obstructive symptoms are common in both diseases. Naked eye & radiological features also fail to distinguish between the two conditions. Typical caseation necrosis may or may not be present in the lesion. The caseation necrosis either in the lesion itself or the lymph nodes have been the criteria of diagnosis in our series. Wig & others (1953) were of the opinion that regional ileitis may be a stage in the healing process of tuberculosis. We have at times seen

FIG. IV



Gross photograph of opened out Ileocecal region. It shows stricture. The mucosa at the stricture site is thickened due to hypertrophy.

similar changes when patients have been operated in two stages. At the time of first operation besides a by pass operation a lymph node biopsy taken showed caseation necrosis on the basis of which diagnosis of tuberculosis was made. The patient was then put on chemotherapy for tuberculosis and at the second operation, the right hemicolectomy specimen has shown absence of caseation on histopathological examination. Tuberculosis of large bowel is not a common disease beyond caecum and ascending colon. The ulceration of the entire colon was reported in 1963 by Virmani from our hospital. We also reported another series Chawla *et al* (1966) of segmental tuberculosis of the colon. Of the 62 cases collected from the world literature by Hancock (1958). The sigmoid colon was involved in 37 cases. We had 5 patients of distal colon involvement in the present series. The commonest site of lesion was transversal colon. Segmental tuberculosis can occur anywhere in the distal colon. The common reported site is in the sigmoid colon in the world literature.

Tuberculosis of the stomach is very rare. Isolated case reports of the tuberculosis limited to the stomach have appeared in the Russian literature (Kuzinov and Polinkova 1973) and *Wigetal'm* 1961 literature. In Western literature only rare case reports by Stick (1968) and Page *et al* 1975 have appeared.

A chlorhydria is a frequent finding in case of tuberculosis of the stomach. We had 2 cases of tuberculosis of pyloric region.

Tabes mesenterica was mainly reported in children (Aird 1957 and Maingot 1970). It is widely appreciated now that the disease is quite frequent in adults also. In our series we found 27 cases. Few of these presented clinically with lump in the abdomen. In other cases diagnosis was made only at the time of laparotomy.

Small bowel lesions were seen in 90 cases. Few of the cases were multiple lesions. Stricture formation following ulceration of ileum has been seen but ileocaecal junction is the commonly described lesion in the literature.

Summary

557 cases of abdominal tuberculosis have been presented. The lesion was commonest in the ileocaecal region. 414 cases were treated surgically. In our series we demonstrated cases of colonic lesion and 2 cases of gastric tuberculosis. The literature has been reviewed.

Acknowledgement

We are grateful to Dr. S. Achaya, our Principal for her kind permission to publish this paper. We also thank our interns who helped us in collecting the data, the artist of the Anatomy Department and college photographer for their help in preparing the charts and photographs.

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ROLE OF CIRCULATING ANTIBODIES IN PULMONARY TUBERCULOSIS

DEEPAK CHOUDHARY*

Diagnosis of pulmonary tuberculosis in the absence of positive sputum is always equivocal. The object of the study now being reported was to find out whether serum agglutination tests (SATs) could provide a solution to this problem. Is there a critical dilution that could be considered sufficiently specific for diagnosing active pulmonary tuberculosis?

The study was carried out at the New Delhi TB Centre on the following four groups of patients :

Group I	Active Pulmonary Tuberculosis patients, positive by direct microscopy	48
Group II	Clinically & Radiologically Active Pulmonary Tuberculosis patients negative by direct microscopy	
Group III	Treated Pulmonary Tuberculosis patients rendered inactive after chemotherapy	23
Group IV	Non-tuberculous patients	20
	Total	116

In all 116 persons were included in the study. There were no major age or sex differences between the various groups. Nearly 3/4th were males and about the same percentage belonged to the 25 to 35 years age group. SAT was carried out with 7 dilutions ranging from 1/16 to 1/1024.

Results of the S.A.T.s for the four groups of patients have been charted in table 1. It would be seen that most cases in groups I, II & III are

concentrated towards the right side *i.e.* in 1/128 or higher dilutions whereas most cases in group IV are towards the left *i.e.* 1/64 or lower dilutions.

Whatever dilution one uses there are two kinds of error *viz.* false negatives and false positives. Shifting the critical dilution to reduce one kind of error inevitably leads to an increase in the other kind of error. The solution obviously lies in trying to minimize the overall error by balancing the two. For this purpose the data from table 1 were analysed to show in table 2, the comparative proportion of cases correctly classified and mis-classified if one or the other dilution was adopted as the critical threshold.

One can see from table 2 that although the percentage of correct classifications keeps on rising in groups I, II & III as one proceeds from right to left, an overwhelming majority are correctly classified by the 1/128 dilution and no substantial advantage is gained by proceeding further left. For group IV too, consisting of non-tuberculous patients, 95 % of the persons are correctly classified by the same dilution and very little is gained by going further right.

Comparison of data relating to groups I & II shows that there are no statistically significant differences between these two ($X^2=1.92$ for 3 d.f.; $P>0.50$). Whereas this cannot be regarded as conclusive proof, there is at least a strong suggestion that the two groups are in fact similar enough to be considered together for further analysis.

Reverting to the main problem, it is obvious

Table 1

Patients classified according to minimum dilution to which they were positive by serology

Group	Neg	1/16	1/32	1/64	1/128	1/256	1/512	1/1024	Total
I	—	2	—	1	10	12	16	7	48
II	1	1	1	1	7	6	6	5	28
III	—	—	1	1	—	2	8	8	20
IV	11	2	3	3	1	—	—	—	20

*Postgraduate student, New Delhi Tuberculosis Centre. Jawaharlal Nehru Marg, New Delhi-110002.

Table 2

Correct classifications obtained with various dilutions (Percentages)

Group	1/16	1/32	1/64	1/128	1/256	1/512	1/1024
I	100.0	95.8	95.8	93.7	72.9	47.9	14.6
II	96.4	92.8	89.3	85.7	60.7	39.3	17.8
III	100.0	100.0	95.0	90.0	90.0	80.0	40.0
IV	55.0	65.0	80.0	95.0	100.0	100.0	100.0

that for distinguishing groups I & II from group IV, the dilution 1/128 appears to be the most satisfactory one as the errors of misclassification are respectively 6.3% 14.3% and 5.0% in the three groups. Shifting the critical dilution to, say, 1/256 changes these errors to 27.1%, 39.3% and 0.0%, whereas shifting it to 1/64 changes them to 4.2%, 10.7% and 20.0% respectively. Clearly, neither of these alternatives can be considered satisfactory.

The next question is whether serology can also help discriminate between patients with active and inactive tuberculous lesions in the lung. Reference to groups I & III in table 2 again shows that none of the dilutions can help distinguish between these two groups.

Let us now consider the feasibility of trying to diagnose patients attending a chest clinic on the basis of direct microscopy of the sputum and a S.A.T. For example, the total number of persons reporting at the New Delhi Tuberculosis Centre from the domiciliary treatment area during 1977, group-wise, was as follows :-

Group I	425
Group II	552
Group IV	2,280
	3,257

Group III cases (inactive) are excluded since they form a small and relatively insignificant fraction of total symptomatic patients.

All patients in group I would be diagnosed by direct microscopy of the sputum. For patients from group II & IV one would have to depend entirely on serology and the numbers correctly classified would naturally vary according to the

critical level adopted. The situation, as it would obtain, with three different dilutions using the percentages of false negatives and positives found in the present study, is summarised in table 3.

Table 3

Correct classifications obtained with a combination of direct microscopy of sputum and serology

	Total patients	Current classifications		
		1/64	1/128	1/256
Group I	425	425	425	425
Group II	552	493	473	335
Group IV	2,280	1,824	2,166	2,280
Total	3,257 (100%)	2,742 (84.2%)	3,064 (94.1%)	3,040 (93.3%)

It will be seen that there is very little to choose between the dilutions 1/128 and 1/256. However, if one analyses the composition of the misclassifications one would probably still prefer 1/128. The dilution 1/128 errs on the side of caution missing only 79 (8.1%) of the 977 TB cases while wrongly labelling as TB (and consequently over-treating) 114(5.0%) of the 2280 non-tuberculous patients. The dilution 1/256 on the other hand would correctly classify the entire lot of 2280 non-TB patients but would miss 217 (22.3%) of the TB cases. The balance of advantage, thus, still rests in favour of the 1/128 critical dilution.

Conclusions

The following conclusions can be drawn from the foregoing analysis:-

1. Serology can with advantage be used in the diagnosis of pulmonary tuberculosis. The dilution best capable of discriminating between a tuberculous and non-tuberculous case appears to be 1/128.

2. When combined with direct microscopy of the sputum, the serum agglutination test can correctly classify nearly 92% of the patients attending a chest clinic while wrongly labelling as tuberculous nearly 5% of the non-tuberculous patients.

3. In as much as it is possible to judge from the results of the SATs, groups I & II appear to be very similar to each other suggesting that, at least serologically, patients diagnosed on clinical and radiological basis are similar to those in which bacteriological evidence of TB was available in addition.

4. From the rather limited data at our disposal it is not possible to distinguish between active and inactive tuberculosis on the basis of serology.

Acknowledgement

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B.C.G. TEST

K.V. KRISHNASWAMI*, M. ABDUL RAHIM,** R. PARTHASARATHY,*** and M.A. RAJA****

Introduction

In recent years several studies, especially by paediatricians (Udani *et al*, 1961, Ayer *et al*, 1973, Chandra, K. *et al*, 1977, Shrivastava *et al*, 1977) have commended B.C.G. Test as a superior test for the detection of the presence of tuberculous infection in individuals. At present Tuberculin Test with 1 TU PPD RT 23 with Tween 80 is used for detection of infection. In view of the harmlessness of the BCG test, and the claims made, it was considered desirable to have this investigated.

Material and Methods

The study was conducted at the Chest Institute, Madras during a period of two months from 1st March 1978. A total of 637 persons were included.

Criteria for Selection

- a. New chest symptomatics irrespective of age;
- b. Without BCG Scar;
- c. from the feeder area of the Institute;
- and d. co-operative and willing to attend daily for 7 days.

Exclusions

Persons with complications and concomitant diseases were excluded.

A proforma designed for this study was filled in for every one of the study subjects. All the details including the readings of different days were duly entered. The selected persons were given simultaneously BCG Vaccination on the left upper arm (Deltoid region) and Tuberculin test on the right forearm (anterior aspect) on the day of first attendance. On the subsequent seven days the induration sizes were read and recorded. Testing and reading were done by two experienced and trained persons. Previous days' readings were not made available to the reader at the time of reading on any day to obviate any bias. The study was conducted in two stages, the first one with 1 TU PPD RT 23 with Tween 80 and the second one with 5 TU PPD RT 23 with Tween

80. For both the stages same batch of BCG freeze-dried vaccine was used.

The persons included in the study were subjected to radiological and/or bacteriological examinations. The cases detected were put on specific treatment only after the conclusion of the study.

Results

Table I

Study Data

	1T.U.	5T.U.
Number Tested	292	431
Incomplete Data	38	48
Number Analysed	254	383
Coverage	87.0%	88.9%

292 and 431 persons were tested with 1 TU and 5 TU PPD RT 23 with Tween 80 respectively, all having been tested with B.C.G. simultaneously.

Excluding persons with incomplete data the overall coverage was 88%.

Comparing the percentage infected at different levels of induration size of tuberculin test with PPD RT 23 with Tween 80 read on the third day with the BCG proportions on different days and taking 10 mm induration size with tuberculin test on the third day, the degree of correlation of BCG test of VI day is fairly high, *viz.* 45.3% as against 43.7% indicating that the best choice of day for reading BCG induration to demarcate the infected would be the VI day.

The different levels of induration size of tuberculin test with 5 TU PPD RT 23 with

*Professor and Head of the Department of Tuberculosis and Chest Diseases, Madras Medical College and Director, Government Chst Institute & Clinics & Tuberculosis Demonstration & Training Centre, Chetput, Madras-600031;

**Foidemiologist

***Statistician

****Senior House Surgeon

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Table II

MX(1 TU) — BCG — % Infected — Induration Level

Induration Level (MM)	Tuberculin 111 Day	B.C.G. of different days				
		III	IV	V	VI	VII
>8	48.8	66.1	65.7	61.8	49.2	27.2
>10	43.7	61.4	61.8	57.1	45.3	41.7
>12	30.7	50.4	52.8	46.1	36.6	33.1
>14	19.7	32.7	39.4	32.7	22.8	20.5
>6	8.3	15.4	18.1	16.5	11.4	8.7

Table III

MX(5 T.U.) — B.C.G. — % Infected — Induration Level

Induration Level (MM)	Tuberculin III Day	B.C.G. of Different Days				
		III	IV	V	VI	VII
> 8		67.4	66.6	62.7	54.8	46.7
—		59.5	60.8	57.4	47.5	37.9
	44.9	45.4	47.5	45.2	35.2	23.2
>14	33.4	28.2	31.3	27.2	18.8	12.3
>16	17.8	16.2	16.7	12.5	9.7	4.7

Tween 80 read on the third day comparing with the BCG proportions on different days and taking 10 mm. induration size with tuberculin test on the third day, the degree of correlation of BCG of V day is fairly high, viz. 57.4% as against 56.9% indicating that the best choice of day for reading BCG induration to demarcate the infected would be the fifth day.

The relative sensitivity, *i.e.* the proportion of BCG reactors among the Tuberculin (1 TU) reactors and the relative specificity, *i.e.* proportion of BCG non-reactors among the tuberculin non-reactors in the population, at different levels of BCG vaccination induration on different days of reading for demarcating the infected was studied. The size of BCG Vaccination lesion giving the highest value for both relative sensi-

vity and specificity, viz. 76.6% and 76.9% which falls at the 10 mm or more level of BCG induration on the sixth day is the best level for demarcating the infected.

A similar approach with regard to Tuberculin 5 TU shows that the optimum of sensitivity and specificity of BCG of 86.2% and 80.6% occur on V day at the level of 10 mm and more leading to the derivation of it as the demarcation for the placement of infection.

The B.C.G. curve shows a fairly clear Bimodal pattern.

There is an approximation between the two curves from the second mode.

Table IV
MX (1 T.V.) — B.C.G. — Relative Sensitivity and Specificity

Induration Level (MM)	III Day		IV Day		V Day		VI Day		VII Day	
	RS	RSP	RS	RSP	RS	RSP	RS	RSP	RS	RSP
> 8	95.5	56.6	92.8	55.2	86.5	57.3	65.5	71.3	75.7	74.8
> 10	92.8	62.9	89.2	59.4	84.7	64.3	76.6	76.9	69.4	79.7
> 12	84.7	76.2	86.7	72.0	74.8	76.2	63.1	83.2	62.3	89.5
> 14	60.4	88.8	68.5	83.2	54.1	33.9	42.3	92.3	39.6	94.4
> 16	30.6	96.5	36.0	95.8	29.7	93.7	21.6	96.5	18.9	99.3

Table V
Mx(5 TU) — B.C.G. — Relative Sensitivity and Specificity

Induration Level (MM)	III Day		IV Day		V Day		VI Day		VII Day	
	RS	RSP	RS	RSP	RS	RSP	RS	RSP	RS	RSP
> 8	92.2	65.5	95.0	70.9	90.8	74.5	81.2	80.0	71.1	85.5
> 10	86.7	76.4	90.4	78.2	86.2	80.6	74.3	87.9	58.7	89.7
> 12	70.2	87.3	74.8	68.5	70.2	87.9	56.9	93.3	38.5	97.0
> 14	45.4	94.5	51.4	95.2	43.1	93.9	31.7	98.2	20.6	98.8
> 16	28.0	99.4	28.4	98.8	21.6	99.4	16.5	99.4	8.3	100.0

Table VI
MX (1 T.U.) and B.C.G. — Cases Detected

B.C.G.	Tuberculin					
	Reactor (>10 MM)			Non-Reactors (<10 MM)		
	Normal	Diseased	Total	Normal	Diseased	Total
Reactors > 10 MM	6 (55.6%)	21 (94.0%)	27	10 (14.3%)	4 (36.4%)	14
Non-Reactors < 10MM	3 (44.4%)	4 (16.0%)	7	60 (85.7%)	7 (63.6%)	67
Total	9	25 (69.4%)	34	70	11 (30.6%)	81

Table VII

B.C.G.	Tuberculin					
	Reactors (>10MM)			Non-Reactors (<10 MM)		
	Normal	Diseased	Total	Normal	Diseased	Total
Reactors >10 MM V Day	26 (92.9%)	54 (85.7%)	80	16 (15.8%)		16
Non-Reactors /_ 10 MM V Day	2 (7.1%)	9 (14.3%)	11	85 (84.2%)	6 (100. %)	91

With B.C.G. there appears to be a slight over diagnosis which is not of statistical significance.

Analysing the Tuberculin and BCG Reactions in persons with disease under the age of 20 years, it is observed that 84% were BCG positive and 16% were BCG Negative among Tuberculin reactors. Among the Tuberculin Non-reactors 36.4% were BCG Positive and 63.6% BCG Negative.

The synchrony of BCG and Mantoux Positivity occurs 23.5% and Negativity of both in 58.3%. Overall BCG and Mantoux have similar results in 81.8%.

Of the total diseased persons 58.3% had shown both BCG and Mantoux Positivity and of the normals 75.9% had shown both BCG and Mantoux Negativity,

Of the diseased 69.4% were reactors to Tuberculin against 69.5% reactors to BCG.

19.4% of the diseased persons have been negative by Tuberculin test and BCG test.

In this table Tuberculin 5 TU and BCG reactions in persons below the age of 20 years with disease, it is seen that 85.7% were Positive and 14.3% Negative to BCG among Tuberculin Reactors. All the non-reactors of Tuberculin were negative to BCG also.

The synchrony of BCG and Mantoux Positivity occurs in 40.4% and Negativity of both in 45.95%. Overall BCG and Mantoux have similar results in 86.35%.

Of the total diseased persons 78.26% had shown both BCG and Mantoux Positivity and of the Normals 65.89% have shown both BCG and Mantoux Negativity.

Of the diseased 91.3% were reactors to Tuberculin against 83.07% reactors to BCG.

8.69% of the diseased persons have been negative by Tuberculin test and BCG test.

Analysing the BCG and Tuberculin Positivity and Negativity, from Tables VI and VII, the differences are not statistically significant, the P values being >.2 for 1 T.U. and >.8 for 5 T.U., which eventually signified the better approximation of 5 TU to BCG than 1 TU.

Discussion

In Kenya (Egsmose 1964), the extent to which the vaccination lesion may be used as an indicator of tuberculous infection was examined in several studies. The vaccination induration was more difficult to read than the tuberculin test mainly because of the surrounding oedema being more extensive. Vaccination induration of 10 mm or more revealed 80% of the tuberculin reactors and only 5-8% of the non-reactors proved positive.

Gothi *et al.*, (1974) in their assessment of BCG induration size as an indicator of infection with M. Tuberculosis found that correlation was present between the tuberculin induration and BCG induration on the 5th and 6th days. The percentage of reactors based on tuberculin indurations of size 10 mm or more was close to percentage of persons having vaccination induration of size 14 mm or more on the 5th day, 6th and 8th days. Vaccination induration of 14 mm or more on the fifth or sixth day seems to be the best choice with relative sensitivity and specificity of 84.2% and 88.8% respectively.

Any criteria for demarcating the reactors should not only give a fairly close estimate of infection rates in the community but should also

be effective in identifying infected individuals. In the present study with tuberculin 1 TU PPD RT 23 10 mm and above induration of BCG on the 6th day and with 5 TU PPD RT 23 10 mm and above induration on the 5th day was found to be the indication of infection. The size of the vaccination lesion which gives the highest value of both relative sensitivity and specificity can be considered to be the best level for demarcation of the infected. With the BCG test induration size at 10 mm the relative sensitivity and specificity with 1 TU and 5 TU were 76.6% and 76.9% and 86.2% and 80.6% respectively.

On the basis of tuberculin test, considering 10 mm or more reactions as evidence of infection, 37% in the first study and 38% in the second study were classified as infected. On the basis of reactions of size 14 mm or more at the site of the BCG Vaccination, 38%, in the first and 36% in the second study were found infected. 84% of them were common between the two methods of classification but 11% of tuberculin non-reactors were included as reactors by the vaccination lesion size method.

The proportion of infected in the subjects examined with 1 TU and 5 TU was 43.7% and 56.9% respectively. Proportion within BCG induration size suggestive of infection on 6th day was 45.3% and on the 5th day 57.4%.

The proportion of infected in the subjects examined showing 10 mm or more induration size with 1 TU PPD was 43.7% and with BCG 45.3% and with 5 TU PPD and with BCG was 56.9% and 57.4%.

19% of tuberculin non-reactors with 5 TU on the 6th day and 23% of non-reactors with 1 TU PPD on 6th day showed 10mm and above of BCG induration. Among BCG negatives 18% and 20% were tuberculin reactors on the two groups with 5 TU and 1 TU respectively.

Conclusions

In conclusion, we find that the reactions obtained with BCG, approximate more closely

to those obtained with 5 TU PPD RT23 with Tween 80. In our opinion BCG as a diagnostic tool has no superior value, though it may serve the dual purpose of protecting the uninfected and detecting the infected. Furthermore, it seems to be a harmless test, bereft of any serious complications, as seen from our experience in this study. However BCG is attenuated M.T. Bovis and one cannot be certain of the constituent strength of individual dose, as compared to PPD. In view of the findings of this study, as stated above, the claim that BCG test is superior to the Tuberculin Test is unsustainable.

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ROLE OF PLEURAL BIOPSY BY COPE'S NEEDLE AS A DIAGNOSTIC MEASURE IN PROVISIONALLY DIAGNOSED TUBERCULOUS PLEURAL EFFUSION CASES

O.P. MITAL,* S.K. KATIYAR,** M.C. AGARWAL,*** and S. RAJU

Kelsch and Vaillard (1886) were the first to show the presence of tubercles on the surface of pleura in a case of pleurisy with effusion. May *et al.* (1929) demonstrated tubercles on the parietal pleura by the use of thoracoscope. Proffit Survey (1948) came to the conclusion that majority of the idiopathic effusions were tuberculous in origin. All these cases of idiopathic effusion are treated with antituberculous drugs but a small minority of them may turn out to be non-tuberculous and treating them blindly on anti-tuberculous line is not justified.

Till 1955 pleural biopsy were done either under thoracoscopic vision or by open thoracotomy with or without rib resection. Later, various types of needle and their modifications were used from time to time *e.g.* Vim Silverman needle (De Francis *et al.*, 1955), Abram's needle (Abram's, 1958); Franseen needle (Harvey and Harvey, 1958); Cope's needle (Cope, 1958).

Antituberculous chemotherapy has a definite impact on the histological picture of pleura in tuberculous effusion which indirectly influences the results of pleural biopsy by completely altering the histology. Mishra and Sharma (1959); Agrawal *et al.* (1970) Joshi *et al.* (1961) have attributed their poor results to this fact but they have not substantiated it by data. Only Sohn *et al.* (1961) have studied the influence of chemotherapy on tuberculous pleura.

We undertook this study with the aim to evaluate the role of pleural biopsy (by Cope's needle) in provisionally diagnosed cases of tuberculous pleural effusion and we also tried to study the influence of chemotherapy on the histological findings.

Material and Methods

The cases for the present study were selected from the wards and out-patients of the department of Tuberculosis and Respiratory Diseases, G.S.V.M. Medical College, Kanpur. A detailed clinical history with a special emphasis on previous chemotherapy, and complete physical examina-

tion was done in all the cases. Cases fulfilling the following criteria were included in the study:

1. Straw coloured pleural exudate.
2. Clinical features compatible with tuberculous infection.

Pleural biopsy by Cope's needle was done in each case while doing first pleural aspiration as the initial investigation. The technique adopted was the one described by Cope (1958). Usually two or three bits of pleura were taken out in each case in one sitting through the same puncture from different direction. In no case was biopsy repeated.

Routine investigations, Mantoux test with 1 T.U. of P.P.D. R.T. 23, pleural fluid studies and chest radiography were carried out in all the cases.

Observations

The study comprises of 54 cases including 38 males (70.37%) and 16 females (29.63%). There were 10 indoor and 44 out-door patients and the latter did not require hospitalization for doing biopsy.

Mantoux test showed a positive reaction only in 29 cases (51.9%) out of which 8 cases (14.8%) had a strongly positive reaction (more than 20 x 20 mm). Remaining 26 cases (48.1%) had negative tests (less than 10 x 10 mm).

Pleural fluid examination revealed thin straw coloured fluid in all the 54 cases (100%). Protein and sugar contents ranged from 3 to 4 gm% and 30 to 60 gm% respectively but in majority of the cases it varied between 3 to 4 gm% and 35 to 45 gm% respectively. Lymphocytes were seen predominantly on microscopic examination. Pleural fluid was subjected to culture for tubercle bacilli in 10 cases out of which growth could be observed only in 1 case (10%). This investigation later was given up because of poor results.

*Professor & Head of the Department of T.B. & Chest Diseases, G.S.V.M. Medical College, Kanpur-208 002.

**Lecturer, Department of T.B. & Chest Diseases, G.S.V.M. Medical College, Kanpur-2.

***Lecturer, Department of T.B. & Chest Diseases, G.S.V.M. Medical College, Kanpur-2.

Table 1
Showing tissue positivity

Effusion	No. of cases	Adequate Tissue	
		No.	Percentage
1. Minimal	9	9	100.00
2. Moderate	35	35	100.00
3. Massive	10	10	100.00
Total	54	54	100.00

Table 2

Showing histological findings

Histological findings	No. of Cases	Percentage
Tuberculosis	23	42.59
Malignancy	2	3.70
Chronic non-specific inflammation	23	42.59
Pleural fibrosis	6	11.11
Total	54	100.00

Adequate tissue for histopathology could be obtained in all the 54 cases (100%) irrespective of the size of effusion, whether minimal moderate or massive.

Specific diagnosis on histopathology could be established in 25 cases (46.3%) which included tuberculosis in 23 cases (42.5%) and malignancy in 2 cases (3.7%). Both these cases of malignancy were being treated as cases of tuberculous effusion for over a month. In the remaining 29 cases (53.7%) showing non-specific lesions in whom biopsy could not be conclusive, diagnosis of tuberculosis was established on the basis of indirect circumstantial evidences:

1. Clinical features of tuberculous toxæmia

2. Strongly positive Mantoux test
3. Straw coloured exudate with predominance of lymphocytes and low sugar content.
4. Chest radiograph showing pulmonary lesion compatible with tuberculosis.
5. Response to antituberculous treatment

Thus, in all, diagnosis of tuberculosis could be established in 23 out of 52 cases of tuberculous effusion (44.2%), excluding two cases of malignancy.

Table 3

Showing duration of antituberculous treatment taken

Duration of chemotherapy (days)	No. of cases	Percentage
Nil	5	9.61
1—15	7	13.46
16—30	13	25.00
31—45	6	11.53
46—60	4	7.69
61—75	7	13.46
76—90	5	9.61
91 and above	5	9.61
Total	52	100.00

As is seen in this table, it was observed that biopsy confirmation of tuberculosis could be obtained in 18 out of 25 cases (72%) who had antituberculous chemotherapy for less than one month. Out of 10 cases who had taken treatment from 31 to 60 days, diagnosis could be established in 5 (50%). Biopsy in the remaining 17 cases who had therapy of more than 2 months was totally unrewarding and only nonspecific tissue changes could be seen in them. This clearly shows the impact of antituberculous chemotherapy on the histological biopsy yield in cases of tuberculous effusion.

Complications encountered in the series were all minor and self-limiting.

Table 4

Showing relations/lip of biopsy results and duration of antituberculous treatment

Duration of treatment (days)	No. of cases	Biopsy results		
		Tuberculous	Chronic non-specific inflammation	Pleural fibrosis
Oto30	25	18(72%)	7(28%)	—
31 to 60	10	5(50%)	5(50%)	—
61 and above	17		11(64.7%)	6(35.3%)
Total	52	23(44.2%)	23(44.2%)	6(11.5%)

STUDY OF CAUSAL ALLERGENS IN CASES OF BRONCHIAL ASTHMA AT BHOPAL

U.C. TIWARI*

Introduction

Although it is wellknown that pollens, dusts, fungi, danders and insects are common offending allergens responsible for bronchial asthma but relative frequency of allergy by these different groups of allergens may vary from place to place. Moreover, even in any one group (*e.g.* fungi or pollen or dust) the causal allergen may be different in different places depending on the type of local plantation, allergenicity of different pollens, dusts, insects, fungi, etc. present in the atmosphere and immunological state of the patients living in that atmosphere.

Thus after starting first allergy clinic of Madhya Pradesh at Bhopal, the study was taken up to find out causal allergens of bronchial asthma in patients of Bhopal area by intradermal testing with known allergenic antigens.

I have already presented study of pollen allergy at another conference and the present paper deals with the study of other causal allergens like insects, fungi, and dusts.

Material and Methods

One hundred patients of bronchial asthma with or without allergic rhinitis were included in the present study. 10 healthy volunteers served as controls. Diagnosis of asthma was clinically done on the basis of detailed history (by allergy questionnaire) and other criteria followed by Shivpuri (1974).

Other causes of paroxysmal dyspnoea and rhinitis were excluded by clinical evaluation, blood eosinophils, sputum examination X-ray chest and E.C.G.

Skin Tests

Antigen extracts of 18 insects, 14 fungi and 4 dusts were used for intradermal skin testing. The method of skin testing and criteria for gradation of reaction were same as proposed by Shivpuri (1962, 1969). 2 + or more reactions were taken as significant positive for fungi and dusts but for insects more than 2 + reactions were taken as significant.

Observations and Results

Majority of patients had asthma alone. K.D.

Gupta *et al.*, (1959) also found bronchial asthma in 82.5% cases whereas Agnihotri, *et al.*, (1971) Jha *et al.*, (1975) and Mittal *et al.*, (1978) found combined allergy in majority of cases.

Table 1

Distribution of patients according to clinical manifestations and type of bronchial asthma

Type of allergy	Perennial	Irregular	Seasonal	Total No.	%
Bronchial Asthma	13	14	46	73	73%
B. Asthma + A. Rhinitis	5	12	10	27	27%
Total	18	26	56	100	—

As in Viswanathan (1964), Jha (1975) and Mittal (1978) there was high incidence of seasonal cases.

Table 2

Age and sex distribution of patients studied

Age group	Males	Females	Total
10—19	10	4	14
20—29	13	9	22
30—39	31	15	46
40 and above	9	9	18
Total	63	37	100

Incidence was higher in males than females. This was also found by Jha at Varanasi (1975) Viswanathan (1964) and Mittal *et al.*, at Kanpur (1978).

*Allergy Clinic, Department of Medicine, Gandhi Medical College, Bhopal.

Maximum cases were in the age group of 30-39 years whereas Agnihotri *et al.*, (1971) Wig *et al.*, (1964) found high incidence in younger age.

Table 5
Relationship between positive skin tests by different groups of allergens and type of bronchial asthma

Table 3

Age of onset of bronchial asthma in the patients studied

Age of onset	Males	Females	Total
0— 9 Years	3	2	5
10—19	12	12	24
20—29	29	12	41
30—39	12	8	20
40 & above	7	3	10
Total	63	37	100

As in Mittal *et al.*, (1978) age of onset was between 10-29 years in majority of cases.

Table 4
Family history of allergy

Type of	Total studied	History of		Percentage cases.
		Resp. allergy	Other allergy	
Br. Asthma	73	21	8	39.72%
Br. Asthma -(-Rhinitis)	27	12	3	55.5%
Total	100	33	11	44%

Chaube (1973). Kasliwal *et al.*, (1959), Viswanathan (1964) and Mittal *et al.*, (1978) reported family history of allergy in 41%, 40%, 42.2% and 54.7% cases respectively.

84% patients showed significant positive Skin tests. In the irregular group skin tests were

Antigens	No. of Patients			
	Perennial	Irregular	Seasonal	Total
Insects	5	15	19	39
Fungi	1	1	2	4
Dust	—	—	1	1
Insects + Fungi				
Insects + Dusts	—	2	8	10
Fungi + Dusts	—	—	1	1
Insects + Fungi Dusts	2	1	5	8
Total	14	26	44	84
Total pt. Tested	18	26	56	100
% Positive	77.7%	100%	71%	84%

positive in all cases. Shivpuri *et al.*, (1971) found positive tests in only 25.4% non-seasonal cases.

In Mittal *et al.*, (1978) only 7.7% tests were significant positive, Shivpuri (1971) found that next to pollens, dusts insects and fungi give positive reactions.

Summary & Conclusion

1. One hundred patients (63 males and 37 females) of bronchial asthma attending allergy clinic, Hamidia Hospital, Bhopal were studied clinically as well as with antigen skin tests with 18 insects, 14 fungi and 4 dusts.

2. Majority of the patients were in the age group 30-39 years and age of onset was between 10-29 years.

3. Asthma was associated with rhinitis in 27% cases.

Table 6

Frequency of positive skin tests with different individual antigens

SI. No.	Antigen	+ ve	SI. No.	Antigen	-j-ve	SI. No.	Antigen	+ ve
	Insects			Fungi			Dusts	
1.	C. Beetle	31	1.	Mucor	18	1.	House dusts	7
2.	Jassids	29	2.	Asp. Tamaritii	7	2.	Cotton dusts	7
3.	Butterfly	27	3.	Asp. Fumigatus	6	3.	Wheat dust	3
4.	Locust male	27	4.	Fusarium	6	4.	Paper dusts	Nil
5.	Mosquito	22	5.	Curvularia	5			
6.	Grasshopper	20	6.	Asp. Flavus	3			
7.	Yellow Wasp	19	7.	Rhizopus	3			
8.	Locust M.	18	8.	Cladosporium	2			
9.	Housefly	18	9.	Phoma	2			
10.	Moth	17	10.	Trichoderma	2			
11.	Rice Weevil	16	11.	Candida	2			
12.	Cricket	16	12.	Asp. Versicolor	1			
13.	Honeybee	15	13.	Helminthosporium	1			
14.	Dragonfly	15	14.	Alternaria	1			
15.	Aulacophora	14						
16.	Ants	12						
17.	Cockroach M.	12						
18.	Cockroach F.	10						

Table 7
Results of skin tests with 18 insects, 14 fungi and 4 dusts

Name of antigen (Group)	Total skin tests done	Total positive	Percentage
Insects	1800	338	18.77%
Fungi	1400	49	3.5%
Dusts	400	17	4.25%
Total	3600	504	14%

4. Majority of the patients had seasonal asthma (56%).

5. Family history of allergy was present in 44% cases.

6. Insects alone or along with fungi or dusts were responsible for positive skin tests in majority of the patients (78% cases).

7. The most frequent offending allergens were C. Beetle, Jassids, Butterfly, Locust male in insects group, Mucor and Aspergillus Tamaritii in fungi group and house dust, cotton dust in dust group. Allergy to paper dust was not found,

Table 8

Result of Skin Tests of Frequently Positive Allergens
(Comparison between different Studies)

Sl. No.	Allergens	Percentage						
		Shivpuri 1964	Shivpuri 1968	Shivpuri 1971	Lahiri 1974	Jha 1975	Mittal 1978	Present series
<i>Insects</i>								
1.	C. Beetle	—	—	7.5	—	—	—	31
2.	Jassids	—	—	—	—	—	—	29
3.	Butterfly	—	—	8.1	14	—	—	27
4.	Locust M.	—	—	10.5	—	—	20.40	27
5.	Mosquitoe	—	—	—	—	—	15.00	22
6.	Grasshopper	—	—	—	—	—	—	20
7.	Yellow Wasp	—	—	—	—	—	—	19
<i>Dusts</i>								
1.	House	28	32.6	34.5	—	34.8	11.1	7
2.	Cotton	11	9.5	—	—	19.6	—	7
3.	Wheat	46	23.6	15.9	—	23.2	23.2	3
4.	Paper	5	11.7	—	—	18.8	—	—
<i>Fungi</i>								
1.	Mucor	—	9.9	—	—	—	7.5	8
2.	Asp. Tamaritii	—	8.5	—	—	—	—	7
3.	Asp. Fumigatus	12	—	7.3	20	—	—	6
4.	Fusarium	6.4	—	—	—	—	—	6
5.	Curvularia	—	8.6	—	—	—	—	5

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CAUSATIVE FACTORS IN BRONCHIAL ASTHMA AND SKIN TESTING WITH LOCAL ALLERGENS

HARIHAR DAS*, M.A. RAHIM,** and K.V. RAMANA RAO***

Introduction

Bronchial Asthma is a disease of multifactorial aetiology. Factors like allergy, infection, emotion trigger the attacks singly or in combination. The present study has been undertaken to precisely identify these and assess the value of skin testing with local allergens as a diagnostic aid.

Wig *et al.*, (1960) observed familial predisposition in about 60% cases. Jha *et al.*, (1975) elicited same in 65.2% cases.

Stevenson *et al.*, (1975) showed allergy as causative factor in 45% cases, infection in 48.2% and other factors like emotion, exercise etc. in 6.8%. Singular factor caused attacks in 51%.

Exercise induced asthma was observed in 34% cases, in a study by British Thoracic and Tuberculosis Association (1975).

Parasitic infestation by Ascariasis and Ankylostomiasis has been noted in 19% of Bronchial Asthma patients by Tullis (1970).

Materials and Methods

50 proven cases of Bronchial Asthma attending the Allergy Clinic of our T.B. and Chest Department have been analysed in the present study. Reversibility of airway obstruction was established by performing Lung Function Tests before and after salbutamol inhalation. All the relevant details were noted down on a special proforma. These included past history of respiratory infection, familial predisposition, association of other allergies etc.

Blood D.C. and absolute Eosinophil count were estimated to find Eosinophilia. Similarly sputum/nasal smear were studied for Eosinophils. Stool was examined for parasites. Sputum was cultured to detect causative organism, if any. X-Ray chest was also taken to ensure that there was no organic lesion lying behind which might have caused breathlessness.

For establishing role of allergy, skin test was done with 50 allergens of local importance. Skin

test positivity was further confirmed by doing a P-K test and Bronchial sensitivity test. Grading of all these tests was done as laid down by Shivpuri

Observation

Table 1

Age & Sex Distribution

Age Group (Years)	Male	Female	Total
10—19	4	2	6 (12%)
20—29	12	3	15 (30%)
30—49	16	7	23 (46%)
50—59	3	1	4 (8%)
60 & above	2	0	2 (4%)
Total	37	13	50 (100%)

Male preponderance is clearly seen in the table with maximum patients in 30-49 years age group. No female patient was seen in 60 and above age group.

Table 2

Type of Asthma on basis of Skin Tests

Type of Asthma	Males	Females	Total
Extrinsic	35	10	45
Intrinsic	2	3	5
Total	37	13	50

*Professor and Head of the P.O. Department of T.B. & Chest Diseases, S.C.B. Medical College and Ex-Officio Superintendent, Anti-T.B. Demonstration & Training Centre, Cuttack, Orissa.

**Assistant Professor, Department of T.B. & Chest Diseases, S.C.B. Medical College, Cuttack, Orissa.

***Clinical Tutor (T.B. & Chest), Department of Medicine, M.K.C.G. Medical College, Berhampur, Orissa.

45 patients came out as Extrinsic Asthmatics on basis of skin tests. 60% of Intrinsic Asthma patients were females.

80% had other allergic diseases over and above Bronchial Asthma 66% had Allergic Rhinitis.

Table 3 Family History of Allergy

Type of Asthma	+ ve History	No History	Total
Extrinsic	33 (73%)	12 (26.7%)	45 (100%)
Intrinsic	2 (40%)	3 (60%)	5 (100%)
Total	35	15	50(100%)

73.3% of Extrinsic Asthmatics gave positive family history of Allergy whereas 40% of Intrinsic Asthmatics only gave the same.

Table 6 Distribution of Allergy

Type of Allergy	Extrinsic Asthma	Intrinsic Asthma	Total
Nasal	31	2	33
Urticaria	17	1	18
Eczéma	10	1	11
Food	9	0	9
Drug	3	0	3
No Allergy	7(15.6%)	3(60%)	10(20%)
1 or more Allergy	38 (84.4%)	2(40%)	40(80%)
Total	45(90%)	5(10%)	50(100%)

Table 4

History of Allergy in other Family Members

-)-ve History	+ ve to 1 Allergen	+ ve to any 2 Allergens	+ ve to 3 or more Allergens	Total
In 1 member	3(21.2%)	2(18.2%)	6(55.6%)	11(33.3%)
In 2 members	1(14.3%)	2(28.6%)	4(57.1%)	7(21.2%)
In 3 or more members	1 (6.7%)	5(33.3%)	9(60%)	15(45.5%)
Total	5(15.1%)	9(27.3%)	19(57.6%)	33(10.0%)

From table 4 we see that as number of family members with positive history increased, skin test response to more than one allergen increased. There was a fall in response to single allergen.

It can also be seen that 84.4% of Extrinsic Asthmatics had other allergies. But 40% of Intrinsic Asthmatics only had other allergies. Food or drug allergy was not noted in Intrinsic Group.

Table 5. Association of Other Allergies

Type of Allergy	Alone	In combination	Total
Nasal	14	19	33
Urticaria	3	15	18
Eczéma	2	9	11
Food	0	9	9
Drug	0	2	2

More than one Allergy 21 patients
No Allergy 10 patients

Table 7

Result s of P-K test and Bronchial Sensitivity test CR.S.T.)

Allergen	Total +ve	P—K +ve	B.S.T. +ve
Pollen	52(29%)	42(80.8%)	15(28.9%)
Fungi	39(21.8%)	31(79.5%)	8(20.5%)
Dusts	34(19%)	28(82.4%)	12(35.3%)
Insects	34(19%)	26(76.5%)	10(29.4%)
Feathers and Danders	6(3.4%)	5(83.3%)	0
Miscellaneous	14(7.8%)	12(85.7%)	2(14.3%)
Total	179(100%)	144(80.4%)	47(26.3%)

Table 7 shows that out of total tests positive about 80% were P-K test +ve. But inhalation test did not reveal close corroboration and was positive in about 26% only.

Table 8

Patient-Mise corrélation of above tests

Allergen patients +ve.	Total	P— K+ve	B.S.T. +ve
Pollen	32(71.1%)	28(87.5%)	15(46.9%)
Fungi	26(57.8%)	22(84.6%)	7(26.9%)
Dusts	31(68.9%)	26(83.9%)	12(38.7%)
Insects	25(55.6%)	21 (84%)	9(36%)
Feathers and Danders	6(13.3%)	5(83.3%)	0
Miscellaneous	11 (24.4%)	9(81.1%)	2(18.2%)
Total	45(100%)	42(93.3%)	29(64.4%)

When considérée patient wise corrélation is better among above 3 tests. P-K test was +ve in 93% and inhalation test in 64% cases.

Table 9

Age of onset of Asthma and Skin test positivity

Age Group	-fve to more than 1 allergens.	+ve to more than 3 allergens.
0—9 years	100%	66.6%
10—19 years	93.3%	66.6%
20—39 Years	86.3%	54.5%
40 & above	85.7%	42.8%

In thé above table we see that skin test positivity is more in younger ages. So also response to more than 3 allergens.

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Table 10

Skin test results in 29 person cases (B.S.T. +ve) of Asthma

Allergen	+ ve cases
Pollen only	8 (27.6%)
Fungus only	4(13.8%)
Dust only	3 (10.4%)
Insect only	1 (3-4%)
Insect + dust	5(17.3%)
Pollen + Fungus/Pollen + Insect	2each(6.9%)each.
Pollen + dust	
Fungus + dust	1(3.4%)
Pollen + Insect -f dust	1(3.4%)
Total	29 (100%)

From Table 10 we see that pollen is by far thé most common allergen singularly. In 14 more than one allergen caused attacks, pollen being thé common accompaniment.

Table 11

Type of Asthma	Infection alone	Infection in combination	Total
Extrinsic (Total : 45)	7	8	15(33.3%)
Intrinsic (Total : 5)	2	1	3 (60%)

Infection was responsible for causing attacks in 60% cases of Intrinsic Asthma. In extrinsic Asthma it was responsible in 33,3%.

Table 12
Association of Parasitic Infections

Parasites	Number detected
Hookworm Roundworm	7 13 20(40%)
Strongyloid stercoralis	2
Girdia Lamblia	9
Entamoeba Listolytica	13
Total cases examined	50

Examination of stools revealed the présence of Ascariasis and Ankylostomiasis in 40% cases.

Table 13
Eosinophils in Blood, Sputum and Nasal Smear

Observation	Number of cases
<i>Eosinophil count more than 500 cmm,</i>	18 (36%)
<i>Blood Eosinophiïia + Eosinophils in sputum nasal smear</i>	33 (66%)
<i>Total case examined</i>	50 (100%)

This évident from Table 13 that 36% cases had Eosinophil count more than 500/cmm. 66% had Blood Eosinophiïia with Eosinophils seen in sputum or nasal smear.

Discussion

Majority of patients are in the 20-49 years Group which is the working period. No females were seen in age group of 60 and above, which might be due to hormonal factors.

It is évident from Table 14 that a singular factor caused attacks in 27 cases (54%); in 19(38%) more than one caused attacks. In 4(8%) all above tests failed to identify a cause. Allergy and infection were found to have a significant rôle on the whole,

Table 14
Causative Factors in Asthma

Allergy only	14(28%)
Infection only	9(18%)
Exercise only	2(4%)
Emotion only	2(4%)
Allergy + Infection	2(4%)
Allergy +- Exercise	4(8%)
Allergy + Emotion	2(4%)
Emotion +- Exercise	21(1%)
Infection + Exercise	3(6%)
Allergy + Infection + Emotion	2(4%)
Allergy +- Exercise + Emotion	3(6%)
Allergy + Infection + Exercise + Emotion	2(4%)
No Cause found	4(8%)
Total	50(100%)

On the basis of skin tests 90% patients came under Extrinsic Group. Out of 5 Intrinsic Asthmatics 60% were females. In these patients attacks might have been due to alteration in sex hormones.

Family history of allergy was more elicited in Extrinsic Group. As number of family members affected increased, positivity to multiple allergens also increased. So heredity does play a rôle in causing Asthma.

That Asthma is allergic in origin is corroborated by the observation that 80% have other allergies in addition, nasal allergy being the commonest. This is more pronounced in Extrinsic Group where 84% have more than one allergy. In Intrinsic Group this figure is only 40%.

Positive skin tests were further continued by passive transfer and inhalation tests. When

considered positive P-K tests and patient-wise P-K test had good corroboration. With Inhalation tests good corroboration was seen only when considered patient-wise. These discrepancies may be due to altered state of allergen (Extract) and differing sensitivity of target organs.

Asthma starting in early age has been found to be allergic usually. Positivity to multiple allergens was also more.

Of the allergens responsible pollen was by far commonest followed by fungi. This might be due to the specific botanical characteristics of these aero allergens.

Infection was found to have a role in causing asthma in 60% of Intrinsic Group. It was responsible in 33.3% of Extrinsic Group.

Examination of stools revealed various parasites. 40% had Ascariasis and Ankylostomiasis. These have been attributed by some for causing attacks.

Eosinophilia has detected in 35%. 66 % had some with Eosinophils in sputum/nasal smear. This further testifies the role of allergy.

An overall observation reveal that allergy, infection, exercise and emotion caused attacks singly in 54%. In 38% they caused some in combination. In either group allergy and infection had a significant role. All above investigations failed to reveal a cause in 8%. An unexplained mechanism might be responsible here.

Summary

—50 patients have been analysed for isolating the causative factor for asthmatic attacks and to find out the value of skin testing with local allergens.

—Male preponderance seen over females. No female patients over 60 years age.

—On the basis of skin tests 90% patients came

out as Extrinsic. So skin test is a valuable diagnostic aid.

—Family History of allergy and Association of allergies was more in Extrinsic group.

—Correlation between positive skin test, P-K test and inhalation tests was better when considered patient-wise and not when compared with regard to total +ve tests.

—Younger the age of onset of asthma, more was positivity to multiple allergens.

—Pollen was found to be most common aero allergen followed by fungi.

—Infection had a more dominant role in Intrinsic Asthma.

—Parasitic infection was observed in some cases which might be responsible for the attacks.

—In 54% allergy, infection, exercise and emotion were singly responsible. In 38% they caused attacks in combination. In both, allergy and infection played a significant role. In 8% no cause could be found out.

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Summaries of Papers Presented at Thirty third National Conference on Tuberculosis and Chest Diseases; November, 1978

TREATMENT IN THE 6TH FIVE YEAR PLAN

B.N.M. BARUA

The Central Government is already providing the four standard anti-TB drugs free to all the clinics run by the state governments and voluntary organisations. If adequate funds are available, limited quantities of Rifampicin, Pyrazinamide and Ethambutol may also be provided to these clinics in the 6th plan. The possibility of producing the last named drugs indigenously is also being explored. The Ministry of Finance is being requested to exempt these drugs from customs duty with a view to bring down the cost. The National Development Council appears to be of the opinion that all centrally sponsored schemes (including supply of anti-TB drugs) should be transferred to the state sector. The Central Council of Health, however, has recommended that status quo regarding supply of drug; should be maintained. The final decision is expected soon.

Standard drugs are procured by the Government of India directly through the Directorate-General of Supplies and Disposal and distributed to the clinics through the medical stores depots. The licenced capacity and the letter of intent for various drugs is more than adequate to meet our present requirements *viz.* treatment of about 1.2 million known patients. Steps are being taken for expanding the production to cope with the treatment of about 2 million patients likely to be found when diagnostic activity is stepped up. Case holding is expected to improve through motivation and defaulter action by the multi-purpose and community health workers.

CLINICAL ASPECTS OF TREATMENT

K.V. KRISHNASWAMI

In order to be fully effective, treatment should be properly organised, fully decentralized and offered on a domiciliary basis free to all patients near their residence or place of work. Under programme conditions, the efficiency of treatment usually falls short by 20% to 30%, because of irregularity and drug default by the patients. Initial radiological or bacteriological status and the severity of diseases do not seem to influence the drug collection pattern of the patients. Primary drug resistance does influence the final results appreciably though many patients with drug resistant bacilli do respond favourably even to standard drugs. There is every justification for treating abacillary cases with a view to prevent them from becoming infectious later on. The response to treatment of abacillary patients is better than in the case of bacillary patients.

ORGANISATION OF TREATMENT AND TREATMENT PROBLEMS IN THE NATIONAL TUBERCULOSIS PROGRAMME

N.K. MENON *et. al.*

It is common knowledge that a wide gap exists between the potential efficiency of treatment regimens and the actual results achieved under the national control programme. Only 33% of the patients in Bangalore made 12 or more collection of drugs in 15 months at the DTC and only 29% at the PHIs. 69.2% of the patients were lost to treatment at various levels of duration. Only 5.6% of the patients did not default even once in collecting drugs and 34.7% had four or more defaults during 15 months of treatment. Of all the patients who were lost to treatment, 52% did so at the first default. The main reasons for default were irregular and inadequate supply of drugs, inadequate funds for the use of vehicles for supervision and defaulter action and other operational factors like inadequate training of personnel of the PHIs and lack of supervision. The national programme is technically sound and administratively feasible but there is need for strengthening the organisational structure to make the programme really effective. The role of multi-purpose workers in making the treatment effective and short-treatment chemotherapy in reducing the duration of treatment was emphasised.

FURTHER EXPERIENCE WITH A SIMPLE AGGLUTINATION TEST FOR THE SERO-DIAGNOSIS OF TUBERCULOSIS

D. RAGHUNATH *et. al.*

Agglutination test for the diagnosis of tuberculosis was carried out in 70 tuberculous persons and 40 healthy controls. The test was performed with 110 titrations. Of the 70 tuberculous persons, 35 were sputum positive; 25 were cases of extra pulmonary tuberculosis confirmed histo-pathologically or bacteriologically and the remaining 10 were originally considered to be tuberculous clinically but subsequently in 7 the diagnosis of malignancy was established, in 2 pneumonitis and in 1 bronchiectasis. The test was negative in 14/60 cases of confirmed tuberculosis and in the remaining showed a positive reaction varying from 1 : 30 to 1 : 240. The test was also positive in 21/50 controls and non-tuberculous patients. The highest titre was 1 : 240 in a case of active sputum positive pulmonary tuberculosis. The results do not substantiate the usual claim of sero-diagnosis as the titre 1 : 60 could detect just 50% cases.

ROLE OF CIRCULATING ANTIBODIES IN PULMONARY TUBERCULOSIS

DEEPAK CHOUDHARY

(Paper published in full in this issue)

CORRELATION OF LYMPHOCYTE TRANSFORMATION WITH TUBERCULIN SKIN TEST AND AGGLUTINATION TEST IN TUBERCULOSIS PATIENTS

V.K. PERUMAL *et. al.*

Seventy-five freshly diagnosed sputum positive, Mantoux positive patients of pulmonary tuberculosis (Group I), 16 Mantoux negative healthy individuals (Group II) and 5 BCG vaccinated healthy persons (Group III) were subjected to lymphocyte transformation test (LT) and serum agglutination test besides the Mantoux skin test. The LT index and Mantoux reaction in both groups I and II were found to be positively correlated. The former was always higher than 1.0 in Group I and always below 1.0 in Group II. There was a statistically significant association between high Mantoux reaction and high titre of agglutination in group I. No such conclusion was possible in Group II due to insufficient data. The association between high L.T. index and high titre of agglutination was also significant in Group I. In Group III, the L.T. index became positive earlier (about 3 weeks after vaccination) than tuberculin reaction.

METRONIDAZOLE IN THE MANAGEMENT OF PROFUSE PURULENT EXPECTORATION

R.C. JAIN *et. al.*

20 cases of profuse purulent sputum were given Metronidazole and the 10 controls were given antibiotics. In 75% of the cases on Metronidazole sputum was significantly reduced in quantity and became odourless in 24 hours whereas the results in cases treated with antibiotics were invariably poor and unsatisfactory. Since Metronidazole is inactive against aerobic organisms, it may be inferred that there was a super-added infection with an anaerobic micro-organisms in the cases which improved, even though the presence of anaerobic micro-organisms could not be confirmed bacteriologically.

AIR POLLUTION IN STEEL INDUSTRY (PRELIMINARY REPORT)

V.K. ARORA

Efforts have been made to find the concentration of dust in dust-hazardous areas. Blast furnaces, raw material, material handling plant and sinter plant showed that size of the particles varies from 0.001 to 100 μ g. Refractory material plant and coke oven showed particles between 5 and 1 ng respectively to 100 μ g. No occupational hazard was found in patients working in these dust hazardous areas. VC and FEV₁ of persons residing in Bokaro Steel City for the last 5 years was less as compared to the new recruits.

TUBERCULOSIS — ITS CONTROL PROGRAMME IN BANGLADESH

GULAM NABI

The prevalence of tuberculosis in Bangladesh is about 4%. Nearly 1/10th of the cases are bacteriologically positive. 92% of the population lives in villages and the prevalence in the villages is almost equal to that in the cities. Nearly 45% of the children at the age of 15 are tuberculin positive. The country has 44 TB clinics and 1000 TB beds, all situated in urban areas. Treatment is now being integrated with the general health services in the rural areas and treatment facilities are available in 75 out of the 170 rural health centres. The basis of diagnosis is sputum examination of the symptomatics (persons with cough of 4 weeks' duration) attending the rural health centres. Direct BCG vaccination of children upto 15 years is being carried out. The National Anti-Tuberculosis Association has been entrusted with the responsibility of motivating people in respect of BCG vaccination successfully. There are 12,000 family welfare workers in the country, each such worker being responsible for 6,000 rural population. These para-medical workers are being trained in the technique of BCG vaccination in addition to looking after the work of case-finding and treatment organisation.

COMMUNITY PARTICIPATION IN CONTROL OF TB IN BANGLADESH

The tuberculosis control programme was launched in Bangladesh in 1977. The National Anti-Tuberculosis Association had only district branches upto 1974. It is now concentrating on starting branches at the sub-divisional and thana levels. 20) such branches have already been started. The activities of the Association in respect of involving the community in the national control programme include printing and distribution of brochures on correct knowledge about tuberculosis, publishing a quarterly magazine entitled "Fight TB" and putting up hoardings on important highways and road-side islands. Short 35 mm cinema films with a view to creating awareness amongst community and imparting correct knowledge about tuberculosis have been prepared with assistance from the Canadian Thoracic Association and are being exhibited in all parts of the country. The Association takes active part in industrial, agricultural and cultural fairs especially in the rural areas. Organisations like Boy Scouts, Girl Guides, Jatiya Tarun Sangh etc. are also involved in the community programme. Periodic conferences, seminars, symposia are also arranged. With the help of the Anti-Tuberculosis Association, 91% of the target for BCG vaccination was achieved in 1975.

TUBERCULOSIS OF THE SKIN

BINAYAK RAY and S.K. BHATTACHARYA

Lupus Vulgaris is the commonest type of skin tuberculosis, next being Scrofuloderma and Tuberculosis Verrucosa Cutis (T.V.C.). Males suffer appreciably more than females though in the western countries females are affected two to three times more than males. Most of the cases were in the younger age groups *i.e.* upto 30 years. Lupus Vulgaris was found to affect not only face and neck but almost all parts of the body especially lower extremity and buttocks. Lupus Vulgaris and T.V.C. seem to develop more frequently in persons with good immunological status whereas Scrofuloderma develops in individuals with little immunity.

SHORT-TERM CHEMOTHERAPY OF PULMONARY TUBERCULOSIS A CO-OPERATIVE TRIAL

Research Committee of Tuberculosis Association of India

The paper reports on the 4th interim analysis of data collected during a co-operative drug trial using three drug regimens. Group A patients received INH, Streptomycin, Ethambutol and Pyrazinamide daily for 20 weeks followed by a placebo for 60 weeks. Group B was the same as Group A except that Pyrazinamide was replaced by Rifampicin. Group C patients received conventional treatment *i.e.* INH and Streptomycin daily for 8 weeks followed by INH and Thiacetazone daily for 72 weeks.

Of 225 patients included in the trial, 185 initially drug sensitive patients are included in the main analysis. Of these 98.2% in Group A, 95.0% in Group B and 91.5% in Group C were converted by culture at 20 weeks. By 52 weeks however bacteriological reversion had occurred in 21.6%, 8.5%

and 7.8% of the patients in the 3 groups respectively. Reversion rates at 80 weeks were 30.5% , 16.1% and 8.5% respectively. Results at 132 weeks are not yet available for all patients.

A SHORT-TERM CHEMOTHERAPY TRIAL

New Delhi Tuberculosis Centre

A short-term chemotherapy trial has been in progress at the New Delhi Tuberculosis Centre since November, 1976. The 3 drug regimens under study are :

- A : Rifampicin, Pyrazinamide and INH daily for 8 weeks followed by Pyrazinamide and INH daily for 18 weeks.
- B : Streptomycin, Pyrazinamide and INH daily for 8 weeks followed by Pyrazinamide and INH daily for 18 weeks.
- C : Streptomycin, Thiacetazone and INH daily for 18 weeks followed by Thiacetazone and INH daily for 18 weeks.

The first 8 weeks' treatment in all three groups was given indoors.

In all 48 patients had been inducted into the study at the time of reporting. Of these 34 were initially sensitive to all the drugs which they were prescribed. Only interim results are available at this stage and due to small numbers no conclusions can be drawn.

CLINICAL TRIALS OF THREE MONTHS AND FOUR AND A HALF MONTHS CHEMOTHERAPY IN PULMONARY TUBERCULOSIS

M.L. MEHROTRA *et. al.*

The results of short-course (3 months and 4½ months duration) chemotherapy in 121 patients were presented. Drugs used were Rifampicin, Pyrazinamide, INH and Streptomycin in one group and Ethionamide in addition to the above four in the second group. Sputum conversion was 100% after 8 weeks in both the groups. The default rate was 7% in the 4-drug regimen and 15% in the 5-drug regimen. There were two relapses amongst 28 patients during 6 months followed up in the 3 months treatment group but no relapses in the 4½ months treatment group. During the period 6 to 9 months after stopping of treatment, there were no relapses in either group.

EXPERIENCES OF INTERMITTENT ONCE A WEEK SHORT COURSE RIFAMPICIN REGIMEN

A.G. PATEL

Results of treatment of 107 patients of pulmonary tuberculosis who were given intermittent (once a week) streptomycin, INH and Rifampicin for 13 to 16 weeks and thereafter INH and Ethionamide or INH and PAS intermittently once a week for another 20 weeks were presented. Sputum conversion was 100% in regular patients. Regularity and acceptability of treatment were above 90%. Adverse reactions were 0.6% to Rifampicin, 2.6% to Streptomycin, 3% to PAS and 23% to Ethionamide.

SUCCESS AND FAILURE OF RIFAMPICIN & PYRAZINAMIDE COMBINATION IN THE TREATMENT OF PULMONARY TUBERCULOSIS UNDER PROGRAMME CONDITIONS

N.L. BORDIA

Forty patients of advanced bilateral cavity disease whose previous treatment with standard drugs for a minimum period of one year had failed were treated with Rifampicin and Pyrazinamide daily for 6 months followed by thrice a week for 3 months and then twice a week for the next 3 months. Culture and sensitivity testing was not done. All patients were positive by direct smear and most of them had had treatment for much longer than one year previously. At the end of one year's

treatment with Rifampicin and Pyrazinamide the sputum was converted by direct smear in all; small cavities were closed and the larger cavities persisted though healed. Patients who had far advanced abdominal involvement in addition, did not fare so well. There were no deaths.

CLINICAL TRIALS WITH NEW ANTI-TUBERCULOUS DRUGS

S.K. KHANIJO *et. al.*

32 patients (25 re-treatment cases including one of cervical lymphadenitis with multiple discharging sinuses and 7 of initial treatment) were treated with several combinations of Streptomycin, Ethambutol, INH, Ethionamide and Pyrazinamide. Sputum conversion was achieved in 87.5% in the re-treatment cases and 85.7% in the initial treatment cases. Radiological regression was observed in 79% and 85% respectively. Cavity closure was seen in 8 out of the 12 and 4 out of 5 patients respectively. Jaundice, probably due to Ethionamide was noticed in 4 cases. Neuropathy was seen in 2 cases and giddiness, anorexia and epigastric burning in one case each. In the cervical lymphadenitis case, the glands regressed satisfactorily and the sinuses healed completely.

SMEAR-NEGATIVE PULMONARY TUBERCULOSIS; CONTROLLED TRIAL OF 3-MONTH, 2-MONTH REGIMENS

S. SUBBAMMAL

In a study involving 1072 smear negative patients of pulmonary tuberculosis in Hong Kong (5 sputum specimens were negative), half the patients were given chemotherapy. In the group which was not given chemotherapy, 41% broke down in a period of 12 months and required anti-tuberculous treatment. 34% of these became sputum positive. Streptomycin, INH, Rifampicin and Pyrazinamide daily for 2 to 3 months prevented breakdown of active disease among patients with negative smears and negative cultures initially. This duration of treatment however was inadequate for those patients who initially were direct smear negative but culture positive.

CONTROLLED STUDY OF SPECIFIC TREATMENT ON BACTERIOLOGICAL STATUS OF 'SUSPECT' CASES

K.S. ANEJA

(Paper published in full in this issue)

ROLE OF STEROIDS AS AN ADJUVANT IN CHEMOTHERAPY IN PULMONARY TUBERCULOSIS

RANI BALASUBRAMANIAN

In a short-term chemotherapy drug trial with Rifampicin, INH, Streptomycin, and Pyrazinamide involving 530 patients, 261 were given steroids in addition to chemotherapy and the remaining 269 were without steroids. Steroids were found to have little or no effect on radiological improvement, cavity closure and speed of sputum conversion. Fluid retention and gastro-intestinal upsets were more frequent and arthralgia was less frequent in steroid group. Steroids do not appear to have any role at all in intensive short-term chemotherapy with highly potent drug combinations like Rifampicin, INH, Streptomycin and Pyrazinamide.

ADVERSE REACTIONS TO PYRAZINAMIDE

C.V. RAMAKRISHNAN

692 patients on Pyrazinamide have been reviewed. The drug was administered in a dose of 40 mg/kg daily or 70 mg/kg twice weekly along with other drugs. 156 or 23% of the patients complained of arthralgia. Mean uric acid value in these patients was 2.8 before start of treatment, going up to 7.8 in the second month and came down to 4.3 at the end of treatment. In 536 patients without arthralgia the mean uric acid values were 3.2, 8.3 and 4.5 at the respective time points. Though uric acid levels are elevated at 2 months, there is no association between the estimated levels of uric

acid at said points and the symptom of arthralgia. Rifampicin seems to have a beneficial drug interaction in lessening the incidence of arthralgia due to Pyrazinamide. None of the cases of Jaundice may be attributed to Pyrazinamide alone.

HEPATIC DYSFUNCTION DUE TO RIFAMPICIN IN CASES OF PULMONARY TUBERCULOSIS

JASWANT SINGH *et. al.*

Rifampicin toxicity was studied in 100 patients in age group 18 to 68 years. Liver function tests were carried out before starting Rifampicin and 15 and 30 days after starting the drugs. In 5% of the patients Rifampicin had to be withdrawn due to marked derangement of liver function. The derangement was observed in the first 15 days of treatment in 2/3rd of the patients. Whether INH was given along with Rifampicin or not did not seem to make any difference. The authors conclude that Rifampicin is a relatively safe drug and should not be stopped unless there is a clear evidence of hepatic toxicity and even in these cases it can be re-started when the liver function returns to normal.

CLINICAL, PHARMACOLOGICAL, AND BIOCHEMICAL ASPECTS OF ISONIAZID METABOLISM IN SOUTH INDIAN PATIENTS

G. RAGHUPATI SHARMA

Pharmacological investigations with INH 15 mg/kg revealed that the relatively poor response in rapid inactivators was due to an inadequate coverage and exposure to INH. The use of slow release INH (Matrix INH) in a dose of 40 mg/kg in rapid inactivators yielded coverage and exposure equivalent to that obtained in ordinary INH 15 mg/kg in slow inactivators. The therapeutic response however was not very much better than with ordinary INH. This may possibly be due to antagonistic effect of monoacetylhydrazine, a metabolite of INH. The use of Rifampicin in a weekly dose of 900 mg or more with INH 15 mg/kg was found to produce an excellent response in once-weekly treatment in rapid inactivators. INH inactivation rate was of no prognostic significance in the treatment of tuberculosis with short course regimens. All through the study the regularity in drug taking was very high. It is conceivable that in irregular patients inactivation rate of INH may acquire further importance.

PATTERN OF RESPIRATORY DISEASES IN HARYANA

M.S. PARMAR

Medical College, Rohtak is organising mobile camp hospitals in different parts of Haryana. 4,448 patients with respiratory symptoms were examined in 11 such camps and the pattern of disease was compared with 23,760 symptomatics who attended the chest OPD in the Rohtak Medical College. In the camp hospital patients, chronic bronchitis accounted for 42.6% of all chest diseases; 18% had upper respiratory infections and 17.36% had pulmonary tuberculosis. Majority of the cases were in the age group 31 to 60 years. As regards the Medical College Hospital patients, 35.7% were found suffering from pulmonary tuberculosis, 21.8% upper respiratory infections and only 18.4% were found to have chronic bronchitis.

ABDOMINAL TUBERCULOSIS AS OBSERVED BY A SURGEON

I.P. ELHENCE *et. al.*

(Paper published in full in this issue.)

ABDOMINAL TUBERCULOSIS

PREM MUKERJEE and RAVI RAJOR

(Paper published in full in this issue.)

ATYPICAL MYCOBACTERIA AND PULMONARY DISEASE

C.C. MUKHOPADHYAYA *et. al.*

Out of 43,929 specimens of sputum collected from patients with cough etc. and radiological opacities suggestive of pulmonary tuberculosis and cultured for A.F.B., M. Intracellular was repeatedly isolated from the sputum of 5 patients and was etiologically related to the pulmonary disease. In another 125 arrested cases of pulmonary tuberculosis atypical mycobacteria of different species were casually isolated. Clinical and radiological features of the cases of pulmonary disease caused by M. Intracellular were presented. All the five cases were treated with the usual anti-tuberculous drugs without surgery. Two recovered, one died and the fate of the other two is not known.

PULMONARY TUBERCULOSIS AND LEPROSY

H.C. SINGH *et. al.*

153 patients attending the Urban Leprosy Centre, Bhopal were examined for evidence of pulmonary tuberculosis and 306 patients attending TB clinic and hospitals were studied for evidence of leprosy. 10 leprosy patients (6.5%) had evidence of tuberculosis. Four of these were sputum positive. The leprosy in all of these was of the lepromatous type. Nineteen tuberculous patients (6.2%) had evidence of leprosy and they were all non-lepromatous. This shows that the two diseases are not antagonistic.

TUBERCULOSIS IN CHILDREN (PANEL DISCUSSION)

H.B. DINGLEY (Moderator), N.L. BORDIA, J.L. BHATIA, N.R. BHANDARI,
GARG and N. ROY (Members)

The prevalence of tuberculosis infection is about 2 per cent in the 0-4 years age group and it increases with age being 8 per cent in 5-9 years and about 16 per cent in 10-14 years age group. The exact figures about morbidity and mortality are not available. The consensus was that tuberculosis among children continues to be important both from the individual and the community point of view, since it accounts for nearly 6-7 per cent of the total admissions of children in hospitals.

Diagnosis of tuberculosis in children is even more difficult. History of sickness is vague, family history or history of contact is usually lacking and clinical signs are indefinite. The usual diagnostic criteria *viz.* tuberculin test, X-ray and sputum examination have their limitations. Tuberculin test indicates infection, but provides no definite clue to the presence of active disease. A negative tuberculin test under the age of 3 years is of great value in ruling out tuberculosis. Diagnosis based on radiography alone may not be accurate since tuberculosis may simulate other chest conditions. Sputum examination among children is far more difficult. It is neither easy to collect sputum in children nor to do gastric lavage as a routine measure.

Regarding treatment, emphasis was on oral therapy rather than on injection therapy, which may be advised in acute types of disease including meningitis and miliary tuberculosis. Surgery is indicated for residual bronchiectasis with or without atelectasis and extensively destroyed unilateral disease. For prevention, emphasis should be more on B.C.G. vaccination than on chemoprophylaxis.

EXCLUSIVE TB WORKERS AT A PRIMARY HEALTH CENTRE BLOCK NEEDED OR NOT?

C.K. CHAUBE *et. al.*

Whether an exclusive TB worker is needed or not has been studied in two primary health centre blocks in Agra district. One trained TB health visitor in one block and one trained BCG technician (multi-purpose worker) in another block carried out case-finding by examining the sputum of symptomatics referred to the primary health centre. The achievement was measured in terms of case-finding, treatment and follow up of diagnosed cases, defaulter retrieval and BCG vaccination.

Exclusive trained TB health visitor was found to be more satisfactory in all aspects of the control programme.

COMMUNITY PARTICIPATION IN TUBERCULOSIS PROGRAMME

N. KALA SINGH

The role of community is invaluable in achieving the objectives of national tuberculosis programme. The community's participation should be active rather than passive and should aim at taking the implementation of the programme to the grass-roots level *viz.* from the district to the village level and even farther down to individual families.

ORGANISATION OF COMMUNITY PARTICIPATION IN D.T.P.

H.P. RAMESH

The author's experience in promoting community participation in the NTP in the district of Chikmagalur was described. The objectives of the community participation are to provide monetary assistance to the deserving, to conduct anti-TB shibirs, to promote health education and TB seal sale and to establish health welfare committees at all levels of the district including at the peripheral level. To achieve this objective, the DTO has to approach the district and sub-divisional personnel and pursue the programme with enthusiasm. Voluntary organisations like Rotary's, Lion's etc. are also being involved in the anti-tuberculosis activities and active taluka and panchayat subcommittees have been set up.

AN APPRAISAL OF SOME ALTERNATIVE PROCEDURES FOR THE PREVENTION AND RETRIEVAL OF DRUG DEFAULT IN DOMICILIARY TREATMENT OF PULMONARY TUBERCULOSIS

(New Delhi Tuberculosis Centre)

Three hundred and thirty two freshly diagnosed patients of pulmonary tuberculosis were randomly divided into three groups for purposes of evaluating alternative systems of default management; 106 (Group P) were visited in their homes *before* due date of drug collection, 115 (Group R) were visited only if they defaulted, and 111 (Group C) were not visited at all. At the end of 1 year Group P showed significantly better results (50.0% with regularity over 95%) than Group R (34.7%) and Group C (29.1%) suggesting that home visiting is essential for default management and 'preventive' home visiting ensures a higher degree of regularity.

In a related study, results of recalling patients by letter rather than through home visiting were evaluated. Interim analysis of 40 weeks' results shows that 42.6% of the 68 patients who were reminded of the drug collection before the due date attended with 95% regularity compared to 42.8% of the 56 who were personally visited. Letter writing seems to be as effective as home visiting.

SOME CONCEPTS IN CURRICULUM FORMATION IN JOB-ORIENTED TRAINING

M.A. SEETHA

The curriculum development in 'Job-Oriented' training is more challenging than framing syllabus for any academic course. The time available is short within which necessary knowledge and skill have to be provided to change the attitude and behaviour of the trainees to accept the responsibility and discharge it as expected. It is almost impossible for the academic courses to include the latest research findings into their curriculum, or to prepare students for any particular job responsibility. This has to be done through 'Job-Oriented' and 'In-Service' training. DTP is based on 'Felt-Need' of the community which changes with time. 'Curriculum' formation has to keep in view many factors like the changes in the programme activities and procedures, the experience of the trainees in DTP before they join the course, their educational background and other similar factors. The NTI includes the Operations Research findings into the training curriculum with minimum 'time-lag'. With rapid changes in the health personnel structure, training becomes a challenge.

CAUSATIVE FACTORS IN BRONCHIAL ASTHMA AND SKIN TESTING WITH LOCAL ALLERGENS

HARIHAR DAS *et. al.*

(Paper published in full in this issue).

STUDY OF CAUSAL ALLERGENS IN CASES OF BRONCHIAL ASTHMA AT BHOPAL

U.C. TLWARI

(Paper published in full in this issue).

ASTHMA AND TUBERCULOSIS

K.V. KRISHNASWAMI *et. al.*

849 cases of pulmonary tuberculosis attending the tuberculosis institute and 293 cases of bronchial asthma attending a general hospital were studied. The investigations included skin tests for bronchial asthma, pulmonary function tests and routine radiological, bacteriological and clinical examinations. 7.2% of the tuberculous patients had evidence of bronchial asthma. The highest proportion of 13.7% was in the age group over 45 years. The prevalence was significantly higher in men than in women. 6.1% of the asthmatics were found to be suffering from pulmonary tuberculosis. Highest proportion of 12.2% was again in the age group over 45 years. The prevalence was more amongst men than women but the difference was not statistically significant. 45% of the patients with asthma and tuberculosis were smokers. The peak expiratory flow means among tuberculous patients having asthma and asthmatics having tuberculosis were 198.03 and 201.54 respectively with standard deviations 66.78 and 72.04 respectively. 11.5% of tuberculous patients among asthmatics gave a negative allergen test. The corresponding figure for asthmatics amongst tuberculous patients was

A COMPARATIVE STUDY OF SALBUTAMOL "ASTHALIN" AND COMBINED TABLET "ASMAPAX DEPOT" IN CASES OF BRONCHIAL ASTHMA

JASWANT SINGH

103 patients of chronic asthma, 84 males and 29 females, were included in the study. The duration of asthma was 2 to 20 years with a mean of 4¹ years. All patients had evidence of broncho-spasm. Every patient was given Asthalin for 7 days, then placebo for 7 days and finally Asmapax Depot for 7 days. "Asthalin" (Salbutamol) was given in doses of 4 mg three times a day. FEV₁ was recorded for every patient at the beginning of the trial (the patient being off all broncho-dilators during the preceding 24 hours), at the end of treatment with Asthalin, at the end of placebo administration and finally at the end of "Asmapax Depot" administration. Side effects were minimal. Asthalin proved to be more effective than Asmapax Depot. 1

HEALTH BENEFIT FROM BCG VACCINATION

V. SLVARAMAN *et.al*

BCG vaccination given to previously uninfected individuals is expected to prevent the development of disease and indirectly by breaking the chain of transmission. Four cohorts of non-infected children 0, 5, 10 and 15 years old were studied. Analysis showed that under the prevailing epidemiological conditions BCG vaccination of 1,00,000 non-infected children will enable the prevention of 627 cases in the new born cohorts, 880 in the 5 year cohort, 1434 in the 10 year cohort and 3639 in the 15 year cohort. The indirect effect has been measured in terms of reduction in the incidence of disease. The BCG programme can bring down the 5 year incidence to 0.69 which is only slightly

higher than 0.57, which would be the result of a case-finding and treatment programme. BCG vaccination is beneficial in terms of cost if the protective efficacy of BCG is more than 28%.

BCG AS A DIAGNOSTIC TOOL

K.V. KRISHNASWAMI

(Paper published in full in this issue.)

ROLE OF PLEURAL BIOPSY BY COPE'S NEEDLE AS A DIAGNOSTIC MEASURE IN PROVISIONALLY DIAGNOSED TUBERCULOUS PLEURAL EFFUSION CASES

O.P. MITAL *et. al.*

(Paper published in full in this issue)

**CITATION READ ON THE OCCASION OF THE PRESENTATION
OF THE TAI GOLD MEDAL TO DR. S.P. PAMRA, DIRECTOR
NEW DELHI TUBERCULOSIS CENTRE, NEW DELHI**

Born in May, 1911 at Phagwara (Punjab) Dr. S.P. Pamra had his early education in Kapurthala. Later, he joined the King Edward Medical College, Lahore and passed his M.B.B.S. Examination from the Punjab University in 1933 with distinction in Pathology. He took his TDD from the Madras Medical College in 1946. After a short stint of private practice in general medicine, he opted for TB work and served as Medical Officer in the Silver Jubilee TB Hospital, Delhi, K.E. Sanatorium, Dharampur and TB Clinic, Simla. He joined the New Delhi TB Centre in 1948. He was awarded the WHO Fellowship for nine months for studying the TB Control Programme in the U.K. and other European countries in 1953. He was appointed as the Director of the New Delhi TB Centre in 1966 and continues to hold this post today.



Dr. Pamra has been a member of the Standing Technical Committee of the Tuberculosis Association of India since 1965- He was Chairman of this Committee and President of the 28th National Conference on TB & Chest Diseases in 1974. He is Associate Editor of the Indian Journal of Tuberculosis published by the Tuberculosis Association of India, and has contributed to various National and International Journals and presented at the National and International Conferences nearly 100 papers on various aspects of TB, particularly domiciliary treatment, epidemiology and control of Tuberculosis. He has served on various expert groups/committees of the ICMR pertaining to Tuberculosis. He was selected by the Andhra Pradesh TB Association for the first P.V. Benjamin Oration in 1973 and the Tuberculosis Association of India selected him for the 'Wander-TAI Oration' in 1975. He was elected Fellow of the National Academy of Medical Sciences in 1975.

Dr. Pamra has wide teaching experience and has been a teacher in TB for under-graduates of the Maulana Azad Medical College since its inception, M.D. (General Medicine) of Delhi University, D.T.C.D. students of Delhi University and M.D. (TB and Respiratory Diseases) of Delhi University and Examiner for M.D. (TB and Respiratory Diseases) and D.T.C.D. courses of several Universities. He is the author of a Text-Book on Tuberculosis for Nurses and Health Visitors and has contributed several chapters in text-books and reference books for specialists, general practitioners and medical students.

In recognition of the meritorious services he has rendered in the field of Tuberculosis, the Tuberculosis Association of India has great pleasure in presenting him with its Gold Medal.

NEWS & NOTES

ANNUAL MEETINGS

The 40th Annual General Meeting of the Association will be held on Friday, the 20th April, 1979, in the Conference Hall of the Association, 3, Red Cross Road, New Delhi. It will be followed by a meeting of the Central Committee of the Association on the same day.

A meeting of the Technical Committee of the Association will be held on Thursday, the 19th April, 1979. The Conference of Secretaries of State TB Associations will be held in the afternoon on 20th April, 1979.

CHAIRMAN OF THE TECHNICAL COMMITTEE

Dr. M.L. Mehrotra, Director-Professor, TB Demonstration and Training Centre and Chest Institute, Agra, has been nominated as Chairman of the Standing Technical Committee of the Association for 1979-80 *Vice* Dr. J.L. Bhatia whose term of office expired with the National Conference held in Bhopal in November 1978. Dr. Mehrotra will also preside over the 34th National Conference on Tuberculosis and Chest Diseases to be held in Jaipur from the 28th to 31st October, 1979.

KHUSHI RAM SHIELD

The Association has decided to award the Rai Saheb Khushi Ram Shield for 1978 to Andhra Pradesh TB Association for their best performance during the year. The Association has also decided to award Certificate of Merit for good performances to the Tamil Nadu TB Association.

SEAL SALE AWARDS

The Association has decided to award the TB Seal Shield for highest collections in the 28th Campaign to the Tamil Nadu TB Association and the Runner-up-Cup to the Kerala TB Association. The Cup for the best performance made by the smaller States and Union Territories will be awarded to Goa, Daman & Diu TB Association. Certificate of Merit for improving the collections will be awarded to Tripura TB Association.

NATIONAL CONFERENCE—JAIPUR

The 34th National Conference on Tuberculosis and Chest Diseases will be held in Jaipur (Rajasthan) from the 28th to 31st October,

1979. Subjects selected by the Programme Committee for discussion at the Conference include: (1) Allergy, (2) Prevalence and incidence of TB and Chest Diseases in Industries *e.g.* mica, copper, coal, mining, etc., (3) Organisational and Administrative problems in the implementation of the National Control Programme, (4) Panel discussion on Chemotherapy, (5) Role of General Practitioners in the control of tuberculosis, (6) Smoking and its effects, (7) Chronic obstructive pulmonary disease, (8) Session for para-medical personnel and (9) Immunology. Those who wish to attend the Conference and present papers may kindly write to the Secretary-General, Tuberculosis Association of India, 3, Red Cross Road, New Delhi-1, immediately together with an abstract of the paper.

ESSAY COMPETITION

The Tuberculosis Association of India will award a cash prize of Rs. 300 to a final year medical student in India for an original essay on Tuberculosis, adjudged best by a special committee of this Association. The subject selected for the 1979 competition is 'Pleural Effusions'. The essay should be written in English, typed in foolscap size, double-spaced and should not exceed 15 pages (approximately 3,000 words excluding tables, diagrams, etc.). Four copies of the manuscript should reach the Secretary-General, Tuberculosis Association of India, 3, Red Cross Road, New Delhi-110 001, not later than 31st August, 1979, and should be forwarded through the Dean or Principal of College/University.

CHANCHAL SINGH MEMORIAL WARD—1979

The Tuberculosis Association of India will award a cash prize of Rs. 500/- to a TB worker, preferably below 45 years of age, for an original article not exceeding 30 double-spaced foolscap typed pages (approximately 6,000 words, excluding charts and diagrams) on a subject relating to Tuberculosis. Papers may be sent, in quadruplicate, to reach the Secretary-General, Tuberculosis Association of India, 3, Red Cross Road., New Delhi-1, latest by 31st August, 1979.

HEALTH VISITORS' COURSE

The 1979-80 TB Health Visitors' Course will commence in July 1979. The course will be of nine months' duration, of which five months will be spent in the New Delhi TB Centre, (including

two weeks in a rural centre in Pataudi, Dist. Gurgaon). The minimum qualification for admission to this course is Higher Secondary/Pre-University with Science or Hygiene and Physiology in matriculation. Application forms for admission to this course can be had from the Secretary-General, Tuberculosis Association of India, 3, Red Cross Road, New Delhi-1. The last date for receipt of applications is 30th April, 1979.

WANDER-T.A.I. ORATION

Dr. H.B. Dingley, Medical Superintendent, Lala Ram Sarup TB Hospital, New Delhi, has been selected for the Wander-TAI Oration—1978. Dr. Dingley has chosen the subject Tuberculosis in infants and children for his Oration which will be delivered at the 34th National Conference on Tuberculosis and Chest Diseases to be held in Jaipur from the 28th to 31st October, 1979.

SRI LANKA CONFERENCE

The XIth Eastern Regional Tuberculosis Conference of the International Union Against Tuberculosis will be held in Colombo (Sri Lanka) from the 14th to 19th October, 1979, under the joint auspices of the Ceylon National Association for the Prevention of Tuberculosis, the Ministry of Health, Sri Lanka and the Eastern Region of the International Union Against Tuberculosis. The Registration fee is US \$5.00 per participant. The main subjects selected for discussion at the Conference are (1) Review of epidemiological situation in the countries of the Region, (2) Treatment and Chemotherapy, (3) Evaluation of BCG Programmes, (4) Bacteriology, (5) Modern methods of case-finding, (6) Community participation in TB Control, (7) Role of voluntary bodies including fund raising and (8) Tuberculosis in children. There will be 14 sessions of 1½ hours duration with one day devoted for field trip to enable participants to visit health institutions close to Colombo. Papers are invited from intending participants in the Region on subjects relevant to the conference topics listed above. Each paper will be of 15 minutes duration. Those desirous of presenting papers in these sessions are requested to send brief abstracts of their presentation to the Chairman of the Conference, CNAPT Centre, 51, Sir Marcus Fernando Marwate, Colombo-7, (Sri Lanka) under intimation to the Secretary-General, Tuberculosis Association of India, 3, Red Cross Road, New Delhi-1, before 31st of May, 1979.

SCIENTIFIC COMMITTEES OF THE IUAT

The International Union Against Tubercu-

losis, Paris, has nominated Dr. S.P. Pamra, Director, New Delhi TB Centre, New Delhi and Dr. B.N.M. Barua, Adviser-in-Tuberculosis, Government of India, as Corresponding Members of its Scientific Committees on Treatment and Prophylaxis respectively for a period of three years commencing from 1979. It may be mentioned in this connection that Dr. S.P. Tripathy, Director, TB Chemotherapy Centre, Madras, is an Ordinary Member of the Union's Scientific Committee on Bacteriology and Immunology while Dr. M.L. Mehrotra, Director-Professor, TB Demonstration & Training Centre and Chest Institute, Agra, is a Corresponding Member of the Committee on Respiratory Diseases.

HONOUR TO DR. M.D. DESHMUKH

The Government of Maharashtra has appointed Dr. M.D. Deshmukh, Honorary Secretary, Maharashtra State Anti-Tuberculosis Association, Bombay, as Professor Emeritus in Tuberculosis for life at the J.J. Hospital and Grant Medical College.

CONFERENCES

The XVIIth Maharashtra State Conference on Tuberculosis and Chest Diseases was held in Bombay from the 23rd to 25th March, 1979, at Dr. Bhalerao Natya Griha, Bombay. The Conference was inaugurated by the Hon'ble Dr. (Smt.) Pramilatai Tople and the Scientific Sessions by Dr. C.K. Deshpande. It was presided over by Dr. (Mrs.) S. Mirchandani. Dr. G.D. Gothi delivered the Dr. B.B. Yodh Memorial Oration. The Scientific Sessions included two Panel discussions, on "Difficulties in the implementation of TB Control Programme", and "Tumours of the Lung" and three symposia on "Childhood Tuberculosis", "Tuberculosis and Family Planning" and "Respiratory Emergencies in General Practice". Some of the important subjects discussed are "Surgical Management of Emphysema", "Ocular Toxicity of Ethambutol", "Effects of Rifampicin on Chronic Tuberculous cases", "Incidence of TB in BCG Vaccinated and non-vaccinated groups", "Pyloroduodenal Tuberculosis", "Short Course Chemotherapy", "Some Aspects of Childhood TB", "Air-way obstruction in Pulmonary TB and its impact on the prognosis", etc. Shri P.N. Raman, Secretary-General, Tuberculosis Association of India, addressed the Inaugural Session. There were two Guest Lectures, one by Dr. A.G. Patel and the other by Dr. S.P. Tripathy.

The VIIIth Karnataka State TB & Chest Diseases Workers Conference was held in

Shimoga on the 20th and 21st January, 1979. Dr. Kul Bhushan, Research Officer, N.T.I., Bangalore, presided over the Conference which was inaugurated by Shri K.H. Srinivas, Minister for State for Youth and Information. Shri Margada Mallappa, Minister for Health, delivered the Validictory Address. Shri P.N. Raman, Secretary-General, Tuberculosis Association of India and Dr. S.P. Pamra, Director, New Delhi TB Centre, attended the Conference and participated in the discussions. A Souvenir was brought out on this occasion.

The 7th Gujarat State TB Workers Conference was held at Baroda on the 21st January, 1979. The Conference was inaugurated by the Chief Minister of Gujarat, Hon'ble Shri Babubhai Jeshbhai Patel.

SHIBIR

The Maharashtra State Anti-TB Association in cooperation with the Lions Club of Mahad and Kurla organised an Anti-TB Shibir at Mahad in District Kolaba on 6th and 7th January, 1979. A team of doctors and para-medical personnel led by Dr. M.D. Deshmukh, participated in the Shibir. A total of 645 persons were registered, 246 were examined, 132 screened, 37 were x-ray positive, 12 sputum positive and 3,290 were given BCG vaccination.

ANTI-TB DAY PROGRAMMES

The Tuberculosis Association of India and State TB Associations observed the 23rd February, 1979, the Foundation Day of the Association, as Anti-Tuberculosis Day. In conformity with the International Year of the Child, the slogan selected was 'Protect the Child Against Tuberculosis' as the theme for the Anti-TB Day this year. The highlight of the programme was a largely attended meeting held in the Conference Hall of the Association on 23rd February with Shri S. Ranganathan, I.C.S. (Retd.), M.P., President of the Association in the Chair and the Hon'ble Shri Rabi Ray, Minister for Health and Family Welfare as the Chief Guest. Dr. B. Sankaran, Chairman of the Association, welcomed the Chief Guest and other invitees. Dr. M.S. Chaddha, Vice-Chairman of the Association, Prof. R. Viswanathan, Emeritus Scientist, V.P. Chest Institute and Dr. S.P. Pamra, Director, New Delhi TB Centre, addressed the meeting. In his inspiring address, Shri Rabi Ray emphasised the need for intensifying the case-finding and treatment programmes in rural areas and regretted that artificial scarcity was being created in regard to potent Anti-TB drugs by firms which did not produce to the full extent of their capacity. He assured the Association that its

suggestion to have a Second National Sample Survey to find out the present epidemiological status of tuberculosis in the country will receive due consideration of the Government. Dr. H.B. Dingley, Medical Superintendent of the Lala Ram Sarup TB Hospital, Mehrauli proposed a vote of thanks.

The period from 17th to 23rd February was observed as Anti-TB Week throughout the country. During this period an intensive health education programme with emphasis on protection of the children against tuberculosis was carried out through newspaper advertisements, publication of special articles and write-ups in leading newspapers like the *Hindu*, *Hindustan Times*, *Indian Express*, *Statesman*, *Times of India*, *the Tribune* and other vernacular papers and also by having group discussions, both in English and Hindi, over the various Stations, of All India Radio and T.V. The *Hindu*, Madras, and the *Tribune*, Chandigarh also gave Editorial support pleading for a realistic approach to tackle the TB problem in the country and for adequate supply of drugs and intensification of the health education programme. Brief details of the functions organised in connection with the observance of the Anti-TB Day in some of the States are given below:

Andhra Pradesh

The State and District TB Associations observed an Anti-TB Week from 17th to 23rd February, 1979. The All India Radio broadcast a talk by Shri A. Madan Mohan, Minister for Medical and Health, a group discussion by Drs. S. Brahmananda Rao, C. Srinivasa Rao and D. Narasimha Rao and an interview in Urdu with Dr. D. Umapathy Rao. Articles on TB in Children were published in the local papers and a larger number of pamphlets, leaflets, etc. were distributed. The Association also organised in collaboration with the Lions Club a TB Camp at Keesaragutta which was inaugurated by Shri A. Madan Mohan, Minister for Medical and Health, Andhra Pradesh. A seminar on TB was organised by the District TB Association of Adilad, a BCG vaccination programme was gone through in all the primary schools of Ongole Town and a Shibir was conducted in Chinakurthi Village. At Machilipatnam (Krishna Dist.) and Arogyavaram (Chittoor Dist.) special lectures and health education programmes, including film shows, projection of slides on TB, etc. were arranged.

Bihar

In Bihar, the Minister for Health and Family Welfare, Shri Jabir Hussain, issued an appeal to

all District Associations to observe the Anti-TB Day and to celebrate the inaugural function of the 29th Seal Campaign. The Minister also gave a broadcast talk over the Patna Station of the All India Radio. The Joint General Secretary of the Association broadcast a talk on 'Recent Advances in the Treatment of TB' and an intensive health education Campaign was conducted through the help of local papers.

Delhi

In Delhi the Anti-TB Day was observed by displaying cinema slides in various cinema halls, putting up cloth-banners carrying anti-TB slogans, arranging for radio talks, films shows, etc. in the city and resettlement colonies and distributing health education material.

Goa

In Goa, the Day was observed by publishing articles in the newspapers, distribution of pamphlets, leaflets and posters in local languages. The Association also arranged for BCG Scar Surveys, Essay Competitions, TB Detection Camps, Lectures, etc. in the various Talukas.

Karnataka

In Karnataka the Kodagu District Association conducted two BCG Vaccination Camps during the Anti-TB Week from the 17th to 23rd February, 1979. In all 485 children were BCG vaccinated. A Health Education programme was organised for teachers and students of High Schools and Higher Primary Schools of Madapur and Kodagarahalli. Pamphlets on TB were distributed, Demonstrations and Lectures were organised, articles on Tuberculosis were published in the local newspapers and film shows were arranged in Kodagarahalli. Reports from other districts are awaited.

Kerala

In Kerala the State Association contributed Rs. 500/- each to all District Associations to enable them to organise the anti-TB week. Public meetings, essay competitions, seminars, classes for school teachers and college students on tuberculosis were arranged. Banners, posters and cinema slides were exhibited in public places and cinema houses and BCG vaccination drive was intensified. Special sale of TB Seals was organised. Local newspapers carried articles and editorials and All India Radio gave good coverage to the various programmes.

Madhya Pradesh

In Madhya Pradesh an intensive health

education programme was organised during the Anti-TB week, both in the Capital and in the Districts. A Press Conference was arranged at Bhopal and Indore which was addressed by Dr. N.L. Bordia. Dr. G.P. Saxena, Dist. TB Officer, Bhopal, gave a broadcast talk over the Bhopal Station of the A.I.R. Articles on TB were published in the local newspapers. TB Associations of Betul, Ujjain, Raipur, Jhabua, Sehore, Rewa, Guna, Indore and Bhopal showed anti-TB slides in Cinema houses, arranged film shows and distributed pamphlets and leaflets, displayed posters, banners, etc. in public places, published advertisements in the local newspapers, and arranged meetings with teachers, parents and students. They also organised BCG Vaccination programmes and meetings.

Maharashtra

The Maharashtra Association held a largely attended Press Conference and articles and write-ups by Dr. C.K. Deshpande, Acting Director of the Municipal Directorate of Bombay City TB Services, Dr. A.P. Rao, Medical Superintendent, G.T.B. Hospitals, and Dr. M.D. Deshmukh were published in the newspapers. The AIR, Bombay, broadcast a panel discussion on TB in Marathi with Dr. M.D. Deshmukh as Moderator and Drs. M.M. Wagle, V.B. Athavale and Y.K. Amdekar as members. The Association organised an Anti-TB Shibir in Kherwadi Project and another at Ghas about 60 miles from Bombay during the Anti-TB Week. Nearly 400 children were examined. 350 were given BCG and symptomatic children were screened.

Rajasthan

The State TB Association and the Rajasthan Branch of the Indian Red Cross Society, jointly organised the Anti-TB Day on 23rd February at Ravindra Ranga Manch, Jaipur. Shri Surya Narain Choudhary, Industries Minister, Rajasthan, was the Chief Guest and Shri Girdhari Lai Bhargava, Chairman, City Improvement Trust, Jaipur, presided over the function. The meeting was addressed by Dr. Gian Prakash, Additional Director, Rural Health Services, Rajasthan, Dr. T.N. Sharma, Professor, S.M.S. Medical College, Jaipur, Dr. P.D. Sharma, Principal, Ayurvedic College, Dr. R.P. Mathur, Rajasthan Homeopathic Medical College, Jaipur and Dr. P.N. Sharma, Superintendent, TB Demonstration Centre, Ajmer.

Tamil Nadu

In Tamil Nadu, Dr. K.V. Krishnaswami, Director, Chest Institute, Madras, arranged on 20th February, a Comprehensive Health Care and

Lung Screening Programme for the Prisoners and staff of the Central Jail. The Programme was inaugurated by Hon'ble Thiru K. Narayana Swami, Minister for Law, Government of Tamil Nadu. The Madras City Association organised a public meeting at the Nehru Stadium on 20th February. The Health Officer, Corporation of Madras, the Hon'ble Thiru R. Soundararajan, Minister for Health, the Governor, Corporation of Madras, Dr. H.V. Hande, M.P., Dr. K.V. Krishnaswami, Director, Government TB Institute, and Dr. Narmada, Deputy Director, Institute of Child Health and Hospital for Children spoke about the various aspects of Tuberculosis and the responsibility of the society in helping the endeavours of Government to control the disease.

The Tamil Nadu Association arranged a meeting at the Queen Mary's College, Madras, which was attended by the students and staff of the College. The meeting was addressed by leading TB Specialists and public men including Thiru K. Swaminathan, Deputy Chairman, Legislative Council. Prizes were distributed to the school children who had participated in the Essay Competitions in English and Tamil. During the Anti-TB Week from 17th to 23rd February, meetings, film shows, etc. were arranged by the district TB Associations in Dharmapuri, Thiruchirapalli, Vellore, Coimbatore, Nilgiris, Thanjavur, Pudukkottai, Madurai, Cuddalore and Kanyakumari. The Tamil Nadu Association produced a special brochure on the occasion and carried out an intensive publicity programme through newspapers, radio, T.V., etc. throughout the State.

Uttar Pradesh

The Uttar Pradesh TB Association organised a meeting in Lucknow, with Shri C.B. Gupta, President of the Association 'in the Chair and Dr. C.N. Pande, Ex-Vice-Chancellor, Roorkee University as the Chief Guest. The meeting was addressed by Dr. M.M.S. Siddhu, M.P., Honorary Secretary, Uttar Pradesh TB Association, Dr. S.N. Gupta, Special Secretary, Medical, Health and Family Welfare Department, Uttar Pradesh, Dr. P.K. Mishra, Chest Specialist, K.G. Medical College, Lucknow, and Dr. M.C. Verma, Senior Health Education Officer, Uttar Pradesh. In Agra the District Association and the TB Training & Demonstration Centre arranged for special publicity programmes through newspapers, group discussions, etc.

Andaman & Nicobar Islands

During the Anti-TB Week from 17th to 23rd February an intensive campaign was conducted to sell TB Seals. A newspaper publicity programme was organised highlighting the importance of early diagnosis, regular treatment for optimum period and preventive aspects of BCG. A BCG vaccination drive was undertaken among the eligible outdoor patients, school children, etc. and a symposium and film shows were also arranged. The All India Radio, Port Blair, gave a good coverage to the various programmes and also broadcast talks by Dr. N.C. Palchoudhury, DMHS, Dr. H.N. Sanyal, TB Officer and Dr. Shafique Quadir, Incharge Modified TB Centre, Port Blair.