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The

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HOME VISITING IN DOMICILIARY TREATMENT

The first tuberculosis dispensary was started by Sir Robert Philip in Edinburgh in 1887. The main functions of this dispensary were surveillance of patients after their discharge from the sanatoria and surveillance of their household contacts during the patients' stay and after their discharge from the sanatorium. This surveillance was carried out through public health nurses.

When domiciliary treatment (or 'Organised Home Treatment' as it was then called) was introduced in our country in New Delhi TB Centre for the first time, treatment of patients was also included in the main functions of a tuberculosis clinic. Counterparts of the public health nurses were designated as 'Health Visitors'. Though they were less comprehensively trained (and were therefore cheaper) than public health nurses, they met our requirements very well. Their main functions then were to teach preventive measures, e.g., cough hygiene, proper collection and disposal of sputum, isolation, etc. to the patients and the family; to supervise their implementation; surveillance of household contacts and finally to act as a link between the patients on domiciliary treatment and the clinic. They thus constituted an essential category of staff and did yeoman's work in the control of tuberculosis at that time. When the results of domiciliary treatment in New Delhi TB Centre were found to be very satisfactory, clinics were started in large numbers in urban areas and health visitors at the rate of approximately one per 50,000 to 100,000 population, depending on available resources and density of population in the area served by a clinic, were provided for home visiting.

With the advent of chemotherapy, the whole profile of tuberculosis changed. The symptoms disappeared quickly and in a few weeks the patients became ambulatory and non-infectious. The emphasis on preventive work in the homes became relatively unimportant. Consequently there was complete reorientation of the functions of the health visitors. Top priority is now given

detected and retrieval action taken promptly.

When the national tuberculosis control programme was introduced in 1962, peripheral health institutions were made responsible for treatment of the patients in the rural area. A change in the pattern of retrieval of drug default became essential since it was impossible to provide the requisite number of health visitors in all the rural areas. One or two health visitors in the district tuberculosis centre are designated as treatment organisers and their job is to brief the para-medical staff in the peripheral health institutions in the method

of maintaining record of treatment and drug distribution etc. It is also provided that the defaulters should be contacted through letters with a view to retrieval where visit through para-medical staff like multipurpose health workers is not possible.

With a view to cope with the expanding facilities and increasing cost of home visiting, some of the institutions e.g. New Delhi TB Centre have lately started inducting less trained individuals as home visiting aides. This category of cheaper staff has also proved to be very useful in retrieval of drug default.

Lastly, the value of home visiting has so far been taken for granted without corroboration from a scientifically controlled study, because the results of treatment are usually much better in institutions where adequate, efficient and systematic home visiting is provided. Yet it is possible that there may be no 'cause and effect' relationship between home visiting and success of treatment or even if such a relationship is present it is possible that some other factors may also be operating simultaneously. Lately three studies have been reported which tend to show that reappraisal of home visiting is now essential. Garai and Sen* have reported that in a rural area the extent and pattern of irregularity did not differ appreciably if no home visiting was provided but retrieval was more effective with uni-purpose than multi-purpose home visitors. New Delhi TB Centre** on the other hand has reported that irregularity was substantially more in a random group of patients to whom home visiting was not made available in a controlled trial. The third study by Krishnacharya and Nagaraja Rao* has shown that the retrieval of defaulters was more effective through home visiting than by letter writing but the advantage was temporary and the patients retrieved by health visitors very soon became defaulters again. All these studies are limited in scope and none of these provide a complete answer for all situations.

It is, therefore, high time that the Technical and Research Committees of the Tuberculosis Association of India take up this question and arrange a controlled scientific study on this important subject. A number of well run and adequately staffed district tuberculosis centres in all parts of the country, in addition to the training and demonstration centres working in metropolitan cities should study this problem according to a common protocol under central co-ordination. Since the financial involvement is likely to be negligible, there is no reason why a large number of district centres should not be able to participate in this study. It is only through such a comprehensive co-operative study that rational and scientifically acceptable information can be had on true contribution of home visiting in preventing and retrieving drug default and the relative efficiency of less trained staff and letter writing vis-a-vis traditional home visiting in this respect both in urban and rural areas.

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* For summaries of these studies, see *Ind. J. Tuberc,;* 1976, 23,74
** Paper published elsewhere in this issue.

AN APPRAISAL OF DIFFERENT PROCEDURES OF HOME VISITING FOR REDUCING DRUG DEFAULT—AN INTERIM REPORT*

GOVIND PRASAD, P. SAXENA, G.P. MATHUR AND S.P. PAMRA
(From New Delhi Tuberculosis Centre)

When domiciliary treatment of pulmonary tuberculosis wa£ introduced in our country in 1940, it was envisaged that health visitors would be provided in all clinics for preventive work in the homes of patients. Since most of the patients at that time were bed ridden, the health visitors were also a link between the clinic and the patient in the home. With the advent of chemotherapy, the patients are up and about and the symptoms disappear quickly and the infective potential is considerably reduced. In other words, the erstwhile duties of a health visitor have become relatively unimportant. The main function of the health visitor in these changed conditions is to make the patients take the treatment regularly since irregularity is the most important cause of treatment failure. It is assumed that repeated motivation by the health visitor would make the patients more regular and a home visit in case of default lead to speedy retrieval. It was seen in urban clinics that the patients from city proper (to whom home visiting was available) were more regular than those who came from the mofussil and to whom, therefore, home visiting was not available. It is however possible that the difference in the urban and rural patients could have been due to some other factor also since no controlled trials were carried out.

Lately, doubts have arisen about the real contribution of home visiting for preventing and/ or retrieving drug default. Garai and Sen (1976) reported no significant difference in the extent and pattern of irregularity in a rural set up whether the home visiting was by a unipurpose or multipurpose worker or there was no home visiting at all. A study was, therefore, planned to find out if home visiting made any difference in the regularity of drug taking in an urban population.

Material & Methods

All cases of pulmonary tuberculosis residing in the domiciliary treatment area of the New Delhi Tuberculosis Centre and supposed to be bonafide residents were included in the study. Every patient's home was visited once within one; week of starting treatment to give the routine advice and motivate and also to find out whether the patient was definitely living in the area at the registered address and was otherwise eligible for inclusion in the study. Thereafter, for purposes of home visiting, the patients were randomly allocated to one of the 3 groups described below:

Group P All patients visited 1 to 3 days *before* due date of drug collection for pill counting and repeat motivation, the aim being to *prevent* default

Group R Defaulting patients visited within 3 days of occurrence of default for *retrieval.* Two more visits during next two weeks, if necessary.

Group C *Control* Group: No home visiting for drug default. Repeat motivation of patient on each visit to the clinic.

All patients were issued free drugs for 4 weeks at a time. Drug collection was considered as an evidence of drug consumption except in those patients where pill counting was carried out as per protocol in group P patients. The intake started on December 1, 1975 and this interim analysis is based on 137 patients who completed at least 24 weeks' treatment before 15th October, 1976. Of these, 28 patients had to be excluded from the study within the first 12 weeks; 21 cases had migrated; 4 had died and 3 were initial defaulters and they took no treatment. Another 15 patients who completed 12 weeks' treatment dropped out before completing 24 weeks' treatment. Of these 15, 12 migrated; 1 died and 2 became uncooperative and stopped treatment although they were still living in the area. One patient was hospitalized for the major portion of treatment beyond 12 weeks and had therefore to be excluded from analysis. The 3 initial defaulters are not included in the analysis but the other 2 who stopped treatment between 12 & 24 weeks have been included and counted as 'grossly irregular', as they constitute failure of home visiting.

Regularity in drug collection is an important

* Paper presented at the 31st National Conference of Tuberculosis & Chest Diseases' Workers, Lucknow, 1976.

Table 1

Regularity during first 12 weeks' treatment

	Total patients	Patients with Regularity			
		>95%	>90%	>80%	<80%
Group P	32	23 72%	30 94%	32 100%	0 0%
Group R	39	22 56%	30 77%	35 90%	4 10%
Group C	38	20 53%	23 60%	28 74%	10 26%

yardstick by which efficiency of home visiting can be assessed. It has been defined as

$$\frac{\text{Drugs collected during any period}}{\text{Drugs which should have been collected during the period}} \times 100$$

e.g. a patient collecting 81 days' drugs during any 90 days' period is said to be Regular to the extent of $\frac{81}{90} \times 100 = 90\%$. Those with a regularity of below 80% have been considered as 'grossly irregular'.

Results and Discussion

Table 1 shows the distribution of 109 patients included in the study. Thirty two belong to group P, 39 to group R and 38 to group C. The patients in the 3 groups were broadly comparable in respect of age, sex, extent of disease and sputum status.

Table 1 also shows the degree of regularity attained in the 3 groups during the first 12 weeks' treatment. It would be seen that whether the standard of the regularity is taken as 95%, 90 % or 80 %, the results in groups P and R are significantly better than in group C, where it will be remembered there was no home visiting. Although there is a slight difference between groups P&R but this is not significant. It is also worth noting that all patients in group P had a regularity of at least 80% during the first 12 weeks of treatment.

Table 2 shows the degree of regularity in the 3 groups during the entire 24 weeks' period. The conclusions of table 1 are further corroborated by table 2 though it would be noted that there is a fall in the degree of regularity notably in group C during 12 to 24 weeks' period. This was but expected since most patients lose all symptoms by about 3 months and earlier studies have shown that relief of symptoms is the most important factor which is conducive to drug default.

An attempt was made to correlate regularity with other factors like age, sex, educational and economic status of the patients and/or other most important and responsible member of the family. Because of small numbers no significant differences in the 3 groups are seen in respect of these factors though there is a suggestion that irregularity is perhaps more among the educated and economically better off families.

It may further be pointed out that regularity is but a means to the end which is success of treatment clinically. The clinical results at the end of 24 weeks were also analysed in relation to the degree of regularity. However because of small numbers, no valid conclusions are possible at this stage regarding minimum standard of regularity needed to achieve satisfactory clinical results. This index would be of considerable practical importance since home visiting is costly and if a lower standard of regularity can help to achieve the same degree of clinical quiescence, the inferiority of group C may not have the same influence on ultimate success. Furthermore, the somewhat higher degree of regularity in group P as compared to group R will have to be balanced against. Two factors viz. (i) clinical response, (ii) cost of home visiting involved in

Table 2

Regularity during first 24 weeks' treatment

	Total patients	Patients with Regularity			
		>95%	>90%	>80%	<80%
Group P	30	19 63%	26 87%	28 93%	2 7%
Group R	32	18 56%	22 69%	28 88%	4 12%
Group C	31	11 35%	18 58%	20 64%	11 36%

the two groups. Although it is too early to assess the first factor at this stage, some information is available in respect of the second factor. Average number of home visits per patient in 24 weeks in group P was 7.1 as against 2.0 in group R. The former figure for group P of course, includes 6 routine visits per patient as per protocol.

To sum up, the interim analysis shows that home visiting definitely helps to reduce default and increase the regularity of drug collection. Whether the policy of "Preventive" visiting pays better dividends than retrieving defaulters still remains to be seen.

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DISSEMINATED TUBERCULOSIS AND ABNORMAL HAEMOPOIETIC RESPONSES

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Disseminated tuberculosis, a disease capable of inciting a variety of abnormal haemopoietic responses and simulating primary blood disorders, is discussed on the basis of observations in 20 cases. While all cases studied had anaemia, normocytic and normochromic type was the commonest. In leucopoiesis, leukaemoid reaction simulating chronic myeloid leukaemia, posed diagnostic difficulties in 2 cases, who ran a rapidly downhill course and expired. Abnormality of individual cell type was present in as many as 19 cases. Among the six cases of thrombocytopenia, only one case with pancytopenia caused any therapeutic problem. The aetiological diagnosis of tuberculosis in this case as well as in another with pancytopenia was established only at necropsy. The haematological abnormalities were reversible after effective treatment with antituberculosis chemotherapy in 16 cases. The lone case of plasmacytosis, has defied satisfactory explanation. There were no cases of polycythemia, basophilia or thrombocythemia in this series.

Introduction

Abnormal haematological responses have been reported in cases of disseminated tuberculosis for many years. The major abnormalities encountered are folate-deficient megaloblastic or aplastic or hypoplastic anaemia, leukaemoid reaction, pancytopenia, myelofibrosis or thrombocytopenia. These changes are not uniform in all the cases and a cause and effort relationship is not yet clearly established. Immunological aberrations, alteration in the control mechanism of granulocyte production and toxic depression of the marrow are some of the hypothetical mechanisms postulated.

Antemortem diagnosis of cases of disseminated tuberculosis simulating a blood dyscrasia is often difficult in the absence of overt clinical clues, suggestive radiological signs and a positive tuberculin test. Recrudescence of an old focus or opportunistic infection with Myco. tuberculosis can occur in a patient with a primary blood disorder due to malnourishment, alcoholism, diabetes mellitus, drug treatment and impaired immunological defences and cause diagnostic and therapeutic problems.

An account of 20 cases of disseminated tuberculosis with "blood dyscrasia" is presented to emphasise the need of being aware of tuberculosis, when assessing cases of unexplained pyrexia with associated blood dyscrasia.

Material and Methods

20 cases of unexplained fever of 1 to 25 weeks' duration, with abnormal blood pictures, seen during the last 9 years, were studied in detail. The follow up was for a period of one to three years. These cases were systematically investigated on the lines of pyrexia of uncertain origin with due care.

Where bacteriological confirmation of tuberculosis could not be obtained either antemortem or postmortem, the minimal acceptable diagnostic criteria, in the form of miliary nodulations in repeated chest X-rays or histologically tuberculous granuloma in lymph nodes, liver, bone-marrow, pleural, peritoneal or laryngeal biopsy or lymphocytic pleocytosis with raised protein in cerebrospinal fluid singly or in combination were accepted.

Results

The age, sex, salient clinical, laboratory and radiological features of these 20 cases have been given in Table 1.

4 female and 16 male patients formed the series. 12 patients were under the age of 30 years and 8 patients over that age. The ages of the patients ranged between 18 and 51 years.

Pyrexia was the presenting feature in all the cases and the duration of pyrexia ranged between 7 and 180 days. Thus, 6 patients had fever of 7 to 30 days' duration, 7 cases 31 to 60 days, 2 cases upto 90 days and 5 cases upto 180 days. All patients had pallor and wasting in addition to Pyrexia Other significant physical findings consisted of hepatomegaly in all 20 cases, splenomegaly in 11 cases and lymphadenopathy in 7 cases. Abnormal chest signs were present in only 4 cases.

Abnormal chest skiagram, consisting of miliary nodulations only was seen in 11 cases; miliary nodulation with pleural effusion occurred in one case, with consolidation in 3 cases, and with mediastinal mass in one case. There was only consolidation in one case. In 3 cases chest X-ray was normal. The first appearance of miliary nodulations in chest skiagram varied from two to twelve weeks from the date of onset

Table 1

Summary of salient clinical, laboratory and radiological features in 20 cases

Case serial number	Name of the patient	Sex	Age	Duration of pyrexia in days	Clinical presentation	Physical findings	X-ray chest	Sputum for AFB	Tuberculin test	Result of ATT	Haematologic response	Remarks
1	JY	M	32	30	1, 2, 3, 4	6	N	—ve	—ve	P	P	PM Areactive DT
2	SD	M	30	105	1, 2, 3, 4	6, 7	N	—ve	—ve	P	P	PM Areactive DT
3	RN	M	28	60	3, 4	6, 7	N	—ve	—ve	P	P	PM Areactive DT
4	AM	M	20	70	3, 4	6	M	—ve	+ve	G	G	Well at 3 years
5	MS	M	21	49	3, 4	6	M	—ve	+ve	G	G	Well for 2 years
6	VY	M	20	36	1, 2, 3, 4	5, 6, 7, 8	M, PE	—ve	+ve	G	G	Well for 2 years
7	SN	F	46	40	3, 4	6	M	—ve	+ve	G	G	Well for 1 year
8	MR	M	38	180	3, 4	6, 8	C	+ve	+ve	G	G	Well for 1 year
9	NK	F	18	7	3, 4	5, 6, 7	M	—ve	+ve	G	G	Well for 1 year
10	RK	F	27	20	3, 4	6, 7	M	—ve	+ve	G	G	Well for 1 year
11	RN	M	18	15	3, 4	5, 6, 7	M, C	+ve	+ve	G	G	Well for 3 years
12	SS	F	36	120	3, 4	6, 8	mG M	—ve	+ve	G	G	Well for 1 year
13	JN	M	50	60	3, 4	6, 7, 8	M	—ve	—ve	G	G	Well for 1 year
14	TD	M	22	60	3, 4	6, 8	M	—ve	—ve	G	G	Well for 1 year
15	JP	M	43	150	3, 4	6, 7	M	—ve	+ve	G	G	Well for 1 year
16	HB	M	20	30	3, 4	6, 8	M	—ve	—ve	P	P	PM Areactive DT
17	SS	M	20	20	3, 4	5, 6	M	—ve	+ve	G	G	Well for 1 year
18	VS	M	51	105	3, 4	6, 7	C, M	+ve	—ve	G	G	Well for 1 year
19	AB	M	25	60	3, 4	6, 7	C, M	+ve	—ve	G	G	Well for 1 year
20	ES	M	26	75	3, 4	6, 7, 8	M	—ve	+ve	G	G	Under follow up

M : Male, F : Female, 1 : Palpitation, 2 : Dyspnoea, 3 : Pallor, 4 : Wasting, 5 : Abnormal Chest Findings, 6 : Hepatomegaly, 7 : Splenomegaly, 8 : Lymphadenopathy, N : Normal, M : Miliary Nodulations, C : Consolidation, PE : Pleural Effusion, mG : Mediastinal Mass, —ve : Negative, +ve : Positive, P : Poor, G : Good, PM : Postmortem, DT : Disseminated Tuberculosis, ATT : Antituberculosis therapy, AFB : Acid Fast Bacillus.

Table 2

Abnormal hematological responses in 20 cases of disseminated tuberculosis

Abnormal Hematological Responses	Total number of cases	Number of cases in each type of abnormal response
Erythropoietic	20	
Aplastic Anaemia		1
Iron deficiency anaemia		5
Megaloblastic anaemia		2
Normocytic normochromic anaemia		12
Leucopoietic	9	
Leucopenia		4
Leucocytasis		3
Myeloid leukaemoid reaction		2
Abnormality of individual cell-type	19	
Neutropenia		4
Neutrophilia		8
Lymphocytosis		4
Eosinophilia		1
Monocytosis		2
Thrombopoietic	6	
Thrombocytopenia		6
Others	1	
Plasmacytosis		

of the disease. Sputum was positive for AFB in only 4 cases and tuberculin test was positive in 12 cases.

The abnormal haematological responses in these cases have been shown in Table 2. All the 20 cases had anaemia. The variety of anaemia consisted of aplastic anaemia in 1 case, iron deficiency anaemia in 5 cases, megaloblastic anaemia in 2 cases and normocytic and normochromic anaemia in 12 cases. Only 3 patients (Case Nos. 1,2 and 6) had symptoms of anaemia in addition to the symptoms of primary disease. Leucopoietic abnormality was observed in 9 cases, leucopenia in 4 cases, leucocytosis in 3 cases and myeloid leukaemoid reaction in 2 cases. Abnormality of individual cell-type was seen in 19 cases, neutropenia in 4 cases, neutrophilia in 8 cases, lymphocytosis in 4 cases, eosinophilia in .1 case and monocytosis in 2 cases. Out of 6 cases with thrombocytopenia, only one case with pancytopenia manifested bleeding problem. Plasmacytosis was seen in one case.

4 cases showed poor response to antituberculosis chemotherapy and died within one to three weeks after hospitalization. 16 patients showed good response to antituberculosis chemotherapy and were alive and well during the follow up period of 1 to 3 years.

Discussion

The clinical and laboratory study of 20 cases of disseminated tuberculosis in this series and review of reports in the literature have shown that various types and grades of haematological abnormalities occur in cases of disseminated tuberculosis. This disease can be divided into acute chronic forms. The acute forms of the disease may further be divided into the "Reactive" (where tissue and cellular response to the invading bacillus is brisk) and the "Non-reactive" or "Areactive" (where tissue and cellular response is either not present or only minimally present). The chronic forms of the disease are usually "Non-reactive" (1, 11). The haematological abnormalities occur exclusively in cases of non-reactive disseminated tuberculosis(l). It is interesting to note that the two principal types of haematological responses on challenge with Myco. tuberculosis are, reactive hyperplasia and exhaustion hypoplasia. These responses can be selective (erythroid only or erythroid and myeloid only) or total (pancytopenia). Metaplasic changes can also take place.

Abnormalities of Erythocytic Responses

Iron deficiency anaemia was not common in this series. Normochromic and normocytic anaemia was the commonest abnormal erythrocytic response. The currently accepted view on the causation of this type of anaemia, is the inability of the bone marrow to compensate for a mild to moderate diminution of erythrocyte life span (2). But the alteration is so subtle that deviations from normal in the reticulocyte count, serum bilirubin or stool and urine urobilinogen are seldom seen.

The megaloblastic anaemia in 2 cases was unrelated to malabsorption or dietary deficiency of folate or ingestion of a drug like para-aminosalicylic acid. Treatment with antituberculosis drugs eventually improved the anaemia. The megaloblastic anaemia in tuberculosis has been recorded by many authors and the mechanisms suggested are over-utilization of folate, relative dietary deficiency or possible circulating folate antagonist (1, 5). Tuberculosis at the anatomic site of vitamin B_{12} absorption in the ileum may also cause megaloblastic anaemia.

Besides total hypoplasia of exhaustion, miliary foci-teeming with acid-fast bacilli with almost no cellular response in bone marrow at necropsy study was the cause of aplastic anaemia in case No. 2. In other series extensive marrow damage by tuberculous granulomata was the suggested mechanism of aplastic anaemia (4,15).

Abnormalities of Leucocytic Responses

Besides the abnormalities of leucocyte already recorded, a few atypical presentations were also observed. Case No. 2 (Table 1), reported with unexplained pyrexia of 105 days duration along with a necrotic ulcer at the anal margin, perpetual feeling of shivering, profuse sweating, anorexia, wasting and hepatosplenomegaly. Blood count was marked by pancytopenia with 10% neutrophils, platelet count of 42,000/cm and severe anaemia. X-ray chest was repeatedly normal and the tuberculin test was negative. Bone marrow aspiration twice failed to produce any marrow. No aetiological cause could be established during life. Necropsy revealed non-reactive disseminated tuberculous foci in lungs, liver, spleen, bone marrow and lymph nodes with acid-fast bacilli. This case gave a history of having taken chloramphenicol during the earlier phase of the illness, which was regarded as a significant contribution to the final outcome. Case No. 20 (Table-1), presented with prolonged pyrexia of 75 days' duration, chill, sweating, progressive weakness, anorexia, a few small discrete non-tender lymph nodes in the left supraclavicular and cervical regions, hepatosplanomegaly and profound neutropenia. Tuberculin test showed a weak-positive response (Steroid was given). A chest X-ray taken 4 months after the onset of the illness showed for the first time miliary densities in both lung fields. Histopathological examination of a lymph node provided the bacteriological diagnosis of tuberculosis. Patient satisfactorily responded to antituberculosis chemotherapy with reversal of haematological abnormalities. Cases NCK. 1 & 16 (Table 1) of disseminated tuberculosis with leukaemoid reaction of myeloid type, on the other hand, presented with an acute illness of short duration, ran a fulminant clinical course and died shortly due to peripheral circulatory failure. Diagnosis was confirmed at necropsy, which showed multiple non-reactive disseminated tuberculous foci in many organs including bone marrow, teeming with Myco. tuberculosis. There was no leucocytic infiltration in any organ or tissue in either case, thus excluding leukaemia.

Leucopenia and/or neutropenia has been noted as one of the important haematological abnormalities (15, 8, 13) only in overwhelming infection of all types, particularly acute forms of disseminated tuberculosis and septicaemic states.

The toxic depression of marrow neutrophil reserve, combined with undernourishment, alcoholism, use of marrow depressing drugs, irradiation or even primary haematological diseases has been the usual explanation (1). The direct invasion of marrow by miliary tubercles has also been suggested as the cause of leucopenia. Infrequently, minimal leucocytosis has been noted in localised tuberculosis. But spread of tuberculous infection is usually associated with leucocytosis and neutrophilia (5, 8, 13).

The monocyte plays an important role in the cellular reaction to Myco. tuberculosis. The phospholipids of the organisms are partially degraded in the monocytes and macrophages and cause the transformation of these cells to epitheloid cells (16 b). The monocyte is thus the chief cell in new tubercle formation. This activity may be reflected in the blood, monocytosis being regarded as evidence of active extension of the disease process. On the other hand, lymphocytosis is indicative of healing tuberculosis. Peripheral eosinophilia associated with disseminated tuberculosis treated successfully with chemotherapy is also on record. The association seems to be an immunological phenomenon. The exact significance of the presence of plasma cells in the peripheral blood of case No. 16 could not be satisfactorily explained. Serum electrophoresis of this patient however showed hypergammaglobulinemia.

Only two cases of leukaemoid reaction of myeloid in type were seen in this series. This type of leukaemoid reaction has been a frequently reported abnormality with disseminated tuberculosis. Leukaemoid reaction of lymphocytic variety has also been reported. The haematological picture simulates either acute or chronic type of myeloid or lymphocytic leukaemia. Only one case of monocytic leukaemoid reaction associated with tuberculosis and a mediastinal teratoma has been reported so far (9). The distinction between non-neoplastic and neoplastic disorder of leucocytes is not always easy (10). Bone marrow aspirates and their examination are of great help in the differentiation. The use of ancillary diagnostic aids such as leucocyte, alkaline-phosphatase score, serum vitamin B_{12} level and karyotype analysis for the Ph-1 chromosome may also be helpful. The suggested pathological mechanism causing such a blood disorder is either a hypersensitivity reaction to tuberculous protein in an already sensitized human and/or a disturbance of the control mechanism regulating granulocytopoiesis (14, 16a). Both these mechanisms have animal experimental support (16 c). It has also been suggested that the presence (and probably overgrowth) of a "leukovirus" in an animal with depleted body defences may result in a leukaemoid reaction (16c).

The association of leukaemia with tuberculosis has been reported by many authors (12). It has been postulated that Myco. tuberculosis like viruses, may incite the haematological disorders, or that debilitating states of leukaemia and myelofibrosis, predispose to tuberculosis in a non-specific way. Use of steroid, cytotoxic drugs and irradiation have also been implicated as predisposing factors to tuberculosis.

Abnormalities of Thrombocytic Response

Six cases with thrombocytopenia were observed in the series. Out of these, only one case (Case No. 2), that of pancytopenia, was severe enough to produce bleeding and a therapeutic problem. This patient ultimately died of peripheral circulatory failure. There was no case of thrombocytosis. Many authors (1, 4, 6) have reported thrombocytopenia as part of the pancytopenia in disseminated tuberculosis. The mechanism of this haematological abnormality is the same, by and large, as that of pancytopenia. Some evidence of direct interaction between bacteria and platelets in circulation has been demonstrated experimentally (3). It is not confirmed if this also occurs in disseminated tuberculosis.

Conclusion

20 patients of disseminated tuberculosis studied, displayed some form of haemopoietic abnormalities. The association of unexplained pyrexia and abnormal haematological findings should direct investigation in the line of disseminated tuberculosis which will lead to early diagnosis and institution of antituberculosis therapy. X-ray diagnosis of disseminated tuberculosis may take time to give a diagnostic clue and as such serial X-rays are of immense value. Since in many cases as both clinical evidence and laboratory confirmation of tuberculous aetiology may be delayed one may have to undertake procedures like biopsies of liver, lymphnodes or bone marrow, such materials may also grow Myco. tuberculosis, if submitted to culture. The necessity for such elaborate diagnostic effort will be amply rewarded, for institution of antituberculosis drug therapy usually reverses the whole picture.

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INTESTINAL TUBERCULOSIS-CLINICOPATHOLOGICAL STUDY OF 25 CASES

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Intestinal tuberculosis is fairly common in India. The precise incidence in India has not been determined due to lack of surveys in random samples of population. The frequency of intestinal involvement secondary to pulmonary tuberculosis varies from Ito90% (Chuttani, 1970) and the incidence of isolated or primary tuberculosis in different series reported varies from 0.02 to 5.1 % (Tribedi and Gupta, 1971, Chuttani 1970 and Pimparker & Donde, 1974).

In this communication, 25 cases of intestinal tuberculosis are reported.

Material and Methods

The material consisted of 25 cases of intestinal tuberculosis reported at Osmania General Hospital, Hyderabad. Duration of symptoms ranged from a few months to 2 years. Routine laboratory investigations were done. Radiological examination of the chest, barium meal and barium enema studies were also carried out. Whenever indicated, plain X-ray of abdomen was also taken. All the 25 patients were treated surgically. Right hemicolectomy and resection of the gut was performed and specimens were sent for histopathological examination. Culture studies were not undertaken. Histologically proved cases were put on antituberculous chemotherapy consisting of streptomycin 1 gm daily for 90 days followed by para aminosalicylic acid (PAS 9 gms and JNH 300 mgs daily for 18 months.

The sex distribution was predominantly female. Out of 25 cases, 16 (64%) were female and 9 (36 %) were males. Majority of the cases (64%) were in the age group of 11-30 years.

Abdominal pain was the commonest symptom. Other non-specific symptoms such as weight loss, fever, anaemia were encountered in 80% of cases. Mass was palpable in 15 out of 25 cases (60%).

Two cases had ileal perforation (8 %) and 23 cases (92%) had obstruction. The commonest site of lesion was the ileocaecal region (15 out of

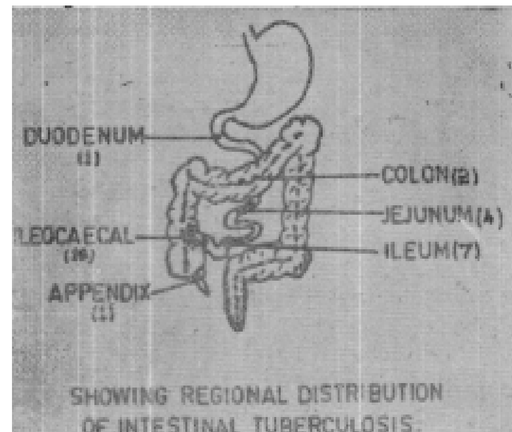

Fig. 1

Showing distribution of tuberculous lesions in gastro-intestinal tract

Table I

Showing age and sex distribution in the present series of 25 cases

Age in years	11—20	%	21—30	%	31-40	%	41—50	%	Total	%
Male	1	4	4	16	3	12	1	4	9	36
Female	8	32	4	16	4	16			16	64
	9	36	8	32	7	28	1	4	25	100

*Presented at the 16th Annual Conference of Indian Society of Gastroenterology held at Bombay in November 1975.

Table II
Showing Symptoms and Signs in 25 cases of Intestinal Tuberculosiss

	No.	Percentage
Symptoms		
Abdominal pain	25	100
Weight loss	20	80
Fever	20	80
Borborygmi	20	80
Diarrhoea	6	24
Constipation	4	16
Signs		
Mass in abdomen (Right iliac fossa)	15	72
Anaemia	18	72
Distension of abdomen	4	16
Visible peristalsis	4	16
Evidence of perforation	2	8
Paralytic ileus	2	8

Table III
Plain X-ray abdomen in intestinal tuberculosis

	No of Patients	*Percentage*
Fluid levels	1	4
Distension of intestine	2	8
Pheumo-Peritoneum	1	4
Normal	21	84

25 cases or 60% The terminal ileum and mesenteric glands were involved in 5 and 14 cases respectively

Table IV
Occurrence of associated pulmonary tuberculosis

	Number	Percentage
Active Minimal	2	8
No evidence	23	92

Table V
Barium contrast study

	No. of Percentage	patients
Sub acute intestinal	4	16
Obstruction due to stricture of small intestine		
Ileocaecal tuberculosis with stricture of small intestine	4	16
Ileocaecal tuberculosis	6	24
Not done	11	44

Table VI
Operative procedures

	Number	Percentage
1. Right hemicolectomy	16	64
2. Small intestinal resection with entero-enterostomy	7	28
3. Right hemicolectomy with proxi-mal small intestine resection	3	12
4. Mesenteric lymph gland biopsy only	2	8

Table VII

Showing the regional distribution of tuberculosis

Portion of gut involved	*No. of cases*	*Percentage*
1. Colon	2	8
2. Jejunum	4	16
3. Ileum	7	28
4. Appendix	1	4
5. Ileocaecal	16	64
6. Duodenum	1	4
7. Mesentcric glands (in addition to intestinal involvement)	15	—

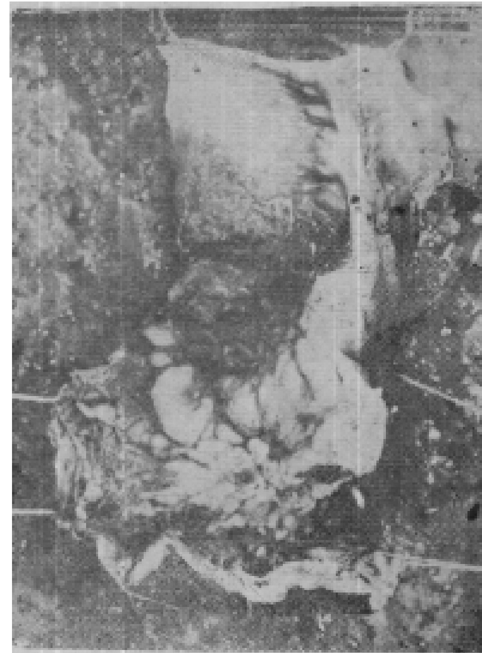

Fig. II

Showing ulcerohypertrophic lesions with eobblestoning of the mucosa in the ileocaecal region.

Table VIII

Gross and histopathological features in 25 cases of intestinal tuberculosis

	No. of cases.
Macroscopic :	
1. Miliary nodules on serosa	8
2. Strictures (less than 3 cms)	11
3. Perforation	2
4. Internal fistulae	Nil
5. Ulcers transverse, circumferential	24
Microscopic :	
1. Granule ma :	
(a) Intestine and Mesentery	24
(b) Lymph node Mesenteric	15
2. Caseation :	
(a) Intestine	19
(b) Lymph node mesenteric	15
3. Surrounding fibrosis	10
4. Fissures	Absent
5. Fibrosis of muscularis propria	15

Fig. Ill

Showing caseation in the mesenteric lymph node

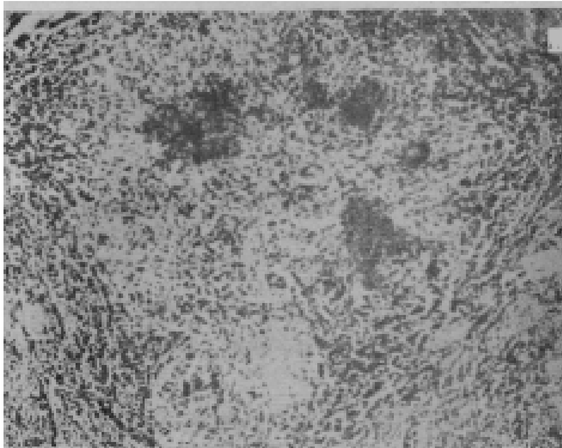

Fig. IV

Characteristic tuberculosus granulematous lesion showing caseos necrosis in the centre and prominent cuff of lymphocytes and plasma cells at the periphery H & EX 60.

Majority of the cases had ulcerohypertrophic lesion. In 24 out of 25 cases ulcers were multiple and most of these were less than 3 cm in length. They were superficial and presented a variable appearance. Tuberculous granuloma consisting of Langhans giant cells, epitheloid cells were seen in all the cases. Caseation necrosis which is a hall-mark of tuberculosis was observed in 15 intestinal and 14 lymph nodal lesions.

Discussion

Tuberculosis still constitutes the most important single aetiological factor in ulceroconstrictive lesions of the intestine in India (1,6,9,12,14).

The commonest site for tuberculous involvement of the bowel is the ileocaecal region (64%) as observed in the present series and also in the earlier reports published (2, 4, 6, 7, 9, 14). The other regions of gut involved in a decreasing order of frequency are the ileum, caecum, ascending colon, jejunum, appendix, sigmoid colon, rectum, duodenum, stomach and esophagus (3, 9, 11).

The symptomatology of intestinal tubesculosis depends on the site, the extent, the duration and the type of involvement. The clinical and gross morphological manifestations of this disease are protean and mimic a number of diseases. Intestinal tuberculosis is common in the 2nd and 3rd decades (4, 9, 14). This is in conformity with our series. In the present series 23 out of 25 had obstruction and 2 cases had perforation which is in accordance with the earlier reports (1,4,7,8,11).

Morphologically the lesions in intestinal tuberculosis are classified into ulcerative and ulcero-hypertrophic varieties (14). The distinction between these two lesions is not sharp and the two types may co-exist. The macroscopic features presented a very wide range, and at times distinction from Crohn's disease may be difficult. Confluent granuloma, presence of caseation necrosis, presence of granuloma in lymph node in the absence of granulomatous lesions in the intestine, absence of transmural cracks and fissures (present in Crohn's disease) serve to distinguish intestinal tuberculosis from Crohn's disease. Caseation necrosis remains a very important criterion for the histological diagnosis of intestinal tuberculosis.

In the present series right hemicolectomy was done in 16 cases of ileocaecal tuberculosis. Resection of the affected segment and anastomosis was carried out in 7 cases.

One patient expired post-operatively, 8 were lost for follow-up and of the 16, 8 were followed up for 1 year and rest for 2 years and were free of symptoms.

Summary

25 cases of intestinal tuberculosis presenting with acute, subacute and chronic symptoms were studied. Abdominal pain was the most common symptom. Mass was palpable in the right iliac fossa in 60 % of cases. Surgical treatment consisting of right hemicolectomy and segmental resection and anastomosis was carried out in all the cases. Ileocaecal region and ileum were the most common sites of involvement. Ulcero-hypertrophic lesion was seen in 24 cases and one had ulcerative lesion. Confluent granuloma and caseation necrosis, hall marks of tuberculosis were seen in all the cases studied.

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DRUG DEFAULT IN TUBERCULOSIS

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The problem of drug default is as old as chemotherapy itself. It has been encountered in all those diseases where the drugs have to be administered for a long time. However, it assumes a social significance in tuberculosis, because a drug defaulter in this diseases poses a threat not only to himself, but also to the community he lives in, by spreading the drug resistant organisms. For the T.B. clinics, it poses many additional problems e.g. default actions, retrieval of defaulters and reorganisation of the chemotherapeutic schedule.

The definition of drug default in tuberculosis is beset with many controversies; though it is generally agreed that if a person fails to collect 12 monthly supplies of pills within a space of 15 months, he should be labelled as a defaulter. This definition, though widely accepted, implies that a person may continue to miss the consumption of his pills every month by at least 25 %, yet he can still be labelled as regular. To top it, the N.T.I, manual for the treatment organisers suggests default actions be initiated if the patient does not turn up within 3-4 days of his due date and that he may be labelled as "lost" if he has been absent for 8 weeks after the due date. Therefore, while this definition may be considered to be "practicable", it certainly has its own limitations.

The present report relates to our experience in Kasturba T.B. Clinic. K.G's Medical College, Lucknow.

Material and Methods

Kasturba T.B. clinic serves as a peripheral unit of Govt. T.B. Clinic, Lucknow. It has a health visitor and is visited by one or two senior physicians from the department of tuberculosis and respiratory diseases, K.G's Medical College, every day. The clinic work is conducted with the help of a chief resident, 2 senior residents, 2 junior residents and 4 house officers, besides the ancillary staff. The clinic has an X-ray plant with screening facilities, besides the facilities for a routine laboratory, drug distribution and prevention *(i.e.,* B.C.G., Mantoux test and if needed chemoprophylaxis). The treatment cards are maintained according to the accepted norms laid down for the T.B. clinics. The details of new cases started on the treatment are sent every week on form M.F. 48 to the Govt. T.B. Clinic. The treatment cards are checked daily by the senior author (B.K. Khanna).

The default action taken in our clinic is slightly different, to suit our work load and our resources. If the patient does not turn up within 72 hours, a postcard is sent to patient's home. If there is no response, after a week of his due date, another post card is sent and if feasible, the health visitor visits the patient's home to retrieve him. If still the case does not turn up, another post card is sent at the end of 2 months of the due date after which the card .is "closed". If the patient reports after 2 month of the due date, a new treatment card is filled in for the patient.

The drugs available for distribution from the clinic include either thioacetazone and isoniazid combination (monthly supply) or streptomycin and isoniazid administered intermittently (supervised). The intermittent regimen is given only to those patients who live in close proximity to the clinic and who agree to attend the clinic twice a week for the same. For these reasons, the two groups are not strictly comparable, because whereas T+H regimen is available to anyone residing within the district of Lucknow, intermittent therapy is administered to only those residing in and around Chowk, a mohallah, where the clinic is located. Besides, if a person on intermittent therapy has defaulted 3 times, he is switched over to daily regimen (T+H or PAS+ INH). The patients on PAS+1NH regimen have not been included in this study, because of the irregularity in the supply and availability of the drug from this clinic.

The treatment cards of a total of 400 untreated cases of pulmonary tuberculosis inducted during the last one year at our clinic were analysed and the data obtained are presented below. For this study, a patient was labelled as defaulter if he failed to turn up within 72 hours of the due date.

Discussion

The various causes of drug default as seen in our study can be broadly grouped as those relating to the patient, those relating to the clinic, those relating to the disease, those relating to the drugs and miscellaneous causes.

Table 1

Showing the overall position of the patients at the end of one year of therapy

1.	Period of study	July 1975 to October 1976.
2.	Total registered cases	400
3.	Number of patients falling out of the visiting area	70
4.	Total No. of cases which were not traceable (either due to wrong addresses or incomplete addresses)	58
5.	Total number of cases included in this study	
		272
6.	Total number of cases	
	INH+TZN Gp	
	Biweekly Gp	224
7.	Total number of defaulters :	48
	INH+TZN Gp	172 i.e. 75.9%
	Biweekly Gp	22 i.e. 45.8%

Table 2 ;

Showing the total number of cases in different groups

Months	No. of cases		Total No. of cases
	INH+TZN Gp	Biweekly Gp	
12	87	18	105
6	65	15	80
4	72	15	87
Total	224	48	272

Table ‘<

Months	Total No. of cases	Number of defaulters	
		Number	Percentage
12	18	9	50.0%
6	15	6	40.0%
4	15	7	46.6%
Total	48	22	45.8%

Table 3

Showing the total number of defaulters in INH+TZN Gp.

Months	Total No. of cases	Number of defaulters	
		Number	Percentage
12	87	68	78.2%
6	65	50	76.9%
4	72	54	75.0%
Total	224	172	75.9%

Factors relating to the patients include a careless and forgetful personality of the individual, failure to accept the diagnosis and family problems, which, taken together, would account for at least 30 % of the total causes. This factor has recently been emphasised by Singh, *et al* (1976) and is the possible factor behind the drug default, as seen amongst even 4—33 % of hospitalised cases of tuberculosis (Tuberculosis Chemotherapy Centre 1959). The only solution, which indeed, has proved to be rather futile, to this aspect of the problem, is intensive motivation of the patient in the clinic.

Factors relating to the clinic, as seen in our study, include clash of clinic timings with working

Table 5

Showing the details of the patients remaining on treatment and making various numbers of defaults (INH+TZN Gp)

Months	Total No. of cases	Regular Patients	Total No. of defaulters (Inclusive of lost cases)		Lost cases		Defaulters remaining on treatment	Number of defaults made by defaulters							
								Once		Twice		Thrice		4th & above	
			Number	Percentage of total cases	Number	Percentage of defaulters		Number	Percentage of defaulters on treatment	Number	Percentage of defaulters on treatment	Number	Percentage of defaulters on treatment	Number	Percentage of defaulters on treatment
12	87	19 (22%)	68	78.16%	30	44.12%	38	20	52.63%	10	26.31%	3	7.9%	5	13.16%
6	65	15 (22%)	50	76.9%	24	48.0%	26	17	65.38%	5	19.22%	2	7.7%	2	7.7%
4	72	18 (25%)	54	75.0%	23	42.59%	31	20	66%	6	20%	5	14%	—	—

Table 6

Showing the number of patients making various numbers of defaults in the biweekly Gp.

Months	Total No. of cases	Regular Patients	Number of defaulters (inclusive of "lost" cases)	Lost cases		Defaulters remaining on treatment	Number of defaults done by defaulters					
							Once		Twice		Thrice	
				Number	Percentage of defaulters		Number	Percentage of defaulters on treatment	Number	Percentage of defaulters on treatment	Number	Percentage of defaulters on treatment
12	18	9	9	2	22.2%	7	2	28.51%	4	57.15%	1	14.28%
6	15	9	6	1	16.6%	5	1	20.0%	2	40%	2	40%
4	15	8	7	2	28.5%	5	1	20%	3	60%	1	20%

Table 7

Showing the various causes of defaults

Total No. of defaulters (excluding "lost" cases) : 112
Total No. of defaults : 210

Causes of default	Number	Percentage
1. Carelessness and forgetfullness	55	22%
2. No reason	15	6%
3. Time problem	41	16%
4. Transport problem	40	16%
5. Long distance	20	8%
6. Undue waiting in clinic	12	5%
7. Symptoms relieved	10	4%
8. Feeling of well being	4	2%
9. Relapse of disease	4	2%
10. Symptoms not relieved	4	2%
11. Patient not accepting that he is tuberculous	5	2%
12. Toxisity	13	6%
13. Family problems	12	5%
14. Not motivated	4	2%

N.B. The patients, as a rule, gave multiple reasons for the drug default. Only the most important of them have been listed here.

time of the patient, long distance of the clinic from the residence of the patients, and the transport problem. Taken together these factors account for 45 % of total default. This problem has also been encountered at other centres in this country (Pathak 1965), though their approach to tackle this problem has varied. For example New Delhi T.B. Clinic has started an evening service, T.B Demonstration and Training Centre, Agra has evolved mohallah clinics and Selvapathi (1971) has advocated financial subsidy for these cases. The response to all these measures adopted has been claimed to be encouraging. However, basically what we are lacking in Lucknow, is a coordinated urban T.B. control programme. That, no doubt, may to some extent, reduce the number of routine patients coming from far-flung areas of Lucknow. It may, however, be pointed out, that owing to its being the oldest T.B. clinic in Lucknow, to its attachment to a medical college of high reputation and with a backing of a 120 bedded hospital, our T.B. clinic will still have patients coming down to seek relief not only from the district of Lucknow but from the neighboring states.

Factors relating to the disease include relief of symptoms, feeling of well-being, relapse of the disease and failure to obtain symptomatic relief. These causes, on the whole, account for 10% of the total defaults. While the first two of these causes can be tackled with proper motivation, the other two causes imply either the problem of drug resistance or wrong diagnosis or associated diseases with tuberculosis which could not be diagnosed in the clinic. Approximately 25 % of our hospitalised tuberculosis patients have been found to be suffering from coexistent diabetes mellitus, chronic bronchitis, allergic rhinitis and tuberculous bronchitis, besides- many other medical problems such as nutritional anaemias,, worm infestations and malnutrition. For a balanced management of these cases, these coexisting conditions need to be investigated and treated concurrently. It is true the hospitalised cases can not be compared with those attending the clinic, but it must be realised that all of them have passed through one or more clinics without obtaining any relief before they entered our wards.

The factors relating to the drugs Included drug toxidty and failure to obtain relief with the drugs. Taken together these account for 8% of the total causes of drug defaults. Isoniazid-j-Thiacetazone combination in clinic practice has been found to be associated with severe drug reaction in 5 % of the cases (Gothi *et al* 1966). We encountered not uncommonly, symptoms unrelated to the disease or the drugs being attributed to the drugs e.g. impotence and sense of "heat" or "cold". Failure to obtain relief with the drugs has, already, been discussed in the previous para (vide supra).

The patients kept on intermittent therapy, were found to be rather more regular, compared to TZN+INH group and main causes of default in them related only to patient's factors and the family problems (vide supra).

Summary

Out of a total of 400 cases, only 272 cases could be followed up during the last 1 year in Kasturba T.B. clinic, Lucknow. Of these, 112

patients defaulted 210 times during a period ranging from 4 months to 1 year. 82 cases were "lost". The causes of default and their remedy have been discussed. The implementation of the urban T.B. control programme in the city of Lucknow is considered essential to minimise this problem.

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A CLINICAL STUDY OF SERUM FREE FATTY ACIDS IN PATIENTS WITH PULMONARY TUBERCULOSIS

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Introduction

The biochemical aspects of tubercular infection and disease have attracted attention for many years. Because of the complex biochemical composition of the tubercle bacillus and the chronicity of the disease in man, much interest has been directed to the biochemical changes brought about in the host.

Serum free fatty acids or nonesterified fatty acids are the forms in which fat is mainly carried from adipose tissue stores to meet the caloric demands of body. They exist in the plasma in the form of an albumin fatty complex (Goodman, 1958). The importance of serum free fatty acids in patients with pulmonary tuberculosis is emphasized by the fact that they are utilized and synthesized by mycobacterium tuberculosis (Dubos, 1945; Hedgecocks, 1968; Antoine and Tepper; 1969 and Kanamasa & Goldman; 1970). The present study was performed to determine the possible interrelationship between plasma free fatty acid levels and the extent of lesion and effect of therapy in patients with pulmonary tuberculosis.

Material and Methods

The subjects of this study included 10 controls and 50 patients with pulmonary tuberculosis. The controls were healthy volunteers having normal nutritional status and without any significant past illness. The patients of pulmonary tuberculosis (50) were taken from different medical wards, Chest Clinic and Chest Hospital of S.M.S. Medical College, Jaipur. Patients with extra pulmonary tuberculosis, emaciation, severe anemia, toxaemia and pregnancy were not included in the study. Out of these 50 patients, 10 patients were having inactive disease at the time of study. They had a past history of pulmonary tuberculosis and were taking antitubercular treatment. These patients had no clinical, laboratory or radiological evidence of active pulmonary tuberculosis at the time of study. All the 50 patients were of different age groups varying from 20 years to 50 years and of both sex.

A diagnosis of active pulmonary tuberculosis was established on the following lines viz: clinical history, physical examination, radiological evidence and laboratory investigations. The routine laboratory investigations included blood for TLC, DLC, Hb %, ESR (Wintrobe method) and also urine and stool examination. The sputum was examined microscopically for AFB after Ziehl-Neelsen staining. A culture of sputum was done in each case using Lowenstein-Jensen's medium and sensitivity for Streptomycin, Isoniazid and Para-amino-salicylic Acid (Primary drugs of tuberculosis) was performed. Only those cases with active disease were included in the study retrospectively who had positive sputum cultures on Lowenstein-Jensen's medium. Out of these 40 patients with active disease who had a positive sputum culture only 18 patients showed AFB under light microscopy on smear examination after Ziehl-Neelsen's staining, while 22 patients did not reveal presence of AFB on routine microscopic examination of sputum.

The patients of pulmonary tuberculosis were classified into three groups depending on the severity of the clinical disease (Scheme of Classification advocated by the National Tuberculosis Association of America) viz: (a) Minimal lesion, (b) with moderately advanced lesion and (c) with far advanced lesion. The estimation of serum free fatty acids was done by the colorimetric method of Datta & Chakrabarti (1969). The blood was collected in the fasting state and no drug known to influence serum, free fatty acids was administered for four weeks prior to the collection of blood samples.

Results

The serum free fatty acid levels in normal controls ranged from 0.174 mEq/L to 0.297 mEq/L with a mean = S.D. of 0.239 ± 0.041 mEq/L. A marked rise in serum levels was observed in patients with pulmonary tuberculosis as compared to normal controls (Table No. 1). The rise in serum free fatty acids was related to the extent of the lesion; thus the levels were highest in patients with far advanced tuberculosis (0.852 = 0.028 mEq/L) as compared to minimal lesion group (0.459 ± 0.089 mEq/L). A positive correlation between serum free fatty acid levels and the bacillary status of the patients was also observed. The patients with sputum positive (on smear examination) for acid fast bacillus excreting great number of organisms into environment had higher serum levels as compared to sputum smear negative patients (Table No. 2). In patients

with inactive disease who had received antitubercular therapy, the serum free fatty acids were reduced significantly (0.273±0.037 mEq/L) as compared to patients with active disease (0.673+ 0.029 mEq/L).

It was observed that the rise was more marked in patients who had bacilli sensitive to primary drugs of tuberculosis as compared to those with resistant bacilli. The rise was 25% more in sensitive cases (Table No. 3).

Table 1
Serum FFA levels in normal controls and patients of pulmonary tuberculosis

S. No.	*Case*	*No. of Cases*	*Serum FFA Levels*		*'P' Value*
			Mean±S.D. MEq/ Lit.	*Valid range of distribution*	
1.	Normal controls	10	0.239±0.041	0.174—0.297	
2.	Cases of pulmonary tuberculosis	50			<0.01
	(a) Active disease	40	0.673 ±0.002	0 .667—0 .679	
	(b) Inactive disease	10	0.273 ±0.037	0.162—0.384	

* Using paired 't' test the difference in serum FFA levels between controls and patients with active pulmonary tuberculosis was found to be statistically significant ('P' Value <0.01)

Table 2
Serum free fatty acid levels in patients with active Pulmonary tuberculosis as related to extent of lesion

S. No.	Case	No. of cases	Serum free fatty acid levels	Valid range of distribution mEq/L	'P' Value
			Mean±S.D. mEq/Lit		
1 .	With minimal lesion	13	0.459±0.089	0.292—0.526	
2.	With moderate lesion	15	0.692 ±0.047	0.551—0.773	<0.01
3.	With far-advanced lesion	12	0.852 ±0.028	0.768—0.936	

* Using paired't' test the difference in serum free fatty acid levels between patients with minimal lesion and far-advanced lesion was found to be statistically, significant ('P' Value •< 0.01).

Table 3
Serum free fatty acid levels and sputum positivity (on smear examination)

S. No.	Case	No. of cases	Serum free fatty acid levels		<p. Value
			Mean±S.D. mEq/L.	Valid range of distribution mEq/L	
1.	Sputum Positive	18	0.808±0.070	0.698—0.918	<0.01
2.	Sputum Negative	22	0.540±0.121	0.277—0.803	

* Using paired 't' test the difference was statistically significant ('P' Value <0.01).

Table 4

Serum FFA levels in cases of pulmonary tuberculosis as related to sensitivity to primary antitubercular drugs.

S. No.	Case	No. of cases	Serum FFA Levels		Value
			Mean±S.D. mEq/Lit.	Valid range of distribution	
1.	Sensitive	32	0.802 ±0.082	0.556—1.048	<0.01
2.	Resistant		0.641 ±0.093	0.362—0.920	

* Using paired 't' test the difference was statistically significant ('P' Value <0.01)

Discussion

The tubercle bacillus has a complex biochemical composition and the chronicity of the infection brings about various alterations in the intermediary metabolism of the host. Loss of weight due to reduction in adipose tissue stores is an important feature of the tubercular disease. Increased break-down of adipose tissue with conversion of triglycerides into fatty acids leads to raised levels of serum free fatty acids in patients with pulmonary tuberculosis as observed in the present study. The rise in serum free fatty acids is related to the extent of the lesion and the bacillary status of the patient. Thus in patients with far advanced lesions and lowered immunity highest levels (0.852 ± 0.028 mEq/L) were found as compared to patients with minimal lesion (0.459 ± 0.089 mEq/L). Likewise patients excreting a large number of bacilli in their sputum i.e. with sputum positive for AFB on smear examination had higher levels (0.808± 0.070 mEq/L) of serum free fatty acids as compared to patients with sputum smear negative for AFB (0.540 ±0.121 mEq/L). A decreased peripheral utilization of free fatty acids may also contribute to raised serum levels of free fatty acids because of the inhibition of transcyclase reaction involved in the formation of neutral lipids or phospholipids and to blockade of entry of fatty acids into mitochondria. Thus a combination of various factors e.g. excessive production and decreased peripheral utilization may lead to significantly higher plasma levels of fatty acids as observed in the present study.

It was observed that sensitivity of bacilli to primary antitubercular drugs was related to serum FFA levels. Our findings in the present series showed that serum FFA levels were higher in patients with sensitive bacilli (0.802 mEq/L) while in patients with resistant bacilli, the values were lower (0.641 ± 0.093 mEq/L). The difference in serum FFA levels in cases with sensitive and resistant bacilli may be due to some change in soluble enzyme system in resistant mycobacterium. The soluble enzyme system present in the mycobacterium tuberculosis catalyses the synthesis of fatty acids (Kanamasa, 1965 and Lynnwang, 1970).

It was also observed that serum FFA levels were related to the activity of disease and antitubercular treatment. Thus significantly lowered serum FFA levels were found in treated patients of pulmonary tuberculosis with inactive disease which may be due to lesser number of bacilli expected to be present in them.

The soluble enzyme system in the mycobacterium catalyze the synthesis of fatty acids (Kanamasa and Goldman, 1970; Lynnwang Goldman, 1970) which promote multiplication of mycobacterium by virtue of their influence on the nitrogen metabolism. It is possible, that conditions like diabetes mellitus, starvation, alcoholism and corticosteroid therapy predispose to pulmonary tuberculosis because of an accompanying higher serum free fatty acids. The inhibition of nitrate reductase activity by some of the antitubercular drugs (Hedgecock, 1968) reduces the utilization and synthesis of fatty acids by the mycobacterium and thereby restricts the growth of the pathogens. Tepper (1965) demonstrated that mycobacterium tuberculosis utilizes fatty acids as reserve energy when their growth is inhibited by antitubercular drugs; thus in treated patients plasma free fatty acids approach the control levels. The normalization of fatty acid

metabolism is manifested clinically as weight gain in the patients treated with antitubercular drugs.

Summary

The serum free fatty acids were estimated in 10 controls and 50 patients with pulmonary tuberculosis. The increase in serum free fatty acids was related to the severity and extent of disease, and activity of disease. Sensitivity of bacilli to primary anti-tubercular drugs also seems to be related to serum FFA levels. The rise in serum FFA levels in cases of pulmonary tuberculosis could be due to one or both of the following factors : (a) Increased catabolism of adipose tissue i.e. triglycerides with over production of fatty acids for synthesis of triglycerides.

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A CASE OF CHRONIC DISSEMINATED FOCAL TUBERCULOSIS

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S.B., female Muslim, aged 25 was admitted early in 1973 in Medical Wards of Hospital for Diseases of Chest & T.B. Hyderabad with the following lesions:

1. Bilateral apical fibrotic scarring and a thickened pleural reaction on the left with a direct smear sputum negative but X-ray positive evidence of tuberculosis.

2. Sinuses and puckered scars in right axilla and pectoral region indicating disease of lymph nodes, (fig. 1).

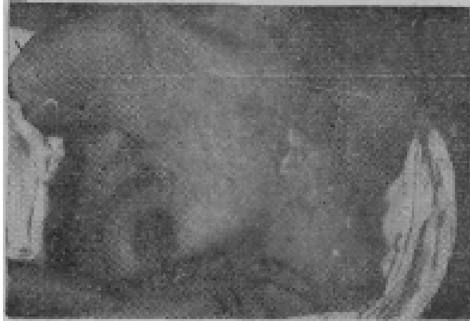

Fig. 1

Depicting sinuses 2, 4, 5, 6 and (f).

3. Sinus in the left inframammary region reminiscent of the old left sided empyaema.

4. Sinus in the suprasternal region contri buted by the cold abscess in lymph nodes (fig. 1).

5. Sinus over the sternum at the junction of the body and manubrium (fig. 1). The manubrium has been eroded in skiagram, though it is thought traditionally uncommon for a flat bone to be involved in tuberculosis.

6. Sinus over the left mammary gland medial to the nipple, tracking from sternum (fig. 1).

7. Sinus left side of chest wall in the paraspinal region evidently having tracked from the left sided empyaema. (fig. 2).

The sinuses described above were reported to have appeared in a span of three months. She received anti-tuberculous treatment with first line drugs. The sputum and pleural aspirate were

Fig. 2
Showing sinuses 7. (c) and (d).

negative for acid fast bacilli. The patient was discharged and continued on a combination of PAS and INH for one year. In December 1973 she was readmitted with

(a) recurrence of sinuses (3) and (4) mention ed above;

(b) sinuses over the dorsum of right foot (tuberculosis of tarsal bones except talus), tuberculosis left ankle joint with swelling and synovial thickening (fig. 3);

Fig. 3.
Demonstrating sinuses right foot and swelling left ankle.

(c) sinus over right sacroiliac region indi cating disease of that joint (fig. 2);

(d) sinus right posterior axillary line over llth and 12th ribs attributed to caries spine (fig. 2);

(e) Caries sicca left shoulder with a sinus;

(f) sinus over the proximal phalanx of right index finger (tuberculous dactylitis) (fig. 1).

Patient was given a triple drug combination of SM, PAS and INH upto 110 days and subsequently PAS and INH till 20.2.1975. Her general condition improved, sinuses partially closed, she was discharged and was continuing PAS and INH.

Patient returned on 21.8.1975 with recurrence of sinuses (3), (4), (b) (c), (d) and (e) and depleted general state of health. Ethambutol was added to the PAS and INH regime on 8.10.1975. Biopsy of granulation tissue from the sinuses on right foot was reported as tuberculous and yielded positive results for AFB, on culture, with the following details about microbiology (Nov '75);

Sensitive to streptomycin, thiacetazone, para aminosalicylic acid, ethionamide, cycloserine and ethambutol.

Resistant to isonicotinic acid hydrazide and pyrazinamide. Catalase, peroxidase and niacin tests positive.

Two weeks after start of therapy the sinuses began regressing and there was evidence of permanent regression of all, by the eleventh week, an experience not encountered hitherto in previous admissions.

Discussion

Interesting points noted in this case were:

(i) Failure to demonstrate bacilli in sputum or secretions from the lesions during the earlier years of evolution in the disease.

(ii) Attempts to demonstrate the bacilli from the osteoarticular foci successful after about three years after appearance of sinuses.

(hi) Partial healing and recurrence in spite of continued use of first line drugs.

(iv) Complete regression of sinuses after instituting a regimen containing ethambutol.

(v) culture reported as sensitive to SM, TBI and PAS with organisms resistant to INH.

(vi) Primary resistant to pyrazinamide.

This disease is comparable to disseminated sclerosis in Neurology wherein the lesions appear scattered in time and space over the cerebrospinal axis. In the case under report they appeared disseminated in different organs at different sites as a sequel to haematogenous spread. The target organs in this case were lungs, pleura and osteoarticular structures.

In chronic disseminated tuberculosis the dissemination takes a protracted course. Pagel (1964) described a case wherein the crop up of the lesions evolved in the course of 10 years starting with laryngitis progressing to wrist joint tuberculosis and lung involvement, epididymitis and a nodule in prostate ultimately ending fatally. The multiplicity, chronicity and protracted course of lesions in this case under report earns the title of chronic disseminated tuberculosis.

Acknowledgements

I owe my thanks to Dr. M. Venkataratnam, Bacteriologist, State TB Centre, Hyderabad for arranging the Microbiology reports.

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PRIMARY GASTRIC TUBERCULOSIS

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A Hindu female aged 35 years was admitted to the hospital with the complaint of epigastria pain and distension after meals for last one year. She had lost a good amount of weight and would vomit once or twice a day. She had malaena twice during this one year. She had never experienced night sweats, cough or pyrexia and there was no known family history of tuberculosis.

Physical examination revealed an emaciated and anaemic woman weighing 35 kgs. who had slight tenderness in the epigastrium. Gastric succesion splash was present. No mass was felt. The liver and spleen were not palpable.

Her Haemoglobin was 8.5 gm. percent, E.S.R. 10 mm/hour and urine and stool examination revealed nothing positive. X-ray chest was normal. Barium meal examination of stomach revealed an evidence of pyloric obstruction. Her augmented histamine test for gastric acidity revealed hypochlorhydria.

A clinical diagnosis of pyloric obstruction due to a gastric neoplasm was made and the patient was explored. At operation, there was an indurated mass in the pyloric region with marked adhesions between the mass and the pancreas, colon and gall bladder. Numerous enlarged lymphnodes were seen along with coeliac plexusis and the greater and lesser curvatures of the stomach. There were enlarged lymphnodes scattered all over the mesentry. The rest of the gut, the liver, pancreas and the spleen were normal. A palliative gastro-enterostomy was done after excising a lymphnode from the greater curvature of the stomach, after having made an operative diagnosis of inoperable gastric carcinoma.

Histopathological examination of the lymphnode revealed tuberculous lymphadenitis.

In view of the histopathological report, the patient was put on anti-tuberculosis chemotherapy. The patient has made a satisfactory improvement with six months therapy.

Discussion

Primary gastric tuberculosis is surpassed in rarity only by a primary lesion of the oesophagus (Page *et al,* 1975). Isolated cases of gastric tuberculosis have been recorded in the Russian (Kuzionov and Polinkova, 1973) and Indian (Bhargava and Sekhon 1973) literature. Stirk (1968) and Page *et al* (1975) have reported the primary tuberculosis of the stomach in the western literature.

According to Palmer (1950) the condition is usually secondary to a pulmonary lesion and he found an incidence of 0.05 per cent involvement of stomach in pulmonary tuberculosis. 56 per cent of the patients with pulmonary tuberculosis have been found to have associated tuberculosis of some part of the gastro intestinal tract (Abrams and Holden, 1964). Novis *et al* (1973) recorded one case out of 59 patients with gastro intestinal tuberculosis to have involved the stomach. In the present case, there was no associated pulmonary or intestinal involvement. Good (1941) did not believe that primary gastric tuberculosis existed, and stated the various factors, which protected the stomach from such an involvement. Kossick (1969) however, suggested that the tubercle bacilli enter via an pre-existing ulcer, to give rise to a lesion in the stomach.

The clinical picture of gastric tuberculosis simulates chronic gastritis, peptic ulcer or carcinoma. Post prandial pain in the abdomen, distension and discomfort, vomiting and loss of weight may be the presenting features of these patients (Hoon *et al,* 1950). In 50 per cent of the cases there is a palpable mass and in about half of these, there is evidence of tuberculosis elsewhere in the body (Chazan and Aitchison, 1960; Gains, 1952). In the case, presented here, both these features were absent.

Abrams and Holden (1964) described haemorrhage, perforation, obstruction and fistula formation as the complications of this lesion. Massive haemorrhage has been reported by Chazan and Aitchison (1960) and Bhargava and Sekhon (1973).

Gastric analysis to differentiate tuberculosis from carcinoma of the stomach has also been of little help. Palmer (1950) reported achlorhydria in 25 per cent and hypochlorhydria in 57 per cent patients. Bhargava and Sekhon (1973) found gastric acidity within normal limits in their cases; we had hypochlorhydria in our patient.

Roentgenographic studies are of little help in arriving at diagnosis (Gaines *et al,* 1952) and there are no characteristic features of gastric tuberculosis (Kanekevich, 1959) and the picture may be similar to that of a gastric neoplasm as was the case in our patient.

Partial gastrectomy followed by antitubercular chemotherapy has been advised as the treatment of choice (Strik, 1968).

Summary

A case of primary gastric tuberculosis is presented in a female patient of 35 years age, in whom a clinical and operative diagnosis of carcinoma stomach was made. A bypass operation followed by antitubercular chemotherapy was followed by a marked improvement.

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LKFROSV IN TUBERCULOSIS

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Introduction

The bacilli of mycobacteria family are the causative agents in both tuberculosis and leprosy. The occurrence of both the diseases in the same person has been reported in India (1) and abroad (3). Most of the case reports from India have been of patients with tuberculoid leprosy who subsequently developed or manifested pulmonary tuberculosis.

The present article describes four cases of pulmonary tuberculosis in whom leprosy was detected subsequently. Such cases have not been reported earlier.

Case Reports

Case No. 1. Male patient aged 50 years was diagnosed to have pulmonary tuberculosis and was started on antituberculous therapy on 17 March 72. Sputum was positive for tubercle bacilli. While undergoing antituberculous therapy, he developed hypopigmented patches in front of the right leg and upper third of the left leg. The hypopigmented patches were also hypoaesthetic. Peroneal nerves and right ulnar nerve were thickened A clinical diagnosis of leprosy was made. Skin biopsy was done in June, 1972. Histopathology was consistent with that of tuberculoid leprosy. No AFB (lepra) were seen. Sulphone therapy was started on 20 June 1972. Patient is doing well thereafter.

*Case No. 2.*26 years old patient was diagnosed to have pulmonary tuberculosis in Feb. 73. Pulmonary lesions were located in both upper lobes and sputum was positive for tubercle bacilli. Antituberculous therapy was started on 22nd Feb. 73. In June 1973, while on antituberculous therapy, a hypopigmented, anesthetic, well denned, infiltrated patch was noticed on the left temporal region. Great auricular nerves were thickened on both sides. Biopsy of the lesion confirmed the diagnosis of tuberculoid leprosy. DOS therapy was started. Patient continues to improve.

Case No. 3. 30 years old male patient was diagnosed clinically, radiologically and bacteriologically as having pulmonary tuberculosis and antituberculous therapy was started on 10 Sep. 74. He had BCG vaccination in 1961. In early Nov. 74, he developed a maculopapular rash on the legs and upper arms. Initially this was thought to be a drug reaction. But on withdrawal of antituberculous therapy, the lesion persisted. Leprosy was therefore suspected. Skin clippings were positive for AFB (lepra). There was also dermatographia. Biopsy of the lesions revealed changes of lepromatous leprosy. DDS therapy was started. At this stage his sputum was also positive for AFB. Rifampicin 600 mg daily was added to the therapy. He showed rapid conversion. Skin clipping became negative for AFB (lepra) within 6 weeks and sputum also became negative. Patient made unevenful recovery.

Case No. 4. Male aged 29 years was admitted for haemoptysis in July, 1974. He was diagnosed clinically and radiologically to have pulmonary tuberculosis and antituberculous therapy was started on 23 Aug 74. Sputum was negative for tubercle bacilli. In early Oct. 74, he developed hypopigmented patches on the dorsum of the left foot. Ulnar nerves and popliteal nerves were thickened. Skin clippings were negative for AFB (lepra). The hypopigmented patches were anesthetic. Biopsy of the lesions confirmed tuberculoid leprosy. DDS were started on 20 Oct. 74. He is doing well.

Discussion

In our cases the clinical detection of leprosy was made while patients were undergoing antituberculous therapy for pulmonary tuberculosis. Two of the patient were vaccinated with BCG, but in other 2 no BCG vaccination was done. In all the four cases, however PPD reaction (1 TU) was positive. Lepromin test was not done in these cases. It is presumed that leprosy manifested clinically while pulmonary tuberculosis was active. Such cases are not reported earlier. This perhaps raises the doubt about the antigenic similarity between the two organiams. Thus BCG vaccination or the active infection of pulmonary tuberculosis, do not seem "to have protected patients from developing leprosy (5). In one patient lepromatous leprosy was detected with skin clippings positive for AFB (lepra). Gujwani *et al* (1968) and Gupta *et al* (1971) also reported association of tuberculoid type of leprosy with tuberculosis. As tuberculoid leprosy is characterized by insideous onset of hypopigmented patches on skin and thickness of nerves, patient usually seeks medical advice quite late. It is emphasised that in Tuberculosis Sanatoria, a periodical careful search should be made to detect leprosy while the patients are on antituberculous

therapy even though the association is not frequent.

Summary

The present article reports four cases of leprosy one lepromatous and three tuberculoid types. In all these cases, the leprosy was detected in confirmed cases of pulmonary tuberculois who were on antituberculous drugs for varying intervals of 8-20 weeks.

It is presumed that leprosy became active and manifest while pulmonary tuberculosis was active and being treated. This perhaps casts doubt about the antigenic similarity between the tubercule and leprosy bacilli. It is emphasised that in a TB Hospital, careful search for detecting leprosy among its patients should be made periodically, even though the association of the two diseases is not very frequent.

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COEXISTING SCLERODERMA AND PULMONARY TUBERCULOSIS

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Scleroderma (Progressive Systemic Sclerosis) is a disease involving the Collagenous Connective tissue which may cause widespread symmetrical, lethargy induration of the skin followed by atrophy and pigmentation. Cutaneous lesions are merely the external manifestations of a systemic disease, and the muscles, bones, mucous membranes, heart, lungs, intestinal tract and other internal organs may be involved by the process resulting in functional impairment such as heart failure or pulmonary insufficiency.

The coexistance of scleroderma and pulmonary tuberculosis is very rare and is being reported.

Case Report :

K.S. 22 years Hindu female (Hosp. No. B3764) was hospitalized on 30.9.74 with complaints of swelling in fingers and toes with ulcers in most of them for 12 years, pigmentation and hardened skin, cough with scanty sputum and exertional dyspnoea for 7 months. There was loss of weight and appetite for the last 6 months, and some difficulty in swallowing solids and retrosternal burning sensation of 5 months' duration. There was no history suggestive of any allergic disorders.

At the age of 9 years patient suffered from high fever, which persisted for about 2-3 weeks. It was diagnosed as enteric and treated with chloramphenicol capsules. She recovered from this illness within 3 weeks, but one month later she developed mild pain over the upper thoracic spine. About a year later she noticed some brownish pigmentation on her face and finger tips. In the following winter pain increased in the finger tips and was controlled by broad spectrum antibiotics. In the next winter there was marked pain and swelling of the finger tips with some discharge of pus. This time she had very little relief with antibiotics. This process gradually continued and by 1968 her skin of the face (especially of forehead) and limbs had become more pigmented and tough. Skin biopsy (Pathology No. 68-47) showed a picture compatible with scleroderma. She was put on Chloroquine tab. (250 mg) twice daily initially and then on maintenance dose of one tablet daily for about a year; but there was no improvement. In the winter of 1973 the finger tips became gangrenous and amputation was advised but the patient did not accept surgery.

Fig. 1

Characteristic facies of Scleroderma: Mask like face, puckered lips, skin hard smooth and glistening with mottled pigmentation.

On physical examination, patient was a thin built female with characteristic facies of scleroderma i.e. mask like face, with puckered lips, tough, smooth and glistening skin with mottled pigmentation. The skin over hands fingers, toes, was also smooth and shiny, and there was pus discharge from some of the fingers. She had difficulty in closing the mouth. She was dyspnoic. Clubbing of the fingers was present. Pulse was 88/mt. and B.P. 112/70mm. of Hg. Examination showed restricted movements and fine crepts at both bases. Ronchi were present at places. Other systems were normal. Cervical and Inguinal lymph nodes were not palpable. Total leucocyte count was 8,600/cu mm of blood with Polys. 62 %, Lymp. 32 %, and Eosinophils 6 %. Haemoglobin was 11.4 gm% and E.S.R. 32 mm. after 1st hour, (Wintobes). Urine analysis and stool was normal. Culture of the urine was also sterile after 48 hours. Sputum was peristently negative for A.F.B. Culture of sputum showed moderate growth of Streptococcus viridens with maximum sensitivity to Ampicillin. Liver biopsy showed peripheral fibrosis. L.E. cells were not seen in the blood. Mantoux test with 1 T.U. P.P.D. was

0 mm. Skiagram chest (fig. II) showed diffuse reticular shadows in all the zones extending from hilum to the periphery, and dilated trachea. Barium swallow did not reveal any dilation or stricture of oesophagus. She was put on oral ampicillin 500 mgm 8 hourly along with corticosteroids 30 mg/day. Cough and dyspnoea disappeared and she ,felt marked improvement. However, discharge from the finger did not subside completely. She was then given 10 injections of Reverin'intraar-terially in each of

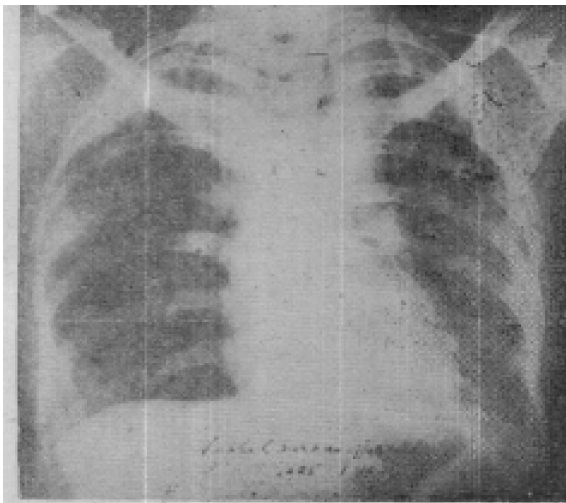

Fig. 2

Showing diffused reticular shadows in all the zones extending from hilum to the periphery, and dilated trachea.

the four limbs. This showed marked improvement and she was discharged from the hospital with the tapering dose of corticosteroids. For six months she remained farily well without any trouble. In the first week of April '75, she again developed high temperature cough with expectoration and dyspnoea. Total leucocyte count was 18000/ cu.mm with Polys. 90% and 10 Lymphocytes. Urine and stool was normal. Examination of the chest showed coarse crepts nearly all over the chest. The sputum was strongly positive for A.F.B. Skiagram of the chest (fig. Ill) showed non-homogenous opacity with break down of lung tissue in right upper and mid zones.

Discussion

Scleroderma was first described by Cur/io in a dissertation delivered in Naples in 1732 and Finlay in 1889 for the first time described lung fibrosis in a case of scleroderma. Pulmonary changes in Scleroderma have been described by

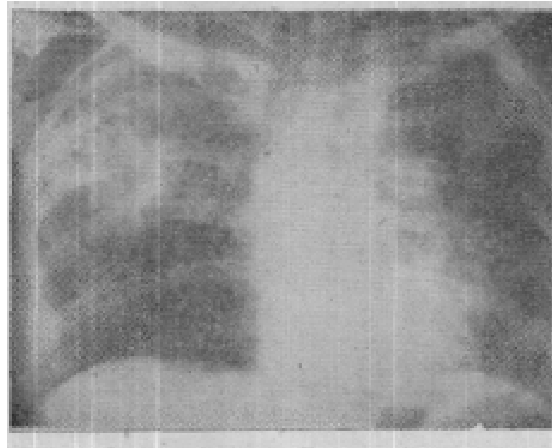

Fig. 3

Showing non-homogeneous opacities with breakdown of lung tissue in right upper and mid zones

Matsui (1924), Goetz (1945) and Spain and Thomas (1950). There is some disagreement as to the frequency of pulmonary involvement but according to Shank at least 30 % of the case show pulmonary lesions. Hayman & Hunt (1952) emphasized that pulmonary manifestations tend to antedate cutaneous findings in some 25% of cases. Other of the most common findings include, acrosclerosis, in turn implying Raymond's Syndrome plus sclerodactylia with the fingers contracted, shortened and some times ulcerated. Calcinosis especially in the extremities about phalangeal joints. All the typical findings were seen in the present cases (Fig. IV). Narang et al (1960) reported a case of scleroderma with cardio-respiratory manifestations, but sclero-

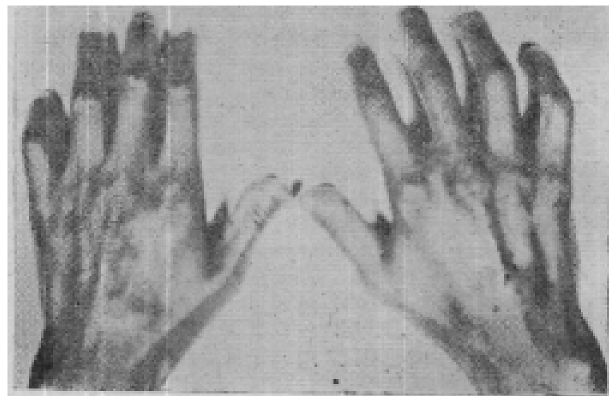

Fig. 4

Osteoporosis and atrophy of terminal phalanges of the hands

derma with pulmonary tuberculosis has not yet been reported to the best of our knowledge.

The specific etiology of the disease is unknown and it may be related to the other major systemic connective tissue disorders, and there may be abnormal immune response concerned in some as yet unidentified way with its pathogenesis. Females are more commonly affected and the disease usually appears in the middle period of life.

Summary

A case of progressive scleroderma with cutaneous involvement, Raynand's Phenomenon, and positive sputum for acid fast bacilli in a Hindu female is reported.

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NEWS & NOTES

ANNUAL, MEETING

The Thirtyeighth Annual General Meeting of the Tuberculosis Association of India was held on 21st April, 1977 at the Conference Hall of the Association. Shri S. Ranganathan, M.P., President of the Association, presided.

AWARDS

The Khushi Ram Shield in recognition of outstanding work in 1976 was awarded to the Tamil Nadu TB Association. Merit Certificates for good work in .1976 were awarded to the Associations of Bengal, Kerala, Karnataka and Madhya Pradesh.

The Seal Trophy for the highest collections made in the 26th Campaign was awarded to the Kerala TB Association and the Runner-up-Cup to the Tamil Nadu TB Association. The Cup for smaller State was awarded to the TB Association of Goa, Daman and Diu. Merit Certificates were awarded to the TB Associations of Delhi, Pondicherry and Tripura for improving their Seal Collections in the 26th Campaign.

SECRETARIES CONFERENCE

The 28th Conference of Secretaries of State TB Associations was held on the 21st April, 1977 in the Conference Hall of the Association. Dr. M.S. Chadha, Vice-Chairman of the Association, presided. The Proceedings of the Conference have been published separately.

TECHNICAL COMMITTEE

Dr. K.V. Krishnaswami, Director, Government Chest Institute and TB Training and Demonstration Centre, Chetput, Madras, was nominated as Chairman of the Technical Committee vice Dr. Tahir Mirza, State TB Officer and Honorary Secretary, TB Association of Jammu & Kashmir, Srinagar, whose term expired after the 31st National Conference. Dr. Krishnaswami will be the President of the 32nd National Conference on TB and Chest Diseases to be held in Trivandrum (Kerala).

The Technical Committee met on 20th April, 1977 and discussed various matters relating to tuberculosis control. It also considered the programme for the 32nd National Conference on TB & Chest Diseases to be held in Trivandrum in November/December 1977.

CONFERENCE PROGRAMME

The Thirtysecond National Conference on Tuberculosis and Chest Diseases will be held in Trivandrum (Kerala) in November/December. 1977. The exact dates will be announced in due course. Subjects selected for discussion at the Conference include (1) Epidemiology of TB in India, (2) Case-Finding (including Urban TB Control Programme), (3) Training Programme, (4) Chemotherapy, including short-term regimens, (5) National TB Control Programme—including the role of TB Associations and other voluntary organisations in the working of the programme, (6) B.C.G. Vaccination — its present position, efficacy and operational aspects, (7) Hypersensitivity diseases of the Lung (8) Immunology of Tuberculosis (9) Tuberculosis in Industry (10) Abdominal Tuberculosis and (11) Surgery in the management of TB.

Those who wish to present papers at the Conference may send in the titles of their papers along with abstracts to the Secretary-General, TB Association of India, 3, Red Cross Road, New Delhi-110 001.

CHANCHAL SINGH MEMORIAL AWARD —1977

The Tuberculosis Association of India will award a cash prize of Rs. 500/- to a Tuberculosis worker preferably below 45 years of age, for an original article on a subject relating to tuberculosis. The article should not exceed 30 double-spaced foolscap typed pages (approximately 6,000 words excluding charts and diagrams). Papers should be sent in quadruplicate, to reach the Tuberculosis Association of India office latest by 31st August, 1977.

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. The subject selected for the 1977 competition is 'Causative Factors in Tuberculosis'. 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-1 not later than 31st August, 1977 and should be forwarded through the Dean or Principal of the College/ University.

HEALTH VISITORS' COURSE

The 1977-78 TB Health Visitors' Course commenced on 1st July, 1977. Twelve candidates have joined the course. The course covers five months training in the New Delhi TB Centre, two weeks in the Lady Reading Health School, New Delhi, two weeks for examination and three months' internship which will last from 1st January to 31st March, 1978 (including two weeks in a rural Centre).

SEMINAR/SHIBIRS

The-TB Association of Orissa held a Seminar at B.M. Swasthya Nibas, Chandpur, in March, 1977. The Director of Health Services and some prominent TB workers in the State participated in the Seminar. The Association proposes to hold similar Seminars in Sambalpur and Berhampur sometime this year.

The Maharashtra State Anti-Tuberculosis Association held their 96th and 97th Anti-TB Shibirs at Shirpur in Dhulia District and Amalner in Jalgaon District on 7th and 8th May, 1977 respectively. As a Pre-Shibir preparation B.C.G. Vaccination drive was undertaken on a house to house basis with the help of Government B.C.G. team from Dhulia. Local volunteers accompanied the B.C.G. team and also made notes of symptomatics and invited them to attend the Shibir. The drive resulted in 6118 B.C.G. Vaccinations in Shirpur and 7924 in Amalner. The Association participated in an Anti-TB Camp arranged at Chemburon 15.5.1977. It wasjointly organised by Chembur Hospital Project Trust. A team of doctors and technicians led by Dr. M.D. Deshmukh carried out work at the Camp. 215 persons were examined and 230 persons were given BCG vaccinations.

SHIBIR CENTENARY

The Shibir centenary function of the Maharashtra State Anti-Tuberculosis Association was held at Dr. Mhaskar Memorial Hospital on Sunday, the 19th June, 1977. Dr. M.M. Wagle presided over the function and Dr. R.Y. Prabhu, Chairman, Health Sub-Committee, Bombay Municipal Corporation, was the Chief Guest. During the Shibir, 678 persons were examined and 95 persons were given BCG vaccination. On this occasion, Dr. Prabhu released the Booklet 'Centenary of Anti-TB Shibirs and Bi-Centenary of Smaller Case Finding B.C.G. Drives'.

KARNATAKA

The Karnataka State TB Association have so far organised 194 Shibirs. In these 1,49,986 were given BCG and 28,336 persons were examined. Of those examined 1,008 were sputum positives and 181 were X-ray positives. Besides 89 BCG camps were held in Bangalore City and surrounding areas in cooperation with the Lady Willington TB Centre during which 13,352 persons were BCG vaccinated. During their house to house survey in Bangalore 38,448 people were contacted and of these 844 symptomatics were found and referred to the Lady Willington TB Centre. The State Association has taken up the survey of Agarbathi Workers in Bangalore while the District TB Association of Mangalore has taken up a survey of Beedi Workers. The Hassan Association has sought the cooperation of Planters for conducting a survey among plantation laborers. Similar surveys are proposed to be conducted in the Districts of Coorg and Chikmagalur.

S.P. PAMRA

Dr. S.P. Pamra, Director, New Delhi TB Centre, has been nominated by the Indian Council of Medical Research to be a member of the Scientific Advisory Committee of the Tuberculosis Chemotherapy Centre.

THIRD EUROPEAN CONGRESS ON CHEST DISEASES

Dr. R. Viswanathan, Chairman, Research Committee of the Tuberculosis Association of India, participated in the Third European Congress on Chest Diseases by invitation. It was held in the Catholic University in Rome from 20-25, June, 1977. Dr. Viswanathan was invited to chair the Session on Tuberculosis and also to speak on 'Short-Term Chemotherapy'. Sixteen papers were read during the Tuberculosis Session. Besides, the TAI Report on Short-Term Chemotherapy presented by Dr. Viswanathan. There was only one paper on Short-Term Chemotherapy from Egypt. There was also another paper regarding 'Alleviating single drug therapy 'for six months only'. The authors claimed good results.

Dr. H.B. Dingley, Medical Superintendent of the L.R.S. TB Hospital, Mehrauli, New Delhi, who had gone to Rome to participate in the First International Carlo-Forlanini Conference, also attended the Third European Congress on Chest Diseases. Dr. Dingley is a member of the Executive Committee of the Carlo-Forlanini Foundation.

EASTERN REGION CONFERENCE

The Eleventh Conference of the Eastern Region of the International Union Against

Tuberculosis will be held in Colombo in 1979 under the joint auspices of the Sri Lanka National Association for the Prevention of Tuberculosis and the Eastern Region of the International Union Against Tuberculosis.

IUAT CONFERENCE

The 24th World Conference on Tuberculosis and its allied meetings under the auspices of the I.U.A.T. will be held in Brussels in 1978. This Conference will be known as "World Conference" of the Union. Its programme will reflect efforts of the Union in the fields of (1) tuberculosis and other microbacterial diseases, particularly leprosy, (2) non-tuberculous respiratory diseases, particularly those of occupational and public health significance, (3) primary health care and action programmes within the framework of social and economic development.

DONATION OF VAN

M/s. G.D. Somani Memorial Trust has donated a Diagnostic Van to the Maharashtra State Anti-TB Association, Bombay. This van is named as 'G.D. Somani Memorial Trust Diagnostic Van'. Sri S.K. Somani presented this Van to the Maharashtra Association on 2nd July, 1977.

B.C. ROY NATIONAL AWARD—1977

Dr. B.C. Roy National Award Fund has decided to give an award in recognition of the best talents in encouraging the development of specialities in different branches of Medicines. They have also decided to give four Awards to Eminent. Medical Teachers in different specialities. Details can te had from the Secretary. Dr. B.C. Roy National Award Fund, Office of the Medical Council of India, Temple Lane, Kotla Road, New Delhi.

CONFERENCE ON ADVANCES IN INTERNAL MEDICINE

The Medical Research Centre of Bombay Hospital Trust will be organizing an International Conference on Advances in Internal Medicine in Bombay from January 10th to 12th, 1978. Details can be obtained from Dr. Surendra J. Mishra, Organising Secretary, Bombay Hospital, Sir Vithaldas Thakaracy Marg, Bombay-400 020.

ACADEMY OF MEDICAL SCIENCES

The Membership Examination of the National Board conducted by the National Academy of Medical Sciences will be held in August, 1977. Only medical graduates are eligible to apply. For details write to Secretary, National Board of Examinations, C-ll/16, Ansari Nagar, New Delhi.

OBITUARY

We regret to announce that Dr. K.G. Menon, a former TB Officer of Tamil Nadu and in that capacity Honorary Secretary of the Tamil Nadu TB Association, passed away in U.S.A. on 19.5.1977. Dr. Menon had gone to New York to see his son and for medical treatment.

CORRECTION

In the paper entitled "Short-term Chemotherapy of Pulmonary Tuberculosis — A controlled trial" by the Research Committee of the Tuberculosis Association of India published in the April 1977 issue of the Journal on p. 57 para 1., the last sentence (Groups B and C are not significantly different from each other but they are both superior to Group A, $P<0.001$) should be corrected to read as follows:

> "Although there is a suggestion that results in Groups B & C are superior to those in Group A, the differences do not attain statistical significance".

The Indian Journal of Tuberculosis

ABSTRACTS

Vol. XXIV July 1977 Abst. No. 3

Short-course chemotherapy in Pulmonary Tuberculosis

A controlled trial by the British Thoracic & Tuberculosis Association. The Lancet; 1976, 11, 1102.

A regimen of Rifampicin plus Isoniazid, supplemented in the first two months by Ethambutol or Streptomycin, was given for six, nine, twelve, or eighteen months in a controlled study of 696 patients with culture-positive pulmonary tuberculosis. The results obtained in the thirty-three months since the start of treatment when all the patients in the six-month and nine-month groups had completed at least two years and those in the twelve-month group had completed twenty-one months of post-chemotherapy follow up revealed no relapses among patients receiving nine months' chemotherapy and 1 % relapse rate in the twelve-month group. The same regimen given for only six months resulted in a relapse rate of 5 % during the subsequent twenty-seven months. All relapses were with fully sensitive bacilli and responded satisfactorily to re-introduction of chemotherapy. Most of the relapses were within the first year of follow up. Many of them had been known to be irregular in taking drugs. In some the drug regimen had to be changed because of adverse reaction to Streptomycin. It is concluded that treatment with Rifampicin plus Isoniazid for nine months, supplemented by Ethambutol in a dose of 25 mg/kg for the first two months, is now acceptable as standard chemotherapy for pulmonary tuberculosis in Britain.

S.P.P.

High-dose Ethambutol : Its role in intermittent chemotherapy.

Richard K. Albert e1 ah, Amer. Rev. Resp. Dis.; 1976, 114, 699.

The results of supervised ambulatory treatment with twice weekly INH and ethambutol are compared with intermittent streptomycin and INH. Both groups had an initial phase of about 12 weeks treatment with INH, streptomycin and ethambutol daily. Nearly 100% sputum conversion was obtained in both groups amongst patients who completed the treatment for about 80 weeks. No relapses were detected amongst these patients during the follow up period upto 2 years. Two interesting observations of this study are:

1. In intermittent treatment an irregularity of upto 15% does not seem to influence the results adversely to any appreciable extent.

2. Use of an injectable medication in the earlier stages of treatment promotes superior clinic attendance.

S.P.P.

The experimental study on the transmission of the anti-tuberculous drugs to fetuses

Mareichi Toyohara. Reports.on Medical Research Problems of Japan Anti-Tuberculosis Association; 1975, 23, 37.

Permeability of the anti-tuberculous drugs through the placenta from mother's body to the fetus was investigated in mice. Placenta barrier was not clearly established in the case of any drug. Rifampicin ws transmitted to the fetus equal to or more than the blood concentration., INH was also transmitted to the fetus but the concentration was lower than blood concentration.

S.P.P.

A study on newly registered tuberculosis patients in Nagano Health Centre area with special reference to the mode of detection

Masanaka Rokusha, Kekkaku; 1976, 51, 441.

The newly registered tuberculous patients in 1972 were analysed in respect of their background factors, severity of disease etc. The proportion of children below 15 years was 29 % which is higher than the national average of 9%. This is due to the fact that many silent primary complexes were counted as active disease, contrary to the practice

adopted in compiling figures for the national average. Only 25% of the lesions were cavitary. Sputum was positivein 24% only—52 % in cavitary cases and 8 % in non-cavitary cases. 26 % of the new cases were found by mass miniature radiographic surveys and 72% through visits to the physicians because of symptoms and 2% by others. In 1969 the mass miniature radiography accounted for 37% of the new cases. The yield of mass miniature radiography was 0.06% in 1971 as against 0.14 % in 1969. 78 % of the new patients had been examined by MMR within the last 3 years. Of these, 67 % were healthy then, 11 % were inactive. Relapses accounted for 24% of the total cases.

S.P.P.

Anti-tuberculous Immunity

Ken-ichi Yamamoto. Kekkaku; 1976, 51, 453.

Intravenous injection of BCG cell wall (CW) attached to minute droplets of light mineral oil and suspended in saline produces pulmonary granuloma in mice that correlated with increased resistance against aerosol challenge with mycobacterium tuberculosis, strain H-37 Rv. Further studies have shown that lung cells from BCG CW-immunized mice showed macrophage migration inhibition activity closely related to protection against aerosol challenge with H-37Rv. Intravenous injection of specific antigen, PPD or BCG into BCG CW-immunized mice one day before aerosol challenge with mycobacterium bovis, strain Ravenel, resulted in increased protection against the aerosol challenge. The author concludes that pulmonary granuloma formation is mediated by cellular immunity. Anti-tuberculous immunity induced by BCG CW in mice is closely associated with pulmonary granuloma which are considered to consist of massive activated macrophages resulting from cell mediated immunity in lung tissue.

S.P.P.

A case of bronchopneumonia caused by inhalation of perchlorpethylene

Tatsuro Twasaki and Kazuro Iwai, Reports on Medical Research Problems of the Japan Anti-Tuberculosis Association; 1975, 23, 46.

A 48 years old female started inhaling perchlorethylene when she started working temporarily in a dry cleaning concern. Four days later she developed cough with purulent sputum. Temperature started rising after another week. Two days later she attended a tuberculosis clinic because of fever, cough and dyspnoea. Skiagram of the chest showed diffused miliary like shadows. Tuberculin test was positive. The sputum was negative for AFB but positive for grampositive cocci. All lung shadows disappeared in 3 weeks time after stopping the work. Patch test using an ointment containing Perchlorethylene showed erythema of 13 mm 5 hours after its application. In experiments on mice, all animals died 2 to 3 days after the daily inhalation of Perchlorethylene with 1,000 ppm for 3 hours per day due to pulmonary bleeding and bronchial pneumonia. Animal experiments tend to confirm further that Perchlorethylene was the cause for bronchopneumonia in the reported case.

S.P.P.

Statistical and pathological observations on autopsy cases of sarcoidosis

Kazuro Iwai et al, Reports on Medical Research Problems of the Japan Anti-Tuberculosis Association; 1975; 23, 43.

Seventy seven autopsies proved to be sarcoidosis during 12 years from 1961 to 1972 have been statistically analysed. Thirteen of these belonged to the so-called giant cell myocarditis and 3 had insufficient evidence of sarcoidosis. The average number of cases is 4.2 per year. Death from sarcoidosis occurs often in females over 40 years of age, the age range being 17 to 83 years. The most frequent cause of death amongst sarcoidosis patients was myocardial sarcoidosis 32 cases, pulmonary sarcoidosis 5 cases and brain sarcoidosis 4 cases. Fifteen sarcoidosis patients died of non-sarcoidosis diseases such as cardiovascular disease, infection etc. Period between disease and death was shortest (2.3 years) in myocardial sarcoidosis and longest (10.4 years) in pulmonary sarcoidosis. In brain sarcoidosis it was 5.9 years. Clinical diagnosis of sarcoidosis was made in 12.5% only of the cases which died of myocardial sarcoidosis. Histological examination revealed that the lung was the most highly affected organ as well as the hilar and mediastinal lymph nodes. Next in frequency were liver and spleen. Myocardium was involved in about 30%. Progression of the disease may occur either through new dissemination of granulomas or through local continuous spread.

S.P.P.

Effect of wool dust on respiratory function

E. Zuskin, F. Valic and Bouhuys. Amer. Rev. Resp.Dis.; 1976, 114, 705.

A group of 252 workers (176 women and 76 men) employed in two woollen mills was studied.

The mean age was 36 years and mean exposure 11 years. All women were non-smokers but 47% of the men were regular smokers. Workers exposed to wool dust for more than 10 years had a higher prevalence of chronic respiratory symptoms but the difference was not significant. They however had significantly lower than predicted pre-shift values for maximal expiratory flow rates at 50% of the control vital capacity. Comparison with the same concentration and exposure of cotton dust revealed a similar effect during the first 40 minutes after exposure but a significantly larger effect of the cotton dust after 40 minutes.

S.P.P.

Idiopathic pulmonary haemosiderosis. Evidence of capillary basement membrane abnormality

F. Gonzalez-crussi, Meredith T. Hull and Jay L. Grosfelt. Amer. Rev. Resp. Dis.; 1976, 114, 689.

A two year old black female child was admitted to a hospital for iron deficiency anemia with fever, cough. Skiagram of the chest showed bilateral pulmonary infiltration, consistent with haemosiderosis. Lung biopsy specimen showed the presence of masses of haemosiderin—containing macrophages free in the alveolar spaces. Well preserved red cells were found in the alveolar spaces and interstitial tissues suggesting old and recent haemorrhage. The alveolar septa were moderately thick, owing to the presence of blood cells, prominent mesenchymal septal cells, fibrin deposits, and light-staining zones suggestive of oedema. Electron microscopic examination of biopsy material disclosed prominent changes in the basement membrane of alveolar capillaries which was probably the cause of haemorrhage rather than structural defects in capillary walls incriminated hitherto on theoretical grounds.

S.P.P.

Acute Coccidioidal Pleural Effusion

Stewart A. Lonky et al, Amer. Rev. Resp. Dis.; 1976, 114, 681.

Twenty eight patients with a diagnosis of coccidioidomycosis from 1970 to 1974 were found to have a pleural effusion. The effusion appeared to be secondary as a result of direct spread from lung parenchyrrial lesions present simultaneously in 26 of these. In the remaining 2, the route of infection appeared to be haematogenous since disseminated lesions were present elsewhere. One of them was a two year old Phillipino boy who presented at the hospital with pleural effusion and meningitis. The second was a 72 year old insulin-dependent diabetic black man who had involvement of pleura, skin, synovia and meninges. Both these patients possessed factors known to pre-dispose to dissemination and died within 72 hours of diagnosis and start of treatment.

The diagnosis was based on skin test with coccidioidin, peripheral eosinophilia, examination of sputum and pleural effusion for the presence of fungus by direct smear and/or culture, pleural biopsy and complement fixation test. Culture of pleural biopsy specimen was positive in all the 8 cases where biopsy was done. Treatment with Amphotericin B was sucessful in 26 patients.

S.P.P.

Value of Lactic Dehydrogenase in Cerebrospinal fluid of Tuberculous Meningitis Patients

S.K. Khanna et al. Journal of Indian Medical Association; 1977, 68, 4.

Lactic Dehydrogenase (LDH) value in the cerebrospinal fluid (CSF) was estimated in 20 cases of tuberculous meningitis diagnosed mainly on clinical and biochemical findings and in 10 controls. In controls the LDH activity was found to be between 0 and 35 units per ml. In tuberculous meningitis patients, an increase in LDH activity was noticed in all cases, the range being 80 to 265 units per ml. The activity was higher in patients who were seriously ill and/or had an acute onset. There was however no correlation between the increase in CSF-LDH activity and biochemical findings. Estimation of CSF-LDH activity may thus help in the diagnosis of doubtful cases where biochemical and other features are equivocal. It was also seen that the LDH level dropped fairly faster than the improvement in biochemical findings as a result of successful treatment and, therefore, repeated LDH estimations during the course of treatment may provide useful index for estimation of the efficacy of treatment and prognosis of the patient.

S.P.P.

Post-operative impairment of mucous transport in the lung

Gordon Gamsu et al. Amer. Rev. Resp. Dis.; 1976, 114, 673.

Impairment of mucous transport is considered significant to the postoperative development of atelectasis but the association had so far never been demonstrated in humans. Tantalum powder, which adheres to airway mucous, can be used to study mucociliary transport. The postoperative

clearance of insufflated tantalum powder (mean diameter, 2.5 μ.*m)* was investigated in 25 patients. Eighteen patients underwent intra-abdominal vascular surgery and 7 underwent lower-extremity orthopedic procedures. At the completion of surgery, tantalum was insufflated into both lungs of each patient to outline a representative sample of airways from the trachea to the small bronchi.

Tantalum clearance was evaluated from serial radiographs obtained immediately after insufflation and at approximately 6, 18, 26 and 48 hours later, and thereafter whenever appropriate. In the 7 orthopedic patients, clearance of tantalum was progressive and usually complete within 48 hours. Atelectasis did not occur in this group. In 14 of the 18 patients who had abdominal surgery, mucociliary clearance was markedly abnormal in that tantalum was retained for upto 6 days. Pooling of tantalum-labelled mucus occurred in dependent bronchi in 16 of these 18 patients. Pooling preceded and always accompanied radiographically visible Atelectasis' Lobar atelectasis occurred in 6 patients and segmental atelectasis in 8. Tantalum-labelled mucus moved peripherally in atelectatic lobes or segments and was retained in these bronchi until re-expansion took place. Thus impaired ciliary function and mucous transport are associated with and implicated in postoperative pulmonary atelectasis.

S.P.P.

Liver in Childhood Tuberculosis
(A clinical hisiopathological study)

K.C. Praharey and Upendra Chaudhury: Ind. Pcd. Vol. IV. No. 3, 1977.

35 patients of childhood tuberculosis with hepatomegaly" were studied clinically and histbpathologically. Most of the children were with primary complex. Histopathologically granulomas were not detected and nine had normal histology. Non-specific changes like Kupffer cell hyperplasia, round cell infiltration, fibroses and fatty changes were seen in 26 cases.

H.B.D.

A study of tuberculin test in pediatric practice

S.L. Mittel and N.R. Bhandari, Ind. Jour. Fed. Vol. XIV, No. 3, 1977.

Mantoux test with I.TU, P.P.D. was done in 1920 children between the age of 6 months to 12 years selected at random. 9.11 percent had a reaction of 10 m.m. or more. This percentage is higher in the age group 7-8 years (20.72 %). 48 % of positive reactors had malnutrition. Low socio-economic status, over crowding and anaemia were important contributory factors in positive reactors. Incidence of positive reaction in B.C.G. vaccinated children was 8.19 %. Tuberculin conversion rate was 16.6% in B.C.G. vaccinated children in 6 months to 3 years age group and 8.69 % in 3 to 6 years age. Mantoux test with I.TU strength is not a very reliable diagnostic criterion of detecting tuberculosis in children. It was positive in only a small percentage of B.C.G. vaccinated children.

H.B.D.

On the recent cases of middle lobe syndroms

Kiyoshi Konno Masa Kichi Matomiya, Tadao Ishlkawa and Noboru Asoo. Sci. Rep. Res. lust. Toboku Univ-C, Vol. 23 Ato. 1-4, 1976.

2,545 patients admitted with pulmonary disease between January 1969 and June 1975 showed middle lobe syndrome in 64. Of these, 42 (62 %) were inflammatory (acute or chronic), 13 (20%) due to neoplasm, 7(11%) were tuberculous, 1 was due to kerosene aspiration and in 1 the cause was unknown.

Of the 13 patients due to neoplasm, average age was 50 years. 7 patients were of adneocarcinoma, 3 epidermoid carcinoma, one each metastatic carcinoma, benign hemangioma and one of unknown type.

H.B.D.