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NEWS & NOTES

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CONFERENCES

Conference is an important component of continuing education. It gives an opportunity to workers to report on any special study or observation that they may have made and which would be interesting and/or educative to others. It enables one to know the man behind the work, his difficulties, compulsions, etc. which one cannot get from the report of the work in cold print. It is also an excellent forum for sharing experiences and exchanging thoughts with contemporaries and seniors. Apart from these academic gains, a conference also provides an outing, a relaxation and a social get-together.

Not long ago, the Conferences were few and far between. Today there is a plethora. There is an annual conference in all disciplines of medicine, both clinical and non-clinical at national and state levels. Sometimes there are conferences even at divisional or district levels. Then there are international conferences on practically all subjects, both regional as well as a World Congress. To these may also be added the many symposia, seminars, workshops, etc. which in a way are really mini-conferences organised by medical colleges, research institutions, pharmaceutical concerns etc. There are many persons who are almost always on the move, from one conference to another, leaving little time for their regular work and vocation. Is it good? Are all such conferences really necessary?

There is another aspect of these conferences. The number of studies which add to the existing knowledge or are extra-ordinary and worth presenting at a conference are not many, more so in developing countries with very limited resources. Since papers must be presented at all conferences, it virtually means that many papers are presented over and over again in different conferences. So much so that sometimes one has to listen to the same paper twice or thrice during a year. Does repetition of even an outstanding contribution add much to the scientific dividends of a conference, when usually these have already been published in some journal also?

Still another aspect of conferences is the financial aspect. All those who have hosted a conference recently as well as a decade or two earlier would testify to the tremendously increased expenditure on organising a conference. The standards of hospitality, accommodation, amenities, scientific and otherwise are consistently going up. Each one wants to do better than the one previous. The registration fees have escalated tremendously. But whatever be the quantum of registration fee, it can never cover the entire expenses of a conference. And, therefore, it has necessarily to be subsidised by the government or pharmaceutical industry or donors. And whatever support they extend to a conference in specialty A will also have to be extended to the conference in

specialty B. Will all these sources continue to subsidise for long the conferences which are increasing in number and cost as time goes by?

A time has already come when few amongst us can afford to attend a conference at one's own cost. On the other hand, there is an increasing tendency on the part of the employers, both governmental and non-governmental, to depute only those persons for a conference who have to present a paper. Will it be worthwhile to hold a conference if only those who are to present a paper attend it since their number is not likely to be large in a two or three day conference and a conference lasting more than 3 or 4 days is virtually impossible for reasons more than one?

Many questions arise. Are conferences in such large numbers necessary? Will the object of the conferences be defeated if their number is restricted? For example, if the National Conference on Tuberculosis and Chest Diseases is held in alternate years and in the intervening year conferences are held at State level, would it in any way be detrimental to the objective? One may even go a little further. Instead of each State organising its own conference in alternate years, if three or four States could come together and hold a regional conference by rotation in each state, there will be considerable saving in cost without any reduction in scientific gains? Probably, the academic contents will even improve as the conference will draw on the talents of 3 or 4 states instead of depending on its own. And if such a course is adopted, the money saved thereby can be diverted towards meeting other even more pressing needs of medical and social relief.

Does the prestige of a conference depend merely on its venue? Is a Conference organised in a 4 or 5 star hotel in any way more educative or informative than a conference organised in the unpretentious lecture hall of a college or any other public institution or organization? Will it detract from the success of a conference if much of the lavishness is replaced by some austerity? If the prime object of a conference is education and scientific advancement will severe pruning of the appurtenances reduce its appeal or attendance in any way?

These are some of the questions which everyone must seriously think about. Matters are likely to come to a head sooner than later if the trends of the last few years are allowed to continue unchecked. It is time that we consider these issues thoroughly but dispassionately and take rational decisions in keeping with our resources while retaining the academic benefits conferred by these conferences.

“OUTLOOK FOR TUBERCULOSIS CONTROL 2000 A.D.”

K.N. RAO*

I consider it a great honour to have been invited by the Tuberculosis Association of India to deliver the second Robert Koch-Ranbaxy Oration instituted so generously by Sri Bhai Mohan Singh, the well known pharmaceutical industrialist, at this National Conference on Tuberculosis and Diseases of Chest. I thank them for their kindness.

2. Background

Robert Koch's epoch-making discovery of the tubercle bacillus in 1882, changed the outlook for the control of tuberculosis until the discovery of Streptomycin in 1944. In his programme for combating tuberculosis he recommended prevention of infection by isolation of the patient in hospitals, screening of the patient at home, disinfection of the patient's excretions. He further recommended the organisation of dispensaries, health education of the population, particularly that of the patients' and their families, and compulsory registration of all cases. Even in his time, the incidence of tuberculosis was declining in Europe with improvement in the socio-economic conditions of the people and the introduction of health insurance and social security for industrial workers. In 1887, Sir Robert Philip in line with Koch's ideas established the first anti-tuberculosis dispensary which was the forerunner of the network of modern specialised anti-tuberculosis services and dispensaries in the system of primary health care. The International Union Against Tuberculosis which imposed an obligation on members was born on Oct. 17, 1920 in succession to the Central Bureau for the Prevention of Tuberculosis. The developing countries for want of resources, men, money and materials had very meagre control measures. Towards the end of the Second World War, the work of UNRRA and voluntary organisations through the International Tuberculosis Campaign, was commendable. The discovery of other drugs—INH, PAS, Thiacetazone, Rifampicin, Ethambutol, Pyrazinamide, etc. widened the scope of tuberculosis control/eradication as a realizable goal in some countries. The establishment of the World Health Organisa-

tion in 1948 stepped up global tuberculosis control measures with the support of UNICEF viz BCG Vaccination; Chemotherapy; Research etc. In developed countries these measures were in addition to the socio-economic and welfare measures such as nutrition, housing, environment, social security, health insurance and health laws. The developing countries under the guidance of WHO and IUAT took up anti-tuberculosis measures within their resources to cover the entire population—• prevention by mass BCG Vaccination programme, early detection of cases and domiciliary chemotherapy (as recommended by the Tuberculosis Chemotherapy Centre, Madras), organisation of tuberculosis demonstration & control centres, rehabilitation, research, etc.

The 8th Expert Committee of W.H.O. (1964) standardised the Indian programme approach for all developing countries. The District Tuberculosis Control Programme through the existing health facilities is the keystone of the programme. This was later streamlined, in the light of experience by the 9th Expert Committee in 1974. However, in majority of the developing countries there has been no improvement in the epidemiological situation. As a result of the increase of population and a stagnant socio-economic and nutrition situation, there is an absolute increase in the number of Tuberculosis cases in these countries during the last three decades.

3. Situation Analysis at Present

Tuberculosis is one of the leading health problems in South East Asia today. Sixty five percent of this region's population of one billion live in India. At present the SEA Region has over ten million estimated cases of which four million are sputum positive.

The joint WHO/IUAT study group surveyed the global situation in 1982 and considered it a scandal that 4 million new highly infectious cases appear each year and a similar number of non-infectious cases of tuberculosis, particularly in children, also occur. At any given moment, the total number of cases

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Based on the Robert Koch-Ranbaxy Oration delivered at the 38th National Conference on TB & Chest Diseases, Panaji, Goa.

is of the order of 15 or 20 million out of which 10 million expectorate and about three million people die of Tuberculosis every year. This is considered a paradox in that we have efficient means of prevention, case-finding and complete cure. It is also a dilemma in that financial, organisational, and the human factors constitute obstacles to the full application of available knowledge.

The main obstacles to the present National Programme which require improvement include the following :

- 1) The Ministry of Health requires strong central technical support to guide and supervise the N.T.P. There is need for improving the managerial team at the State and intermediate levels. The programme specialists should consider themselves as specialised technical support to the General Health Administration. The teams should serve not only as specific programme specialists but must also influence the functioning of the whole health system ;
- 2) the process of integration has not been properly appreciated by all the members of the Health Services as there is split responsibility;
- 3) the peripheral health services are inadequate to meet the requirements of the total population;
- 4) lack of funds restricts all health activities including tuberculosis control measures;
- 5) lack of continuous supply of drugs;
- 6) lack of training of key medical staff;
- 7) lack of continuous evaluation;
- 8) lack of community involvement;
- 9) lack of health services research in to the problem of programme delivery; and
- 10) lack of constant review of any variation in the programme

In addition, lack of good health behaviour of people, frequent transfer of staff and insufficient salaries to them make the situation worse.

The WHO/IUAT study group (1981) meeting which was considered as the meeting of the century, laid emphasis on socio-economic measures in addition to BCG vaccination for children, case-finding and chemotherapy, etc.

and recommended integration of tuberculosis control measures in the Primary Health Care approach for the attainment of the goals of tuberculosis control and health for all by 2000 A.D. In the field of Research in tuberculosis, Immunology, Bacteriology, Short-term Chemotherapy, Epidemiology, and Economics of Tuberculosis Control Programme were highlighted.

Primary Health Care: the Need

Primary health Care includes eight vital elements: health education; food and nutrition; provision of safe drinking water and sanitation; maternal and child health and family planning; immunization; prevention and control of endemic diseases, appropriate treatment for common diseases and injuries, the provision of essential drugs, the organisation of an efficient referral system both institutional and laboratory services and evaluation.

Dr. Mahler, in his address at the World Conference on Tuberculosis and Chest Diseases 1982, summarised that the future of tuberculosis lies with Primary Health Care and Health for All by 2000 A.D. 'Health for All' means that there is an equitable distribution among the population, of whatever health resources are available, so that people will use the available approaches for better health care and that health begins at home, in the schools, in the factories and in the fields. He also affirmed that primary health care should be accessible to all with community participation, and that people will help themselves with their own health development. Dr. Mahler further stressed the need for the New International Social and Health order. Lastly he implored that the tuberculosis control programme be seen as a stone in the construction of the health system built upon Health for All and PRIMARY Health Care; and that it is not for the stone to decide its place but for the builder who selected it. There is no doubt that all Tuberculosis workers agree with the above assessment and will help in this great adventure.

As the socio-economic conditions of the people in the developing countries continue to be stagnant, the quality of life as determined by P.Q.L.I. (Physical Quality of Life Index based on Literacy %, infant mortality rate and expectation of life of the people) is below the average 55 when compared to developed and middle income countries (Table I)

P.Q.L.I. component indicators, per capita State domestic product and calories intake for Indian States (1971) with International comparison are shown in Table II and the rural

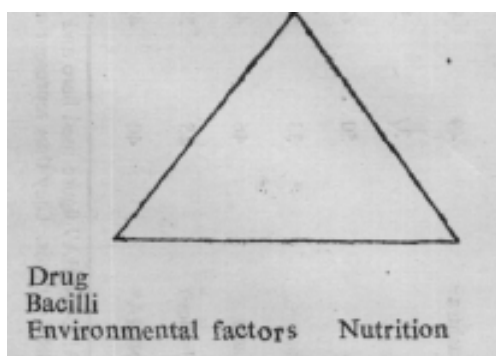
TABLE 1

Average Per Capita GNP and PQLI for 150 Countries by Income Groups, Early 1970s (Weighted by Population)

	Total Population (Millions)	Per capita GNP (\$)	PQLI
Low-income countries (N=42) (Per capita GNP under \$300)	1,242	155	40
Lower middle-income countries (N=38) (Per capita GNP \$300— 699)	1,081	340	67
Upper middle-income countries (N=32) (Per capita GNP \$700-\$1,999)	417	1047	68
High-income countries (N=38) (Per capita GNP \$2,000 and over)	1,040	4,404	92
All countries (N=150)	3,781	1,476	65

& urban P.Q.L.I. for States in India in Table III

The urban/rural differences in the quality of life of the people in India in different states indicate that there is need for emphasis on socio-economic and nutritional factors along with chemotherapy. There is enough literature on the importance of nutrition in the development of resistance to infection and the synergism between mal-nutrition and infections (including tuberculosis). Since the advent of chemotherapy in Tuberculosis in 1944, so far the emphasis has been on the drug, and the causative organism without sufficient consideration to the other factors such as environment and Nutrition. Fig1.



The tragedy, the scandal, the paradox and the dilemma described earlier are the result of our euphoria when chemotherapy was introduced. Anti-bacterial therapy has its limitations.

Mortality has been reduced but morbidity continues and the environmental factors remain unchanged. The defaulters, relapses, occurrence of new cases are indicative of the presence of other factors. Thus tuberculosis prevalence and incidence in any country serve as indices of the social organisation in the countries. The greater prevalence of the disease in the lower socio-economic classes indicates the importance of socio-economic factors. In contrast to the other developing countries, China gives a different picture.

China concentrated on four key issues: China's three level health care net work; the involvement of the people, the health man power development and the financing of health care through Health Cooperatives. China's tremendous political commitment to the task of improving the quality of life of the people, especially in the rural sector, may be well worth emulation by the other developing countries.

While each country differs from others in its historical, cultural, social, economic and political background and circumstances, the health care system in China presents many useful points of reference for those seeking primary health care in other settings. Even with limited resources, primary health care can be established and Tuberculosis Control measures integrated. Political will, people's participation, expansion of health services for primary health care, provision of uninterrupted drug supplies and continuous evaluation seem to be the secret of success of the programme.

TABLE 2.

PQLI Component Indicators, Per Capita State Domestic Product, and Calorie Intake for Indian States, 1971, with International Comparisons

STATE	Indexes of				Actual				
	PQLI	Life Expectancy	Infant mortality rate	Literacy	Life expectancy (1970-71)	Infant mortality day 1000 live	SDP per capita (Rs.) 1972-73 birth	Calorie intake per (Years)	Nations with same PQLI rate (per average)
	1	2	3	4	5	6	7	8	9
1. Andhra Pradesh	43	47.7	54.1	28.2	56.1	109	303.7	2040	Egypt, Iran, Bolivia.
2. Assam/Meghalaya	37	34.1	41.4	36.0	51.3	137	275.0	—	Haiti, Papua New Guinea, Pakistan.
3. Gujarat	40	39.5	38.3	42.1	53.4	144	395.7	1612	Uganda, Morocco
4. Karnataka	48	46.9	61.3	35.8	56.3	93	300.3	2220	Indonesia, Lesotho
5. Kerala	70	63.6	77.0	69.3	62.8	58	302.0	1842	People's Rep. of China, Columbia.
6. Madhya Pradesh	37	45.9	37.8	26.6	55.9	145	262.3	2779	Haiti, Pakistan.
7. Maharashtra	49	46.4	55.0	44.8	56.1	107	422.7	2281	Indonesia, Honduras
8. Orissa	37	37.4	42.8	31.1	52.6	134	254.3	—	Haiti, Pakistan.
9. Punjab	50	67.4	52.7	28.8	64.3	112	473.3	2832	Botswana, Burma
10. Rajasthan	33	32.1	45.9	21.9	50.5	127	310.0	2044	Zaire, People's Rep. of Yemen
11. Tamilnadu	46	43.1	51.8	42.8	54.8	114	355.7	1498	Iraq, Rhodesia, Tunisia
12. Uttar Pradesh	25	27.9	21.2	24.6	48.9	182	260.7	2307	Senegal, Nigeria, Nepal.
ALL INDIA*	40	42.6	42.8	34.1	54.6	134	349.3	1985	

The "ALL-INDIA" figure used here and in other tables that follow are weighted averages for all states and union territories except as noted in the appropriate Census or SRS sources. They thus represent a wider coverage than the 12-state averages otherwise used.

TABLE 3.

Rural and Urban PQLI for States, 1971

STATE	PQLI		Difference	Urban as per cent of total state population
	Urban	Rural		
1. Andhra Pradesh	62	39	23	19.3
2. Assam/Meghalaya	64	35	29	8.9
3. Gujarat	55	34	21	28.1
4. Karnataka	65	43	22	24.3
5. Kerala	74	69	5	16.2
6. Madhya Pradesh	60	32	28	16.3
7. Maharashtra	62	42	20	31.2
8. Orissa	59	35	24	8.4
9. Punjab	65	48	17	23.7
10. Rajasthan	58	28	30	17.6
11. Tamilnadu	64	39	25	30.3
12. Uttar Pradesh	49	21	28	14.0
AVERAGE (Unweighted)	61	39	23	—
ALL-INDIA ⁸	61	35	26	19.9

^aWeighted average for all states and union territories except as noted in appropriate Census and SRS sources.

4. Outlook

Population, Food Environment

The world is faced with population explosion, food scarcity, and environmental pollution. All these will effect the tuberculosis control programme even as poverty, ignorance and war. Non-specific measures in these areas are vital for the conquest of tuberculosis in developing countries.

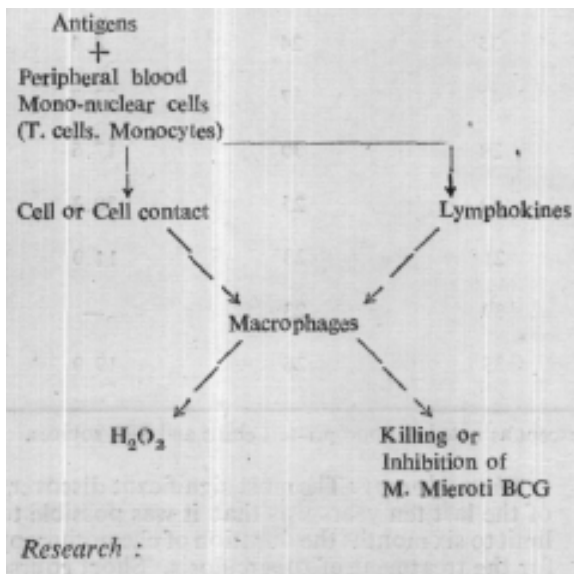
The outlook for tuberculosis control by 2000 A.D. is equally applicable to other Mycobacterial diseases of whom leprosy is another, the causative organism of which was discovered in 1871 by Hansen earlier than the tubercle bacillus. The world geography of both these diseases is similar. However, the outlook is determined by the advances made in chemotherapy, immunology and new techniques in BCG vaccination.

Chemotherapy: The most significant discovery of the last ten years was that it was possible to limit to six months the duration of chemotherapy for the treatment of tuberculosis. Short course regimens have been proved to be extremely effective. The need for an effective organisation and adequate supplies of anti-tuberculosis drugs require no emphasis. The establishment of a foundation (International fund) to ensure an uninterrupted supply of essential anti-tuberculosis drugs as recommended in the Report of the WHO/IUAT is the need of all developing countries. The manufacture of six drugs - Isoniazid, Rifampicin, Pyrazinamide, Streptomycin, Thiacetazone, and Ethambutol in the developing countries regionally or nationally becomes imperative for improving the outlook for tuberculosis control by 2000 A.D.

Developments in immunology of tuberculosis and related disease are taking place very rapidly. It has been said that greater understanding of

the disease process will be made in this decade than in the hundred years since Robert Koch discovered the tubercle bacilli. Tuberculosis immunity is cell mediated. T. Lymphocytes which react directly and specifically to antigens are responsible for the cell mediated immunologic phenomenon. T. cells do not themselves effect the cell mediated antibacterial immunities but act indirectly through hormones — Lymphokines that they secrete. These lymphokines have no immunological properties. They in turn act through macrophages which are attracted to the site of the lesion/bacilli and activate them to kill the bacilli and ingest these (see fig 2) is a virgin field production of Lymphokines or anything stimulate their production will help. Much was expected of Levamisole. Mew developments in this area are envisaged.

Fig. 1 Simple Model* of cell mediated immunity in Tuberculosis.



The areas of immunization, Immunology, studies in geo-bacteriology of the Tubercle Bacillus, case-finding and treatment, particularly short term chemotherapy, discovery of new anti-tuberculosis drugs, epidemiology and sociology of tuberculosis require attention. The progress

made in other related areas will no doubt change the outlook.

The developing countries should encourage research in health education, economics of tuberculosis control programmes particularly in the integration of tuberculosis control measures in Primary Health. Care Health Services Research/Operational Research is of paramount importance and more so as the year 2000 A.D. is near. Can Indian workers make a contribution towards this end? Yes, they can, if there is a will at all levels.

The once high hopes for the speedy conquest of tuberculosis like those for malaria eradication have faded before the complexities of applying available control technology, in developing countries. The governments of developing countries deplored the fact that little improvement had been achieved during the past two decades. The Resolution of the World Health Assembly WHO:36:30 (Annex) expresses succinctly the present outlook and the need for concerted action.

5. Conclusion

The health of mankind requires the cooperation of the government, the people, the health professions and the voluntary organisations like the IUAT and its affiliates in the achievement of our goals through PRIMARY HEALTH CARE. The Tuberculosis Association of India should spearhead the fight against Tuberculosis through PRIMARY HEALTH CARE. AND HFA by 2000 A.D.

It has now been realised that socio-economic factors, standards of living and nutrition enhance resistance to infections. As one approaches 2000 A.D., along with new knowledge there is also the fear of nuclear war, the building up of armaments and the spending of resources for the extinction of the human species. Economic development based on the principles of the New International Economic Order is paramount for the conquest of Tuberculosis. In the meantime* "So tell Pasteur and Koch or whoever they be, That they have not seen the last of my comrades and me."

*"For Tubercle Bacillus" by James Hurd Keeling (1831-1909) From the Song of the Squirt—a satire on Koch's Tuberculin,

CHEST DISEASES IN INDUSTRY

P.A. DESHMUKH

I am extremely grateful to the Executive Committee of the Tuberculosis Association of India for selecting me for this year's Wander F.A.I. Oration. I consider it an honour. I would also like to express my deep sense of appreciation to the House of Wanders for their noteworthy contribution to the advancement of medical science.

Early man lead a nomadic life. His day used to be spent in hunting and fishing—arranging food for his family. In searching for game and green pastures for his herd of animals he wandered from place to place. Seriously ill and very weak persons could not stand the rigours of hard nomadic life. Survival of the fittest was the rule. Air was clean and forests abundant. Man needed tools for his hunting and weapons for defending himself. These were made of stone, then bronze and then iron was used.

As time passed, farming and housing were developed. Man started leading a community life and then he started discovering ways and means to make his life easier—more comfortable, more enjoyable.

It was noted that some rocks contained substances which were of much utility. Mining was started. As the superficial supply started dwindling man started going deeper in the soil. Proccossess were established to obtain a refined product from the rocks which had to be crushed, washed and powdered. And in this process working persons had to breathe air containing dust.

Turning back the pages of history, it is seen that the concept of occupational health is not a new one. It had its inception antiquity. As early as 5th century B.C., Hippocrates mentioned about the breathing difficulty of rock miners.

Ancient citizens who were carrying a mechanical trade had a social stigma. Socrates is said to have stated that persons who were in mechanical trade were dishonoured citizens ^ as these trades damaged the bodies of the workers and that they had no time to perform the duties of friendship and citizenship. Thus, the working man was neglected in ancient

medical practice. It was only in the 18th Century that Ramazzini (1713), the father of Occupational Medicine stressed the importance of study of working environment and its impact on the human body.

With the development of science and technology, new products for use in homes, transportation, farming etc were developed. Newer industries were established. With the creation of new industries, working force, mainly from villages started coming in urban areas. People uprooted themselves from village life and started settling at new industrial sites in urban areas. In the beginning, they had to face acute problems of housing and adjusting to new environment. Housing shortage led to breeding of slums in urban areas. Industries added air pollution. In the developing nations, industries develop in a haphazard manner initially. They are established without proper thought to their location, direction of wind, disposal of effluent. Developing nations want to industrialise fast and in the process, the rules and regulations about proper development are ignored. It is only when industries get established and start paying back that roads, water supply, housing and medical facilities are developed.

On the other hand, the industrial processes themselves are in some respect a hazard to human body. Today, I am devoting my talk to diseases of the Lung in industrial environment. While it may not be possible to include each and every disease of the chest in industrial environment, I will deal with the principal diseases that one comes across in Industries:

1. Tuberculosis
2. Pneumoconiosis
 - a) Coal Workers' Pneumoconiosis
 - b) Silicosis
 - c) Asbestosis
3. Byssinosis
4. Industrial Bronchitis and other respiratory conditions

*Chest Physician, Tata Main Hospital: Superintendent, A.M. Hospital and Professor of Chest Diseases, M-G-M-Medical College, Jamshedpur.

Tuberculosis :—

One of the most common of Chest Diseases that one comes across in the industrial sector in our country is Tuberculosis. A number of studies about the prevalence of tuberculosis in different industries have been carried out. Many of them show a higher prevalence than in the general population. Various factors that could have a bearing on prevalence of Tuberculosis are as follows :

- a) The age groups in industries range from 15 yrs to 60 yrs since these are the minimum and maximum average age limits. Thus age group 0 to 17 yrs, which has less Pulmonary Tuberculosis is not included.
- b) Industrial sector has a predominant male population. It is known that Tuberculosis predominates in higher age-group males.
- c) In a developing industrial sector, working force comes from villages. Compared to sheltered environment of village life, they are exposed to a crowded urban life in living area, during transport and at worksite. Chances of coming across infectious tuberculosis case is higher.
- d) The rigours of hard life with crowded living conditions, improper diet arrangements. Since many persons leave their families in villages, anxiety about family members not staying with them is likely to contribute to impaired resistance of the body.
- e) Certain industries where jobs are of a light nature involving much less physical work may draft in persons who are not perfectly healthy and consequently may not be in a fit condition to take up a job where physical fitness is necessary. Such industries then would draft in persons who are not keeping well—may have tuberculosis. Survey of such an industry would show unusually high prevalence. Bidi industry is one such example.
- f) Certain industrial processes might involve coming across substances which will impair lung resistance specifically and make persons susceptible to tuberculosis infection or reactivation as in silica industry.

On the other hand, in a well established and progressive industrial sector there are favourable factors such as :

- a) Pre-employment check-up which eliminates ill persons.

- b) Periodic health checks in certain sections routinely or as required by law.
- c) Good medical facilities for diagnosis and treatment.
- d) Good living facilities with housing and other benefits.

These different factors are required to be considered before we draw conclusions regarding higher prevalence in a particular industry. One has also to consider that many prevalence surveys are based on radiological assessment where errors regarding nature of the disease and its activity are likely to creep in.

The findings of some prevalence surveys are shown in Table 1.

In this table certain prevalence surveys in different industries in our country are given. The differences noted in the case of same industry by different workers and in different industries should be considered in the light of viewpoints mentioned above.

PNEUMOCONIOSIS

Inhalation of dust is known to be hazardous to health. Gold mines existed in Egypt in 50 B.C. period and the effect of working in mines on health were appreciated then. The credit for scientific approach to the miners health problem goes to Georgius Agricola (1556), who wrote 12 books on mining and in the 6th. book he described diseases of lung due to dust inhalation.

A monograph published by Paracelsus (1567) contained description of diseases of miners. The credit, however, for establishing occupational medicine goes to Ramazzini (1713) who is known as the father of Occupational Medicine.

Ramazzini made a striking addition to the Hippocratic Art—"when a doctor visits a working class home he should be content to sit on a three legged stool, if there is not a gilded chair and he should take time for his examination; and to the questions recommended by Hippocrates, he should add one more - what is your occupation?".

Zenker(1866) coined the term Pneumoconiosis.

The Radiological Classification as suggested by International Labour Organisation is shown in table 2

TABLE 1

Pulmonary Tuberculosis in Industries

Author	Industry	%Active Radiologically
Krishna Rao	Textile (S. India)	1.29
Goyal (1974)	Textile (Delhi)	1.8
Patel et al	Textile (Ahmedabad)	11.6
K.G. Gupta	Textile (Ahmedabad)	18.6
Deshmukhetal(1967)	Textile (Bombay)	3.1
Saxena	Bidi Industry	8.7(6.7)
Deshmukh et al	Bidi Industry (Nagpur-Kamptee)	3.9(.S)
Mitra	Cement Works	3.2
Chief Inspector of Factories	Industrial workers (Bihar)	6.3-19
Ukil(1948)	Industrial workers (Calcutta)	4.3-7
C. Srinivas Rao (5691)	Mica Mines Paper Mills	6.2(0.9)
A.C. Rao	Jute workers	3.4(1.2)
Chibetal(1967)	Army Personnel Eng. Industry	0.32

(Figures in brackets indicate bacteriologically positive cases)

TABLE 2

ILO's International Classification of Pneumoconiosis Radiographs (1980)

SMALL ROUNDED OPACITIES			
TYPE	p	q	r 3 to 10 m.m. CAT. 3
Diameter	Up to 1.5 m.m.	1.5 to 3 m.m.	VERY NUMEROUS
PROFUSION	CAT. 1	CAT. 2 FEW IN	Partly/Totally obscured
Opacities	NUMBERS Visible	NUMEROUS L.M.	
SMALL IRREGULAR OPACITIES			
TYPE WIDTH	s	t Up to 1.5 m.m.	u 3 to 10 m.m. CAT. 3
PROFUSION	1.5 to 3 m.m. CAT. 1		VERY NUMEROUS
Opacities L.M.	CAT. 2 FEW IN NUMBERS Visible		Totally obscured
	NUMEROUS Visible		
	Partly obscured		
LARGE OPACITIES			
	A	B	C
	Single Opacity diameter 10 to 50 m.m. or sum of diameters of opacities not more than 50 m.m.	One or more Opacities' combined area greater than Cat. A. but lesser than area of R.U.Z.	One or more opacities' combined area exceeds area equivalent to R.U.Z.

Coal Workers Pneumoconiosis

The earliest known reference to Coal Mining is found in the Saxon Chronicle of Peterborough (A.D. 852). Laennec (1819) was the first to mention about black deposits in the lung. In the 19th century, a variety of names were attached to the disease of coal miners. These included miner's Asthma, miner's Phthisis etc. It was not until the first decade of the 20th century that newer techniques such as chest radiography, histologic examination of tissue and the identification of tubercle bacilli allowed a distinction to be made of coal workers specific lung disease. The inhalation of coal mine dust may lead to the development of 3 pulmonary conditions:

1. Coal Workers' Pneumoconiosis
2. Silicosis
3. Industrial Bronchitis.

Since Silicosis and Industrial Bronchitis will be considered separately, we will first deal with Coal Workers' Pneumoconiosis.

Coal may be found on the surface or in the underground seams. The depth of the seam may vary from a few feet to a mile below the ground level. The deeper the seam, the higher the temperature of the mine. For geological purposes coal is customarily 'ranked' according to certain properties. Thus anthracite is ranked highest and is followed in descending order by bituminous coal, sub-bituminous coal and lignite. The highest ranked coals are the hardest, contain the least volatile matter and provide the greatest amount of heat.

Coal mining jobs include cutting of coal, loading on the transport system, hauling it to the surface, unloading and carrying to suitable sites. While everybody is exposed to a variable amount of coal dust, work at certain sites carries specific risks. Thus, the site where coal is actually cut is known as coal face. This is the most dusty part and the workers at this site inhale a very high amount of coal dust. Roof bolter inserts a 5 feet bolt with the help of an electric drill in the rock outside coal seam and is exposed to dust containing high amount of silica. The persons who handle the mechanised transport system frequently put sand on rails to get traction and are exposed to aerosolised silica dust.

Dust particles of size smaller than 5 μm are carried by inhalation to the alveolar region. Since they are too large to remain suspended, they are deposited on alveolar walls. Eventually, they become dislodged by respiratory movements and are engulfed by alveolar wall

phagocytes. The free dust particles and the dust laden phagocytes gradually move out of the alveoli into the bronchioles and are excreted in the sputum. When the amount of dust is large, this escalator system becomes slow and clogging starts occurring. The alveoli then contain coal dust and dust laden macrophages. Permanent fibrotic lesions develop after death of macrophages has provided the protein and lipid rich matrix needed for reticulin fibril production.

Coal Workers' Pneumoconiosis is subdivided into simple and complicated pneumoconiosis according to the radiographic appearance of the chest film. The radiological classification advocated by the 'International Labour Organisation' is now the most widely accepted.

Complicated Pneumoconiosis is diagnosed when there is a large opacity 1 c.m. or more in diameter. The radiographic diagnosis is subject to both inter and intraobserver variation.

Simple Coal Workers' Pneumoconiosis may not present with any symptoms and signs. Since many coal miners also smoke, symptoms of bronchitis often supervene. Complicated Coal Workers' Pneumoconiosis or Progressive Massive Fibrosis however causes exertional breathlessness, specific radiographic appearances and abnormal Lung Function Tests.

Since Progressive Massive Fibrosis causes symptoms of cough, breathlessness, occasionally haemoptysis and depicts upper lobe opacities, it is often confused with Pulmonary Tuberculosis. Intensive search for tubercle bacilli should be undertaken.

Prevalence of Coal Workers' Pneumoconiosis in India, U.K. & U.S.A is shown in Table 3. With improved methods of dust control, the prevalence has come down in developed countries.

In following the Rhonda Each population for 20 years Cochrane (1973) showed that although complicated pneumoconiosis was associated with increased standardised mortality ratio, simple Coal Workers' Pneumoconiosis had no effect on life expectancy. Similar findings were observed by Ortmeier (1973) and associates who followed a cohort of Pennsylvania miners for 10 years.

The prevalence of Coal Workers' Pneumoconiosis depends on dust levels to which miners are exposed, the period in years for which they are exposed, property of fragmentation of coal and the chemical composition of the coal. Periodical medical examinations with radiological investigations will help to detect cases of

TABLE 3

Coal Worker's Pneumoconiosis

Place	Population	CWP %	PMF %
DhanbaJ	8,822	General 10.8% Those put in 15 yrs. service 19.1% Those put in 30 yrs. service 26.0%	
Jharia & Raniganj	950	18.7%	
Year In Britain Coal Mines	1959 - 60 1978	13.4% 5.2%	1% 0.4%
In U.S. Coat Mines		10.1%	0 4%

Reduction of dust level below 2 mg./m³ reduces Prevalence to a negligible level.

Pneumoconiosis. It is very necessary that X-Rays should be taken with good films and proper technique. More awareness of the medical profession working in the coal belt area is -very necessary.

SILICOSIS

Silicosis probably existed in the paleolithic period, because prehistoric man manufactured flint implements extensively. Hippocrates in his 'Epidemics' speaks of the metal digger as a man who breathes with difficulty. The first report of what we call silicosis came from Isbrand Von Diemberbroeck, Professor of Medicine, Utrecht 1672 who described how several stone cutters died of Asthma and he found at autopsy that to cut their lungs was like cutting a mass of sand. In the succeeding centuries the association of dust containing silica and lung diseases and its predilection for tuberculosis was documented by several authors. Silicosis is acquired during direct operations with siliceous materials or mineral extraction in which the free silica is contained in the residual rock.

The specific name Silicosis (latin silex, flint) was applied by Visconti (1870). Intensive mining using pneumatic drills and modern energy sources made mining more dangerous.

Most of the earth's crust consists of compounds of silicon and oxygen. The

compound that is responsible for the development of silicosis is silicon-di-oxide which occurs in nature in 3 different crystalline forms—quartz, cristobalite and tridymite. Quartz is the most common of all and is a constituent of many rocks, such as granite and sandstone.

The development of silicosis depends on the inhalation of respirable free silica particles less than 10 um in diameter. The size range for maximal alveolar deposition is 1 to 3 um.

Events in pathogenesis of silicosis involve: 1. Inhalation of silica particles and their reaching the alveoli, 2. Ingestion of particles by macrophages, 3. Death of macrophages leading to liberation of substances which stimulate fibrosis. Autoimmunity may play a role in Silicosis. Usually a prolonged exposure of 10 to 15 years or more is required to produce typical silicotic changes in the lungs. But in another, not very common condition—Acute Silicosis, the exposure may be for a very short duration of 1 to 3 years. Acute Silicosis develops when very heavy concentration of respirable free silica is present in enclosed places with minimum protection.

The diagnosis depends on proper and accurate occupational history and roentgenographic evidence.

In a study of Silicosis of Refractory and Copper Mines Workers Deshmukh et al

(1982) found that major symptoms were breathlessness (47%), cough (30%) and chest pain (17%). But 45% of persons with radiological evidence did not have any specific symptoms. It was also noted that 20 % had normal ventilatory functions. It was also noted that ventilatory Lung Functions were related to the category of profusion.

Tuberculosis is often associated with silicosis. Diagnosis becomes very difficult because upper zone opacities with cavitation are seen in silicosis also. In many such cases anti-tuberculosis treatment is initiated. In fact in the study mentioned above 50% patients were receiving anti-tuberculosis treatment at the time of study. Obviously this is likely to have been due to over-diagnosis of tuberculosis in cases with Progressive Massive Fibrosis.

Table 4 shows prevalence of Silicosis in a few industries. It varies from 9% to 52% and is related to: (1) Proportion of free silica content of respired dust (2) Number of years exposure. And unless these two factors are taken into consideration, comparison would not be scientific.

It is possible to contain the hazard of

Silicosis by better control of environment, proper air quality and introduction of wet processes and substitution of silica wherever possible.

BYSSINOSIS

The word Byssinosis is derived from Greek word meaning fine linen or fine flax. It was mentioned by Greenhow (1860) and was described in detail by Jesse Leach (1863).

Byssinosis is an industrial pulmonary disease occurring in workers in the Textile Industry. It occurs principally in those exposed to cotton dust and has also been reported in occupational exposure to seisal, flax or hemp. In the Textile Industry it is seen mostly in the following departments :-

1. Coarse Mill
2. Blow Room
3. Card Room
4. Spinning Room
5. Weaving Mill—Brush stripping
6. Waste Mill.

TABLE 4

Silicosis in Different Industries

AUTHOR (S)	INDUSTRY	% OF SILICOSIS
Sikand & Pamra (1949)	Stone cutters (42)	52
Pande (1967)	Stone cutters	20.4
Gupta (1972)	Stone mason	35.2
Sutherland	Slate workers	15
Jarraan	Slate workers	14
Glover	Slate workers	33
Gupta (1970)	Refractory Bricks	16.9
Daniel Banks et al.	Silica milling (86)	38
Inspector of Factories	Mica Mines	34.1
Bruchner (1961)	Glass Industry	8.9
Patel (1974)	Glass Industry	16.6

Makers of ropes and twines from soft hemp (*cannabis sativa*) and workers processing soft hemp also suffer from Byssinosis. It was found that higher the dust concentration, more the number of byssinosis cases. Nearly 92% workers having byssinosis are exposed to a dust concentration of more than 2.5 mg./m³. Apart from dust concentration, another significant factor is dust particle size. It has been observed that dust particles of dimensions less than 5 μ contribute significantly to the process of byssinosis.

Many workers divide byssinosis into classical and indeterminate types. The classical variety is characterised by sensation of tightness in the chest and is initially experienced principally on the first working day of the week after the weekend leave or after a period of absence from the workshop. The symptoms develop during the afternoon of the first day of the work and usually subside in the evening. This situation may continue for several years without worsening and when the worker leaves the industry, his symptoms cease. In some, the condition progresses and the chest tightness

and breathlessness persist on Tuesday, then on Wednesday and so on until there is constant dyspnoea on every working day and finally throughout the week. The features of chronic bronchitis may be super-imposed at any stage and eventually it would be indistinguishable from chronic bronchitis with asthmatic features.

The symptoms in indeterminate type are predominantly cough with or without expectoration. Classical variety is seen most often in those exposed for 30 years and above whereas indeterminate variety may be seen in those exposed for 5 to 14 years. The symptoms are usually graded according to the severity from Grade 0 to Grade 3. Cigarette smoking potentiates the effect of cotton dust inhalation.

One entity known as cotton fever, mill fever or hemp fever consists of fever, chills, nausea and vomiting lasting for a few days and occurs in workers first joining tlv. industry, or returning to it after a prolonged absence. The symptoms occur in a small proportion of workers exposed, develop after 6 hours of

TABLE 5

Prevalence of Byssinosis in Carding Room

Country	Author	Year	% of Byssinosis
W. Germany	Btider	1963	72
Sweden	Belin	1965	25-63
England	Schilling	1962	63
Egypt	Batavi	1962	27
England (Lancashire)	Molynex	1970	26.9
India-Kanpur	Siddhu	1966	9.03
India-Delhi	Vishwanathan	1966	8.4
India-Madras	Thiruvengadam	1970	8.0
India-Bombay	Raghavvan	1964	7.63
India-Ahmedabad	Gupta	1975	7.3

exposure and stop abruptly when exposure ceases. Tolerance develops after a few days.

Etiology. :-

1. Theory of Allergy—not fully convincing.
2. The dust may contain a substance which has a bronchoconstrictor effect. This substance may be methyl piperonyl pte.

Lung Function:

Byssinosis is associated with a significant fall in ventilatory capacity and progressive increase in airway resistance during the course of the day.

Prevalence:

Table 5 depicts the prevalence of byssinosis. There is a wide variation possibly due to criteria which could not be uniform because of subjective element variation.

Prevention:

Suggested steps:

1. Strict pre-employment check for those recruited in specific departments.
2. Periodic medical examinations.
3. Efficient Ventilatory System.
4. Removal of impurities from cotton. It may be that the causative agent in the dust resides in impurities and not in the cellulose fibres of cotton.
5. The substitution of natural fibres by risk-free man made fibres might seem to be the ultimate solution.

ASBESTOSIS

Asbestos which means 'inextinguishable' was used in Finland to make pottery 4,000 years ago. Charlemagne is said to have possessed a table cloth made of it. The commercial mining of asbestosis began in Quebec in 1879.

Asbestos is a mixture of silicates of iron, magnesium, nickel, calcium and aluminium and occurs naturally as fibre, and is resistant to high temperature. The manufacture of asbestos involves crushing rock to yield fibres and amorphous powder. Mining and manufacturing process involves much dust.

Asbestos has wide range use. Many industries e.g. fire-proof clothing, brake and clutch lining,

asbestos cement, paints, tyres, flooring compounds, electric wire insulation etc use asbestos. Between 1877 and 1967, asbestos production and use has increased 80,000 times.

Types of Asbestos: There are 4 main types of asbestos fibres:

1. Chrysotile (white silky fibre)
2. Crocidolite (blue fibre)
3. Amosite (brown & harsh)
4. Anthophyllite.

Differences in the physical properties of the various fibres determine their particular commercial usefulness.

Persons exposed to asbestos are:

1. Those involved in mining of asbestos
2. Manufacturing process involving asbestos
3. Neighborhood areas of asbestos mines
4. Family members of asbestos workers who bring the dust in overalls.

Fate and biologic effects of inhaled particles:

The fate of inhaled particles depends on the aerodynamic behaviour of the particles and the dimension of the respiratory tract. As in any dust, larger particles are trapped in the upper respiratory passages and the small dimension particles enter the alveoli. Some of the asbestos fibres become coated. Coated asbestos fibres were recognised early in the 1900 because of their characteristic appearance. It is usually a rod shaped structure with clubbed ends, often beaded along its length; is yellow to brown in colour and ranges in length from 10 to 30 μm and in thickness from 1 to 6 μm . The coating consists of ferritin granules and amorphous material pertinacious in nature. There is some evidence that the coating of a fibre renders it non-fibrogenic. Why some fibres get coated and others do not is not understood. The so called asbestos bodies are net characteristic of asbestos fibres only and such bodies may occur with glass or cotton fibre, talc, graphite and hence the term 'Ferruginas' has been suggested merely for exact description.

Cellular effect:

Hatch felt that apart from response to the amount of dust, there is another dimension—susceptibility—which may be considered as variable immunological response.

Asbestos inhalation leads to the following Pulmonary conditions:

1. Pleural Plaques or Calcification

2. Pleural Effusion
3. Malignant Mesothelioma of Pleura
4. Diffuse Interstitial Fibrosis
5. Lung Cancer.

The aim of all these measures is to detect at a point of time when further progress of effect could be stopped.

INDUSTRIAL BRONCHITIS

Since asbestos is used in numerous industries, is indestructible and is responsible for serious pulmonary conditions, it is expected that in the years ahead health hazards due to asbestos will be more evident.

In the 19th Century, Thachrah (18²) and Greenhow (1861) had noted increased prevalence and high death rate due to bronchitis in certain occupations. However the term bronchitis is many times loosely applied. Cough and sputum is present in many conditions for a variable period and diseases like Tuberculosis, Pneumoconiosis itself, smoking related bronchitis and air pollution have to be considered in this context. It would be better to consider the definition of cough and sputum for at least 3 months in a year for successive period of 2 years related to the long continued inhalation of dust as a base for comparison.

Table 6 shows relative risk of Lung Cancer in asbestos workers and its relation with concentration. It has been observed that smoking definitely enhances the hazard of asbestos inhalation.

Certain steps are necessary to contain the fast increasing problem of asbestos diseases. These would consist of:

The Medical Research Council of Great Britain in (1966) published a committee report which concluded that "on present evidence intensity of dust exposure doesn't appear to

1. Strict environment control with periodic measurement of dust control
2. Prohibiting smokers strictly from asbestos work
3. Medical surveillance

TABLE 6

Association Between Mesothelioma and Asbestos Exposure

Country	Cases of Mesothelioma		Control Subjects		
	NO Exposed	%	NO Exposed	%	
U.K.	239	73	239	31.5	Relative Risk of Lung Cancer Observed/Expected Number of Deaths Sclikoff & Associates 7.4 Dunn & Associates 3.6 Enterline 3.0 Cooper & Betzer 7.8
U.S.A.	99	48	86	20	
Canada	190	26	182	7	
Sweden	34	53	34	12	
Exposure Response Relationship in Asbestos Miners & Millers					
*Dust Index		100	200	400	800
Death Rate/Thousand Persons Respiratory Cancer				13	
16	21	32			
Pneumoconiosis		1	5	5	24
* Million Particles per Cubic Feet Per Year					

be a very significant factor in determining the presence of bronchitis in group of workers”.

On the other hand when compared with a control population, a significant increase in the prevalence of cough and sputum has been observed in many men working in dusty occupations. Thus Higgins (1959), Worth et al. (1959), Higgins (1972) in Coal miners, Love et al. in Steel Workers, Merchant et al. (1972) in Textile Manufacturers, Swiscremer et al. 1967 in Gold miners have found increased prevalence of cough and sputum. It has also to be considered that a point survey may not give an accurate picture of prevalence as many persons who become unwell after joining might leave the industry and only fit persons would continue to work. It was earlier thought that bronchitis would be usually associated with reduction in ventilatory capacity. But Fletcher and Peto (1977) and Bates (1973) made it clear that bronchitis and airways obstruction are not always related.

Studies have revealed a casual relationship between the level of dust exposure and bronchitis. Workers where the dust exposure was high had more bronchitis than those who worked away from sites of dust exposure in the same Industry. These studies have included both smokers and non-smokers Rae (1971), Klimfeld (1973)].

O’ Shea et al. (1970) in a study of 428 subjects from amongst 9,000 coal miners, grouped them into 4 groups:

1. Smokers with Bronchitis
2. Smokers without Bronchitis
3. Non-Smokers with Bronchitis
4. Non-Smokers without Bronchitis.

This study considered flow volume curves and expressed flow rate as a percentage of VC and TLC. It was found that while cigarette smoking affects flows at all lung volumes, industrial bronchitis affects peak flow and flow at high lung volumes. Although industrial bronchitis leads to a moderate increase in the RV thereby suggesting that small airways are not entirely spared, it does not increase TLC whereas cigarette smoking leads to increase TLC.

It has also been propounded that when dust particles are of the size 0.5 to 5 μm in diameter, they enter the terminal bronchi and alveoli and are responsible for pneumoconiosis whereas dust particles of size 5 to 20 μm in diameter deposit in trachea and bronchi and contribute to bronchitis and are responsible for reduction in Ventilatory Capacity, Apart

from industries where dust is generated, other industries also produce bronchitis.

Manufacture of fuel gas by destructive distillation of bituminous coal is carried out by many industries mainly by the Tower gas plants and Steel plants. In a study of gas plants, Singh & Bhar (1974) found bronchitis in 12% of exposed workers as against 6.8% in control group.

Other respiratory problems in Industry:

Apart from principal diseases of chest mentioned above Industrial environment contributes to numerous other respiratory problems. It is not possible to cover all these aspects in a short time.

Air pollution is a subject by itself. A number of studies have noted the growing respiratory complaints in highly industrialised areas. In certain cities Ozone concentration increases and leads to irritation of respiratory tract. Automobile exhaust fumes add to the irritation in bigger cities. Industries where gases containing oxides of nitrogen are inhaled may lead to serious pulmonary oedema.

Symptoms of sneezing, running of nose, tightness of chest with wheeze and dyspnoea are also observed in an exposure to certain chemicals or metallic fumes. Welding of different types also produces respiratory complaints. The list of different chemical processes or metallic industries which produce lung irritants is a long one. It is only to focus attention that persons in such industrial environment may repeatedly seek medical advice for their respiratory problems.

To conclude, I have tried only to outline briefly a few chest problems in industry. Awareness of relationship of different chest conditions and industrial processes is necessary.

It is only then that preventive steps can be taken to minimise the hazards.

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ACTIVE CASE FINDING IN TUBERCULOSIS AS A COMPONENT OF PRIMARY HEALTH CARE

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Summary: Feasibility of introducing limited active case-finding in Tuberculosis involving Multi-purpose Health Workers (HWs) to supplement the existing methodology of detecting the cases through symptomatics attending PHIs on their own, was studied earlier with encouraging results. The present study was undertaken to understand the existing working system of HWs and within that the priority areas of input which may lead to better case yield. The study revealed that the available population at any Beat Schedule of HWs was about 42 % of the eligible population of the age 20 years and above; only 60-75 % of the field days were utilized for routine multi-purpose duties; 25 % to 40 % of the area remained uncovered; the effective Tuberculosis work was done only on 5 % of the Beat Schedule days and the work was not uniformly spread throughout the month.

Even so, the contribution by HWs was twice the number of cases diagnosed at study PHCs in one year. Had the HWs covered the entire area of their Beat Schedule, 80 against 26 cases would have been diagnosed. Moreover, there is possibility of detecting more cases among the elderly patients who normally do not attend their Area Health Centres. However, the success depends upon meticulous supervision and regular flow of supplies.

Introduction

The feasibility of introducing active case-finding through Mass Miniature Radiography in National Tuberculosis Programme was studied and found neither operationally feasible and economically viable nor rewarding so far as the yield of cases was concerned.

The results of a sociological study (Banerji and Andersen, 1963) on the awareness of symptoms among persons with pulmonary tuberculosis have been applied to the operational pattern of case-finding in District Tuberculosis Programme (DTP). This was tested successfully in a study of the potential yield of cases through symptomatics* attending on their own at Peripheral Health Institutions (PHIs), (Baily et al, 1967). This passive case-finding methodology has since become an established DTP procedure. However, the achievement under this procedure is much below the expectation in an operational situation. Further, there is no operational feasibility of reaching those who are not reporting to PHIs.

Introduction of Multi-Purpose Health Workers (HW) Scheme, previously known as Multi-Purpose Workers Scheme (Ministry of Health & Family Welfare, 1973) is a recent modification in the Health Care Delivery System to render Primary Health Care to the community. Under the Scheme, a HW visits

each house at regular intervals. Thus, a distinct machinery has emerged to supplement the passive case-finding methodology with that of limited active case-finding activity. The feasibility of this procedure was studied with encouraging results (Aneja et al, 1980).

The present study was undertaken to assess the additional contribution of cases through this active case-finding approach, as well as to understand the entire working pattern of HWs so as to identify the areas in which the priority of input may result in better case yield.

Study Area

For operational convenience, the possibility of conducting the study in any of the southern States was explored. Among these, Andhra Pradesh was selected as that was the only State where HW scheme had been fully implemented at the time of planning of the study. On the advice of the State Government and because of the administrative support at the District level, Nellore District was chosen. Three Primary Health Centres (PHCs) of the district namely Mypadu, Varigonda and Thurimerla were selected on the basis of availability of HWs, the microscopists and the willingness of the Medical Officers (MO) of the PHCs to participate in the study.

All the male HWs available in each PHC

I. TB Specialist, 2. TB Specialist, 3. Assistant Training Officer, 4. Medical Officer, 5. Statistical Assistant.

From National Tuberculosis Institute, Bangalore.

*Symptomatics are those who have one or more of 'Chest Symptoms' namely cough, chest pain, fever of two-weeks' duration or more or haemoptysis irrespective of its duration,

were included and the case-finding activity carried out by each one of them in his entire area was studied. The details of their involvement are presented in Table 1. In Thurimerla, 16 of the 18 HWs in position could only be trained. Further, the functioning for the entire study period of one year in respect of only 11 HWs could be studied. The rest of the 5 HWs were transferred at different points of time during the study period. Their functioning was studied upto the point they were in position in the PHC area. The working of all the HWs trained in other 2 PHCs was studied for the entire study period of one year.

In all, the functioning of 33 HWs was analysed.

Training

The concerned HWs were trained at the beginning of the study to perform the following functions:

1. Identification of symptomatics eligible for sputum collection.
2. Collection of sputum, preparation of smear, fixing it and disposal of the left-over material.
3. Despatch of slides to PHC.
4. Communication of results, and
5. Motivation of cases put on treatment.

A three day training camp was organised in the first week of July 1981, in each of the three selected PHCs. The training was given by MOs and Laboratory Technicians (LT) deputed by the National Tuberculosis Institute (NTI). All the HWs and their concerned supervisors were trained as per lesson plan prepared on the guide lines issued by Ministry of Health & Family Welfare, Government of India (Ministry of Health & Family Welfare, 1978).

Procedures

Each HW was provided with necessary 'supplies to carry out the work in the field. During his 'Beat Schedule' to each household in the allocated villages, the HW was to question and identify the symptomatics in the age group 20 years and above only, as 93 % of the cases are prevalent in that age group (Raj Narain, 1965). A tick mark was made against the names of the symptomatics so identified, in the "Family Register" and entries were made in Referral Slips designed for the purpose of the study'. Spot sputum collections were then made, smears prepared and fixed. The smears so prepared with identification number written on them, along with the Referral Slip in duplicate, duly filled-in were despatched either through the supervisor when the latter met the HW or by any other means of despatch feasible locally.

When the smears reached the PHC, these were registered in the sputum register of the PHC along with the code number of the referring HW. The examination of the smears in the initial 3 months was done by LT (NTI), who was posted Inhere. The purpose for deputing the LT (NTI), was to take care of the excessive workload expected in the first three months and also to train the Microscopists in sputum examination, recording and reporting for the study. The LT (NTI) did not influence the working of HWs in any manner. After three months, the entire work was carried out by the Microscopist of the concerned PHC. The results were entered in both the copies of the Referral Slip as well as the sputum register of the PHC. One copy of the Referral Slip was filed in the PHC and later collected by the study team for analysis. The other Referral Slip was sent to the concerned HW by post. The result was communicated to the patient by the HW on

TABLE 1

Health Workers (Male) involved in the study

P.H.C.	Posts Sanctioned	No. Functioning	No. Trained	No. Studied	
				For One Year	Upto the Point of Transfer
Varigonda	10	9	9	9	—
Mypadu	12	8	8	8	—
Thurimerla	19	18	16	11	5
Total	41	35	33	28	5

his next routine visit to the concerned village. The individual patient found to be sputum positive was also informed by post by the M.O. of the PHC with the request to the patient to come to PHC for initiation of treatment. The MO of each PHC sent a report to NTI regarding each HW every month on the following points:

- i. No. of days spent exclusively on priority programmes.
- ii. No. of days spent on routine work.
- iii. No. of symptomatics identified,
- iv. No. of smears prepared and number found positive.

In addition to the above, the following information was also reported:

- i. No. of new out-patients.
- ii. No. referred for sputum examination and found positive,
- iii. No. of cases put on treatment as diagnosed through:
 - (a) Out-patient Department, and
 - (b) HWs.

The routine procedures adopted by HWs were allowed to be carried out with the normal routine supervision. Periodic visits were also made by the study staff to understand the functioning of the system and for collection of missing information. They, however, did not meet the HWs in the field and no effort was made to influence their routine working.

The field work of the study commenced in July 1981 and ended in June 1982.

Findings

1. Population Covered

The total population covered in the 3 selected PHC areas where 33 HWs worked, range from 61,615 in Mypadu to 1,19,997 in Thurimerla. On an average, a HW was allotted a population of 8,066 in Varigonda, 7,702 in Mypadu and 7,500 in Thurimerla living in 1861, 1630 and 1219 households respectively. Thus, each HW was expected to visit 93.82 and 86 households in respective PHC each day. The population in the age group 20 years and above to be covered daily by each worker was around 200.

The HW was expected to cover the entire allotted area in 200 days field duty in a month as per Beat Schedule, prepared much in advance. However, only 75.6%

of the total Beat Schedule in Varigonda, 66.7 % in Mypadu and 59 % in Thurimerla, was spent for routine multi-purpose work. Thus, 25% to 40% of the population remained uncovered in their monthly Beat Schedule.

2. Work Output

i. Identification of Symptomatics and Preparation of Smears

The total number of symptomatics in eligible population as identified by the HWs during the study period of one year was 151 in Varigonda, 115 in Mypadu and 126 in Thurimerla.

Effort was made to find out the proportion of the Beat Schedule days on which the workers actually associated themselves in the effective tuberculosis work. It varied from worker to worker. It was only on 85 of the 1634 days in Varigonda; 58 of 1281 days in Mypadu and 88 of 1994 days in Thurimerla that at least one smear was prepared by the workers. Thus, it was only about 5% of the Beat Schedule days on which effective tuberculosis work was done. Further, except in Thurimerla where the work was uniformly spread throughout the month, in the other two Centres, 2/3 of the work was concentrated in the second half of the month.

The distribution of symptomatics detected by HWs in each month is provided PHC-wise in Appendix Table I-III.* The identification of symptomatics was expected to be influenced by the training imparted, the interest taken by the individual worker, the consistency with which he worked and other extraneous factors pertaining to a particular Centre. It is evident from the Tables that there was no set pattern of output between worker to worker or month to month. In Thurimerla, one of the workers identified as many as 50 of the 126 symptomatics detected by all the 16 workers put together. This variation is also seen in other Centres though, to a lesser extent.

Smears were not prepared during 47.2% of the HW months in Varigonda, 60.4% in Mypadu and 71.6% in Thurimerla. On an average, a HW prepared around 3 smears per month when he effectively associated himself with tuberculosis work.

The age and sex distribution of the symptomatics identified is shown in Table 6.

*Appendix table are not included in this presentation but may be obtained from the National Tuberculosis Institute, Bangalore.

TABLE 3

Actual Coverage of Beat Schedule by H Ws in one year

P.H.C.	No. of HWs	Beat Schedule				
		No. of Working Days				
		Expected	Actually Worked	% of Expected	Range per HW	Range per month
Varigonda	9	2160	1634	75.6	150—208	111—157
Mypadu	8	1920	1281	66.7	125—199	66—127
Thurimerla	16	2880	1994	59.0	*93— 187	**134— 237

*Pertains to the HWs who worked for all the 12 months.

**Pertains to the months when all the 16 HWs worked (July 1981—December 1981)

TABLE 4

HWs Performance for Smear Preparation

P.H.C.	No. of HWs		No. of Smears Prepared				Days Smear Prepared		
			No. of Days Actually Worked	Total	Range Per HW	Range Per Month	No.	% to Total Days	% Prepared in 2nd Half of Month*
	1	2	3	4	5	6	7	8	9
Varigonda	9	1634	151	1—33	2—33	85	5.2	70.6	
Mypadu	8	1281	115	6—21	0—30	58	4.5	72.4	
Thurimerla	16	1994	126	0—50	0—35	88	4.4	51.1	

NOTE: *The figures in this column are the percentage of the performance days (column 7) falling in the second half of the month.

Amongst the symptomatics detected, the proportion of males was 51.7%, 63.5% and 63 % in Varigonda, Mypadu and Thurimerla respectively. Further, 47.7% in Varigonda, 47.8 % in Mypadu and 62.2% in Thurimerla were the symptomatics in the age groups 45 years and above.

ii. *Case Yield*

Of all the smears examined, 1, 6 and 19 cases were detected at Varigonda, Mypadu and Thurimerla respectively. The positivity rate varied from 0.7% at Varigonda to 15.1% in Thurimerla. Of the total 26

TABLE 5

Distribution of number of smears' made in a month by HWs

No. of Smears Per Month	Varigonda		Mypadu		Thurimerla	
	No. of HW Months	% to Total	No. of HW Months	% to Total	No. of HW Months	% to Total
0	51	47.2	58	60.4	121	71.6
1	13	12.0	3	3.1	21	12.4
2	19	17.6	11	11.5	14	8.3
3	9	8.3	15	15.6	4	2.4
4	11	10.2	3	3.1	3	1.8
5	2	1.9	4	4.2	2	1.2
6	2	1.9	1	1.0	1	0.6
7	1	0.9	1	1.0	1	0.6
15			—	—	2	1.2
Total	108	100.0	96	100.0	169	100.0
Monthly Average PerHW		2.6		3.0		2.6

NOTE: Monthly average is calculated excluding the months when no smear was prepared.

cases, 18 were males and 17 were in the age group 45 years and above.

3. Augmentation of Case-finding

During the study period, 26, 101 and 22 sputum smears were examined at Varigonda, Mypadu and Thurimerla from amongst the symptomatics attending the Centre on their own. No case was found in Varigonda. However, 10 and 3 cases were detected in Mypadu and Thurimerla respectively. The addition through HWs was 26 cases. Thus, the contribution by HWs was twice the number of cases diagnosed at these Centres through symptomatics attending on their own.

Scrutiny of the smear examinations during the corresponding months in the previous year revealed that the active case-finding

through HWs had not affected the number of symptomatics attending the PHCs. In fact, there was an improvement in the number of symptomatics identified and smear examinations done from amongst the attending patients at the Centre itself.

4. Operational Factors Observed

The smears were mostly being brought personally by the HWs when they visited the PHC, but occasionally, these were sent along with the malaria slides. During the whole of the study period, only one smear did not reach the Centre and one slide was found broken in transit.

In Thurimerla, the Laboratory Assistant was sent for Sanitary Inspector's Training Course, early in December 1981. This

TABLE 6.

Age & Sex Distribution of the Chest Symptomatics

Age & Sex	Varigonda		Mypadu		Thurimerla	
	No.	%	No.	%	No.	%
20—24	14	9.3	5	4.3	5	4.2
25—34	38	25.2	35	30.4	15	12.6
35—44	27	17.9	20	17.4	25	21.0
45+	72	47.7	55	47.8	74	62.2
Male	78	51.7	73	63.5	75	63.0
Female	73	48.3	42	36.5	44	37.0
Total	151	100.0	115	100.0	119*	100.0

NOTE: *Age and sex not recorded for 7 persons.

TABLE 7

Case Finding activity at PHC and by HWs during the study period

P.H.C.	P.H.C.				HW					
	New OPA No.	Symptomatics Identified %	Cases Found for Symptoms No.	Cases Found No.	Estimated Population %	Symptomatics Identified %	Cases Found Questioned No.	Cases Found %		
Varigonda	10093	26	2.58		139085	151	1.09	1	0.7	
Mypadu	24149	101	4.18	10	9.9	104098	115	1.10	6	5.2
Thurimerla	13331	22	1.65	3	13.6	157824	126	0.80	19	15.1

Adversely affected the collection of smears in the field. Later on, a BCG Worker was appointed, who was supposed to bring the smears to the District Tuberculosis Centre (DTC), but in spite of the alternate arrangements, the work never picked up. In Mypadu, MO was transferred in the latter half of the year. The new MO who joined in his place, however, took proper interest and the work was not affected.

The HWs Mypadu reported that sufficient quantities of spirit and cotton were not made available to them. There was also difficulty in the disposal of left-over material, as they did not get sufficient waste materials to burn it. The fear of risk of getting the disease was also lurking in their minds and they demanded.

In Varigonda, some of the cases might be

going direct to DTC as the PHC was very close to the District Headquarters. This, perhaps, also explains very low positivity rate at that Centre as compared to the other PHCs.

Discussion

A fixed monthly programme of field work called the Master Plan is chalked out in the beginning of every year for each HW. The allotted area is divided into 20 groups to be covered in 20 days of the field work in a month for routine multi-purpose work. The fixed programme can, however, be changed in consultation with the MO in exigencies like Family Welfare camps or other functions to which top priority is to be given. The area missed on this account remains uncovered during that month.

As per study results, only 60-75 % of the field days were utilised for routine multi-purpose duties. Utilization of some of the Beat Schedule days exclusively for priority programmes is expected and perhaps, is desirable, e.g., under Family Welfare each HW has to motivate and bring at least 3 cases to the PHC for sterilization.

It is evident from studies conducted earlier (Joshi et al, 1978 and Radha Narayan et al, 1983) that in normal operational situation, 25% of the houses will be found locked by a HW during his Beat Schedule and in another 5 % the adult members of the households will not be available. In the rest of the households, a proportion of the persons would have left for the field or gone out of station by the time the HW reaches the village. Taking all these factors into consideration, it is estimated that the available adult population at any Beat Schedule is about 42 % of the eligible population. Further, a HW on an average, spends about 2 hours a day for the actual home visits. This permits an average of 3 minutes per household with some adjustments here and there. The involvement of HWs for case-finding and case-holding in tuberculosis has to fit in the above mentioned working system. In order to improve the case-finding, areas have to be identified within the existing working system wherein better input could be made to achieve the maximum output. For that purpose, firstly, the existing level of functioning of the HWs against the expectations is to be worked out and secondly, areas where more input has to be made, have to be identified.

Taking into consideration the coverage of area, availability of the eligible population, the prevalence of symptomatics in the community and the field efficiency of the HWs in this activity, 0.5% of the eligible population, is

expected to be detected as symptomatics by the HWs initially, later decreasing to about 0.1% (Aneja et al, 1980). Thus, around 35 persons per month in Varigonda, 30 in Myspadu and 60 in Thurimerla were expected to be symptomatics and in all 420, 360 and 720 sputum smears should have been examined in the respective Centres in 1 year. Against this, only 151, 111 and 126 smears were examined in the respective PHCs giving an overall performance of 26%. Of the total 372 smears examined during the study period, 26 cases were detected giving a positivity rate of 6.6%. At this rate, had the expected 1500 smears been examined, about 100 cases would have been diagnosed. There is, thus, a large scope for improvement in case detection through the HWs.

The study also shows that during 50-70% of the HW months, no smears were prepared. It was only on 5% of the routine field work days that the HWs associated themselves effectively with the tuberculosis work. This is possibly due to the low priority given to tuberculosis by HWs. In a sociological study (Radha Narayan et al, 1983), it was revealed that HWs give 7th or 8th priority to this function. Thus, there is a case of changing the attitude of HWs who still feel that tuberculosis work is something which is being thrust upon them and which might be a risk for their health. Creation of a sense of urgency about the disease, removal of fear of risk of getting the disease and meticulous supervision, may improve the situation.

In 2 of the 3 PHCs 2/3 of the tuberculosis work was concentrated in the second half of the month. This leads to coverage of a portion of the allotted area only. Possibly, certain areas are left out for tuberculosis work. Further, most of the smears were brought to the PHC personally by the worker. If they all bring the smears on the same day, the work of the microscopist is not staggered and there is concentration of the work-load for him during a particular period. This may result in delay in communication of results and initiation of treatment. The efficiency of the tasks is thus lowered. As a first step therefore, the input has to be made in the areas identified above, within the existing working system of HWs. If the HWs cover their entire area of Beat Schedule evenly and collect at least 3 smears each month, nearly 1200 smears could have been prepared and about 80 cases detected. Further improvement however, could only be expected if the frame work of the working system of HWs as such is changed.

As it is, 26 cases were diagnosed through reference of sputum smears during the study

period of 1 year, against 13 cases detected in the PHCs from amongst the symptomatics attending on their own.

Under the 20 Point Programme, a target of the examination of 50 smears from amongst the out-patients attending a PHC for chronic chest symptoms per month has been fixed up (Government of India, Ministry of Health & Family Welfare, 1983). Accordingly, it is expected that about 180 cases would be diagnosed in the study area in 1 year. The expected additional contribution through HWs as worked out above, would be around 80 cases. A considerable boosting effect therefore could be expected through active case-finding as a supplementary effort at PHC level.

The study shows that nearly half the cases detected by the HWs were among the symptomatics in the age group 45 years and above. But, precisely, this is the age group which usually does not utilise its area health centre. A study in this regard showed that elderly persons who constitute a major reservoir of tuberculosis, tended to disregard their symptoms and do not avail the health facilities more freely (Nagpaul et al, 1977).

Active case-finding through HWs has a great potential of supplementing the existing passive case detection from amongst the symptomatics attending on their own at PHCs. Moreover, there is a better possibility of detecting the cases from among the elderly patients who normally do not attend their area health centres. However, the success of this approach depends upon proper supervision and flow of supplies.

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A STUDY TO DETERMINE THE RELIABILITY OF ASSESSING THE REGULARITY OF SELF-ADMINISTRATION OF DRUGS AT HOME BY PATIENTS' ATTENDANCE AT THE CLINIC

S. GEHANI, V.K. PERUMAL AND G.P. MATHUR*

Summary: Domiciliary self-medication among 250 pulmonary tuberculosis patients was verified by two methods: (i) surprise pill counting, and (ii) urine test. The findings were compared with patients' subsequent attendance for drug collection. It was found that of patients attending punctually for drug collection, only 6% had more than 3 days' excess drugs at the time of pill counting. Further, of patients claiming to have taken drugs during the previous 24 hours, 14% were not telling the truth.

Mass treatment schemes in developing countries with limited resources necessarily entail self-medication on the part of a large number of patients. The usual procedure is for patients to collect drugs for self-medication from the treatment centres periodically and to consume the drugs daily or twice a week according to the prescribed regimen. In such situations it is difficult to be sure whether the patients do in fact take the treatment as prescribed. It is often assumed that drug collection is synonymous with drug consumption. To what extent this is really true depends on many factors such as motivation provided at the treatment centre, presence of symptoms, general educational background of the patient and his family etc. The question whether drug collection can be considered synonymous with drug consumption, is, nevertheless, too important to be ignored and is likely to gain in importance in the future, if and when, short course chemotherapy regimens are introduced on a large scale. Since the initial intensive phase of treatment in these regimens is of crucial importance, it is essential to know how far the assumption of drugs consumption based on drug collection is justified. The present paper is an attempt to answer this question, based on experience with conventional one year regimens currently in vogue.

Material & Methods

The study was carried out among 250 newly registered cases reporting at the New Delhi TB Centre during 1981 and residing in the area falling under the jurisdiction of the Centre for purposes of domiciliary treatment of tuberculosis. The treatment policy at the Centre during the period under study was, in general, to give 2-drug treatment supplemented during the early periods with a third drug, usually streptomycin, in patients who were bacteriologically positive at start. The present paper deals only with the first year of treatment. Since compliance with instructions regarding drug

intake may vary with the pressure of symptoms* and, further, because symptoms themselves might vary in intensity with the passage of time, care was taken to ensure that observations on the patients included in the study were made at different periods during the course of one year treatment. In order to avoid possible bias, each patient was observed only once for purposes of this study. Thus, 70 patients were in the first quarter, 63 in the second quarter, 56 in the third quarter and 61 in the fourth quarter of treatment when data relating to them were collected. One is thus, in a position to assess whether compliance with instructions changes from the first to the fourth quarter.

Of the 250 patients, 150 (60.0 %) were males and 100 (40.0%) females. Two percent were below 15 years of age, 72 % between 16 and 35 years, 18 % from 36 to 55 years and the remaining 8 % above 55 years of age. Bacteriological evidence of disease was available in 61 % at start. Over 80% of patients had had no or less than 1 month's treatment before they came to the Centre and only 6% had more than 3 months' treatment at the time of reporting.

For patients belonging to the domiciliary treatment area of the Centre, the treatment procedure may be described as follows :

After diagnosis, drugs for self-medication are handed over to the patients for 4-weekly periods at a time. At start of treatment, patients are motivated regarding the importance of regular and uninterrupted treatment. If a patient does not attend for any drug collection within 3 days of the due date, the health visitor pays a home visit to retrieve the default. Further visits are paid, if necessary. For purposes of the present study, however, a special surprise visit was paid to the patients' homes in order to check on drug consumption. This was done in two ways (i) by pill counting and (ii) by on-the-spot 'examination of the patient's urine through a specially prepared strip made according

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to the method suggested by Belles and Littleman to detect the presence of INH metabolites in urine. On the patient's next visit to the Centre for drug collection information was available about the number of days by which the patient was late for drug collection. The analysis that follows is thus based on the relationship between the three types of data collected, namely (i) punctuality of attendance for drug collection (ii) result of surprise pill counting, and (iii) result of surprise urine test to verify drug intake.

It may be pointed out that there is an important difference between pill counting and the urine test. Whereas surprise pill counting can give us an index of the patients compliance for the entire period from the date of the last collection to the date of the pill count, the urine test can only test the veracity of the patients' statement regarding drug intake during the last 24 hours or so. The two, therefore, serve different purposes and should be regarded as complementary rather than comparable.

Results

Table 1 shows the regularity of drug collection against the findings of pill counting.

It would be seen that of the 250 patients, 124 i.e. nearly half attended exactly on the due date. Another 10% attended 1 day late, 9% 2 days late and 9% 3 days late. Thus, 78% of the patients collected their drugs within 3 days of the due date.

It would be interesting to note how these patients fared on pill counting. In all 63 % of the patients had a perfect pill count, 13 % had excess drugs for 1 day, 10 % for 2 days and 4 % for 3 days. Thus, 90 % of the patients had either no or upto 3 days' excess drugs. As we have seen earlier, the corresponding percentage for drug collection was 78 %. The difference between the two figures can be due to patients neglecting to take drugs for one or more days between surprise pill count and the next collection.

Analysing further the 124 patients who collected drugs punctually, it was found that 70% of these had a perfect pill count. For reasons stated earlier one might perhaps allow a grace period of 3 days and this would account for another 24% of the patients. This leaves 6% patients whose punctual attendance could be considered misleading since their pill count had shown an excess of more than 3 days.

TABLE 1

Delay in drug collection related to findings of surprise pill count

Delay in drug collection (days)	Excess drugs found during surprise pill count (days)							Total	
	0	1	2	3	4—6	7—9	10		
0	87	16	8	6	5	1	1	124	50%
1	17	6	1	—	1	1	—	26	10%
2	12	4	5	—	2	—	—	23	9%
3	12	2	5	—	2	—	1	22	9%
4—6	17	2	1	2	2	1	1	26	10%
7—9	5	1	2	—	3	2	2	15	6%
10—	7	2	2	1	2	—	—	14	6%
Total	157	33	24	9	17	5	5	250	100%
	63%	13%	10%	4%	7%	2%	2%		

Considering next the 71 patients who collected drugs 1, 2 or 3 days late, it was found that 58 % of these had a perfect pill count and another 32% excess drugs for 1, 2 or 3 days. Of the remaining 10% it could be said that their attendance was a misleading index of their actual drug consumption. As for patients who attended late for drug collection by more than 3 days, as many as 53 % returned a perfect pill count and it must be presumed that either they neglected self medication after the pill count or were trying to mislead the health visitor by throwing away their drugs. Since pill counting is not a routine part of the health visitors functions, the latter possibility must, however, be discounted.

How much reliance can be placed on the patients' statement regarding drug consumption can also be gauged from the urine strip test (Table 2). Of the 236 patients who claimed to have taken drugs the previous day, 86 % were telling the truth, as judged by the strip test. This percentage was more or less the same among patients who were punctual or otherwise.

There is some suggestion however, that it was somewhat lower in the third quarter of treatment.

Although detailed quarter-wise data for pill collection are not being presented, it is worth mentioning that a similar tendency was noticed in this respect too viz. excess drugs having been found most frequently in the third quarter.

Discussion

Default in drug intake during domiciliary treatment is generally believed to be one of the principal causes of treatment failure. At the same time, it is inevitable that in large scale schemes of domiciliary treatment patients should be trusted to collect and consume drugs as advised. It is the purpose of the present study to determine the reliability of assessing the regularity of drug intake by the regularity of drug collection. Analysis of the data collected during the course of the study shows that for patients who attend for drug collection

TABLE 2

*Delay in drug collection related to result of surprise urine test**

Delay in drug collection (Days)	1st Quarter		2nd Quarter		3rd Quarter		4th Quarter		Total	
	No. tested	Positive	No. tested	Positive	No. tested	Positive	No. tested	Positive	No. tested	Positive
0	43	39	28	25	22	19	29	25	122	108 (88%)
1	10	8	8	8	2	2	5	5	25	23 (92%)
2	3	2	8	7	4	4	6	6	21	19 (90%)
3	3	2	10	9	7	3	—	—	20	14
4—6	6	5	3	2	6	3	8	7	23	17
7—9	4	3	—	—	5	5	4	4	13	12
10—	1	1	3	3	3	3	5	4	12	11
Total	70	60	60	54	49	39	57	51	236	204 (86%)
		(86%)		(90%)		(80%)		(89%)		(86%)

*This table relates only to the 236 patients who stated that they had taken drugs the previous day

punctually or within three days of the due date, it is, by and large, safe to presume that they have been taking their drugs with reasonable regularity. Only in about 5% to 10% of such patients was there any evidence that they had been missing out on drugs and their regular attendance for drug collection could be misleading. Results of the urine strip test suggest that between 85% and 90% of the patients are telling the truth when they say that they have consumed the drugs on any day. There is also a suggestion, both from results of pill counting and the urine test that a some-

what larger proportion of patients tend to miss drugs in the third quarter of treatment.

In conclusion, one might also add a word of warning. The present study was carried out in an urban context from a centre which has been providing an adequate domiciliary service for over 40 years. The situation in other places, specially in rural or semi-urban areas with a comparatively lower standards of health consciousness may be entirely different. It would, therefore, be prudent to use these data with some caution and work out comparable figures for different situations.

A THYMIC HORMONE (THYMUSTIMULIN) IN PNEUMOLOGY

G. DADDI*, M. LUCCHESI*, P.A. MANCINI*, M. MATZEU* AND E. BALDONI**.

Summary: Thymus extract (Thymustimulin TP-I) prepared by Falchetti is a very active immunomodulating agent. It has been used successfully in various acute and chronic respiratory diseases as a therapeutic adjuvant as well as in the prevention of periodical relapses which usually occur in chronic broncho-pulmonary infections, especially during the cold months. Moreover, in some aged people with severe signs of mental decay, TP-I produced an astonishing recovery of some deteriorated properties of the nervous system.

Soon after the discovery of the anti-bacterial drugs, it appeared clearly that the administration of these drugs was not sufficient to overcome the infection always. To attain this aim, the defence system of the host was also necessary. Generally speaking, if there is a lack of general or local, specific or non-specific immunity even very active anti-bacterial agents may fail.

This is particularly true in pneumology. In fact, many acute or chronic respiratory infections are accompanied by a deficiency of T and B lymphocytes, of macrophages and even of neutrophils. This immunodeficiency may be either a predisposing factor or a consequence of the disease. This suggests the necessity for immunomodulation in cases of imbalance between host and the infecting agent.

Following this concept, years ago we started combining specific drugs with immunomodulating agents. At that time we tried to combine Levamisole with specific drugs obtaining unexpectedly good results in chronic pulmonary suppurations, and pulmonary mycoses. In sarcoidosis, Levamisole produced very remarkable improvement alone or in combination or alternation with corticosteroids.

In 1975 we began to use also a new immunomodulating agent, Thymustimulin (TP-1), obtained by purifying the extract from thymus of young calves by Falchetti in the laboratories of the Sero Institute, Rome.

Up to 1982 at least eight thymic hormones were described. It is possible that some of these are degradation products of others. According to Falchetti TP-1 belongs to a family of polypeptides with molecular weights lower than 12,000. Results reported in the literature indicate that TP-1 has a potent modulating action on the human immune system, both in vitro and in vivo. The beneficial effects of Thymustimulin are very important in bacterial infections, as well as in some severe virus diseases especially

if they develop in immunodeficient individuals (children, cancer patients). Probably Thymustimulin increases the cytotoxic activity of the lymphocytes on the virus infected cells. TP-1 had so far been used by several workers in various diseases connected with primary or secondary immunodeficiencies. We felt that TP-1 might give good results in infective respiratory disorders also.

Our experience, up to date, can be summed up as follows :

Tuberculosis : 25 patients, recent or chronic, all with hypoergy or anergy to tuberculin and all no more responsive to the most active specific drugs.

B) *Chronic broncho-pulmonary suppurations* : 1 patients with bilateral congenital cystic bronchiectasies.

C) *Long lasting respiratory infections* : 11 patients not responsive anymore to the usual antibacterial drugs.

D) *Chronic bronchitis* : 20 patients of whom 10 showed asthmatic syndrome and frequent relapses during the winter months.

E) *Extrinsic asthma* : 5 patients.

F) *Pulmonary mycoses* : 2 patients.

G) *Prevention of respiratory periodic ailments in geriatric cases* ; 12 patients.

H) *Aging patients with deficient mental faculties*

In all these patients addition of TP-1 to the specific but already ineffective therapy restored the immunological response, with beneficial effects on the course of the disease and achieved indisputable clinical improvement, reducing

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the duration of the illness and the need for hospitalisation.

Method of treatment. TP-1 with or without the indicated specific drugs in each case was generally administered in the dosage of 2 mg/kg/day for one week followed by the same dosage but given twice a week for 3 weeks. This monthly cycle was repeated at monthly intervals one or more times, especially in the autumn-winter seasons. The results have been as follows :

A) Pulmonary tuberculosis

The parameters adopted have been: cutaneous response to tuberculin (O.I, 0.5 and 1.0 units PPD) ; lymphocyte and macrophage activation in vitro with PHA and PPD; induction of rosette formation ; sputum conversion and clinical radiological response.

In all the 15 patients with *recent tuberculosis and immunodeficiency* treated with TP-1 as above, the immunoreactivity was restored after one month. Of the 12 control cases only 7 obtained analogous results in the same period.

Sputum conversion was quickly obtained in all the recent cases, whether they had received TP-1 or not.

Chronic tuberculosis : only 7 of the 11 patients showed a modest revival of the immunoreactivity after the start of treatment. However, it returned to the previous deficient levels in about 1 month after stopping the treatment. Only 7 patients converted in a few weeks; 3 more converted in 4 months and 1 patient remained positive. Even if the results were not as brilliant as in the case of recent tuberculosis, considering the kind of chronic patients in this group, TP-1 did have some beneficial effect in these almost hopeless cases. The clinical and radiological picture was also favourably influenced by TP-1. Particularly remarkable was the regression of the exudative character of the lesion, both in the recent and in the chronic patients.

B) Severe chronic suppurations

For at least 3½-years we followed 7 patients with congenital cystic bronchiectasis requiring repeated and long hospitalisations since childhood. In these patients the cell-mediated immunity was impaired and the serum IgG was increased, while the IgA was normal or slightly decreased. The administration of several monthly cycles of TP-1 associated with adequate antibacterial drugs resulted in appreciable reduction of the number and the duration of hospitalisations. In 6 cases, the cutaneous

tuberculin reactivity reverted from negative to positive, the sputum was reduced in quantity as well as in its pus content.

C) Long-lasting respiratory infections

This was a heterogeneous group of 11 patients, on an average more than 60 years old, suffering from long-lasting respiratory infections. The reactions for influenza A and B and adenovirus were positive in 6 patients; in 5 other patients Haem. Infl. was isolated from sputum. Anyway, the viral lesions of the respiratory mucosa paved the way to the pathogenic bacterial colonisation. The antibacterial treatment in accordance with the periodically repeated antibiograms remained unsuccessful for 7-8 weeks. At this point, TP-1 was administered and after only 1 week, the patients recovered to the point of being discharged from the hospital.

D) Chronic bronchitis

Ten patients (average age 65 years) were suffering from chronic bronchitis with asthmatic attacks and consequent respiratory difficulties during the winter. Even if treated every year (in autumn vaccinated against influenza and receiving courses of antibacterial therapy during the cold months) the patients continued to have relapses from time to time. In the last couple of years we added TP-1 in two consecutive monthly cycles (October and November). This immunostimulation gave good results as in the following 4 months only 3 patients caught respiratory virus infection with only slight symptoms of respiratory infections, probably bacterial, and a very limited functional insufficiency. They recovered in 7 days, without hospitalisation.

E) Extrinsic asthma not responsive to desensitization :

Five patients. Adding TP-1 to the specific allergen, desensitization could be carried out successfully.

F) Pulmonary mycoses

TP-1 treatment gave very good results in 1 case of pulmonary aspergillosis (5 cycles) and 1 case of candidiasis (3 cycles). The anti-aspergillus antibodies gradually disappeared. The fungi could no more be found in sputum and clinically, the patients could be considered as cured.

G) Prevention of periodical respiratory ailments in geriatric patients.

Twelve geriatric patients starting in October

received TP-1 in monotherapy. 1 mg/Kg/day for 1 week, thereafter twice a week for 2 months and then once a week up to 6 months. They had no serious respiratory infections during this period, whereas these were frequent in the controls hospitalised in the same wards, corroborating the effectiveness of TP-1 observed in aging mice.

H) *Recovery of lost or deficient mental activity in aging patients*

These geriatric patients had signs of senile degeneration of the nervous and vascular systems. TP-1 was administered not only as an immunomodulating factor but also to see if this hormone, obtained from a gland which is anatomically present only in the first years of life, could somehow favourably influence some psycho-organic ailments connected with aging. All the patients showed an indisputable recovery of their mental faculties in various degrees, as judged by neurological and psychological tests performed before, during and after TP-1 treatment.

It must be emphasised that TP-1 administration did not produce any serious side effect,

neither in the young nor in the aged patients and that the association with other drugs has been well tolerated in all diseases. Atopic patients allergic to cow's milk may have anaphylactic reaction at the first injection. Therefore, it is advisable to enquire if the patient had shown signs of abnormal reactivity or higher sensitivity to cow's milk proteins.

We are also treating patients of lung cancer with TP-1 since the usual treatment of this malady has so far given disappointing results.

There are, however, many problems, concerning this important substance and its properties, which require further investigations with a view to understand its action. Actually, the observations referred to above suggest that TP-1 may not only be a precious tool in the treatment of bacterial diseases of the lung but may, directly or indirectly, have unsuspected far reaching effects. The only drawback is its high cost. Nevertheless, acknowledging its great usefulness, our National Health Service has listed TP-1 among the drugs to be distributed free if required under a medical prescription for people entitled to state assistance even if they are not hospitalised.



SHORT-COURSE CHEMOTHERAPY OF PULMONARY TUBERCULOSIS—SECOND TUBERCULOSIS ASSOCIATION OF INDIA TRIAL

Research Committee of the Tuberculosis Association of India

Summary: Two short course regimens were studied in 175 patients. In one regimen, RMP, INH and PZA were given daily for the initial intensive phase of eight weeks. In the other SM was added during this phase. Patients whose sputum was converted by *direct smear* at 8 weeks were treated randomly with RMP and INH daily for a further 4 or 18 weeks in both regimens. Patients who continued to have a positive smear at 8 weeks were treated with RMP and INH daily for 18 weeks after the initial intensive phase of 8 weeks. Only 1 patient remained unconverted at the termination of chemotherapy. There was only one bacteriological reversion during at least 18 months of follow up after termination of chemotherapy among those treated for 26 weeks. Nearly one fourth of the patients had bacteriological reversion among those treated for 12 weeks only. All patients who harboured initially drug resistant bacilli were converted if their treatment was for 26 weeks and there was no relapse among these.

The first Short-course Chemotherapy (SCC) Trial of the Association was carried out in 1974-78. Two daily regimens were tried, viz. Rifampicin (RMP) plus INH plus Streptomycin (SM) plus Ethambutol (EMB) and Pyrazinamide (PZA) plus INH plus SM plus EMB. In both SCC regimens, the duration of chemotherapy was 20 weeks followed by a placebo for 60 weeks. The cases in the control regimen were treated with INH and SM for the first 8 weeks followed by INH and Thiacetazone daily in standard doses of 72 weeks, making the total duration of treatment 80 weeks in this regimen. Although the sputum conversion was nearly 100% in all regimens, cumulative relapse rates at the end of 112 weeks were 16%, 32%, and 11 % respectively. The difference between RMP and PZA regimens was statistically significant but it was not significant between RMP and control regimen. This trial showed that PZA could not replace RMP and the duration of SCC regimen in this trial viz. 20 weeks was not enough for the type of cases included in the trial. Another important finding of that trial was that the relapses were much more frequent amongst those whose sputum took longer than 8 weeks to convert.

Based on these findings and also the desirability of reducing the cost of drugs as far as possible, the Second Trial was planned. EMB was omitted altogether since studies elsewhere had shown that this drug had practically no role in SCC if at least three bactericidal drugs were used.

Methods and Material

The two regimens that were tried were as follows :-

Regimen A

RMP+INH+PZA daily for 8 weeks.

Those who were sputum negative by direct smear at 8 weeks were randomly allocated into two sub-groups:

Group A₁ RMP+INH daily for 4 weeks followed by placebo for 14 weeks.

Group A₂ RMP+INH daily for 18 weeks.

Those who were still positive by direct smear at 8 weeks were continued on RMP+INH daily to complete 26 weeks' total treatment.

Regimen B

SM was given daily for the first 8 weeks in addition to RMP+INH+PZA. Other particulars of the regimen and the sub-groups were exactly the same as for Regimen A.

All drugs were administered daily in the following doses:

RMP 450 mgs if the weight was below 50 kgs and 600 mgs for those with the weight 50 kgs and above.

PZA 1500 and 2000 respectively. SM 0.75 gm

INH 400 mgs.

Patients included in the trial had to fulfil the following criteria:

1. They should be between 15 and 45 years of age.

*This report was compiled by Dr. S.P. Pamra, Hony. Technical Adviser of the Tuberculosis Association of India on behalf of its Research Committee, which, then, consisted of late Dr. R. Viswanathan, Dr. H.B. Dingley, Dr. M.M. Singh and the author of the report.

2. They should be residents of the city and there should be a reasonable chance of their continuing to stay in the city for at least 1½ years.
3. They should have had no or less than 10 days' anti-TB treatment previously.
4. Their sputum must have been positive for A.F.B. at least twice by direct smear.
5. Extent of disease should not be more than 3 lung zones.
6. They should be willing for injection or any other treatment which is prescribed for them.

Patients falling in the categories mentioned below were ineligible for inclusion in the study:

Moribund patients.

Patients having pleural effusion obscuring more than 1/3rd of one lung field. Patients suffering from any tuberculous or non tuberculous complications e.g. diabetes, extrapulmonary tuberculosis, etc. likely to interfere with management of the disease.

Patients known to be pregnant at the start of the study.

Patients whose weight was less than 35 kg-

During the course of treatment, two specimens of sputum were examined at 4,8,12,16,20 and 26 weeks. All specimens of sputum were put up for culture. Sensitivity tests for the 4 drugs used in the trial were carried out on all positive cultures. Culture and sensitivity testing

was carried out centrally in the laboratory of the New Delhi TB Centre for all patients included in the trial. X-ray examination was carried out at 8,12 and 26 weeks.

During the follow-up period, x-ray chest was to be carried out at 3,6 and 12 months and sputum examination at 3,6,9 and 12 months. These examinations were to be repeated if the patient attended with symptoms at any time in the interval between the routine checks as per schedule.

Patients could be withdrawn from the study only in case of major toxic reaction or intolerance to any drug. However, replacement of streptomycin by PAS was permissible in case of SM toxicity.

The study was carried out simultaneously from four institutions in Delhi viz. New Delhi TB Centre, L.R.S. TB Hospital, Mehrauli, R.B. TB Hospital, Kingsway and V.P. Chest Institute. The trial was supervised by the Research Committee and the Director of the New Delhi TB Centre coordinated the trial. Statistical officer of the New Delhi TB Centre was responsible for collecting and analysing the data. The intake into the trial lasted from January 1980 to January, 1982. All patients were hospitalised during the course of treatment.

Results

Table 1 shows that 175 patients in all were inducted into the trial. Thirty three cases have

TABLE 1

Patients included in the Study

	A	B	Total
Total cases inducted	89	86	175
Exclusions			
Initial culture negative	8	4	12
Initial drug resistance	4	9	13
Protocol infringement	3	—	3
Initial defaulters	—	5	5
Total exclusions	15	18	33
Included in main analysis	74	68	142

been excluded from the main analysis, mostly because of initial drug resistance or the pre-treatment culture being negative.

Two patients in Group B had to be withdrawn from the trial because of major intolerance. One patient developed jaundice within the first 4 weeks and the other severe cutaneous reaction between the 4th and the 8th week. There was no death. Thus 140 patients, 74 in Regimen A and 66 in Regimen B, were left for analysis,

Table 2, shows age and sex distribution and Table 3 the extent of disease and cavitary status of the patients included in the trial. It would be seen that the two groups were, by

and large, comparable in respect of these parameters,

Table 4 shows the results of sputum conversion at 4 and 8 weeks. It would be seen that the conversion rate of sputum was higher in group B than in Group A at 4 weeks, though the difference just failed to attain statistical significance. However, at 8 weeks there was no difference between the two regimens. A good few cases were smear positive but culture negative at 4 and 8 weeks, which is the usual feature of these regimens. This phenomenon persisted upto 12 weeks but thereafter there was hardly any smear positive but culture negative case.

TABLE 2

Age-sex distribution of patients (Percentages)

	A	B	Total
Males	75	70	73
Females	25	30	27
16—25 years	70	61	66
26—35 years	17	30	23
36—45 years	13	9	11

TABLE 3

Extent of Initial Disease (Percentages)

		A	B
Extent of Disease	1 Zone	11	9
	2 Zones	63	71
	3 Zones	26	20
Unilateral Disease		54	53
Bilateral Disease		46	47
Extent of Cavitation	Nil	30	27
	Single	58	56
	Multiple	12	17

TABLE 4

*Sputum Conversion at 4 & 8 weeks*A
B

		A		B	
		4 Weeks	8 Weeks	4 Weeks	8 Weeks
Number Assessed		74	73	66	65
Smear	No.	45	65	50	57
Negative	%	61	89	76	88
Culture	No.	56	71	56	63
Negative	%	76	97	85	97

TABLE 5

Bacteriological status at 26 weeks of patients who were smear positive at 8 weeks

	Total Patients	26 weeks	
		No. Assessed	Number Unconverted
A	8	6	1
B	8	6	0

As mentioned earlier, patients who were smear positive at 8 weeks were not randomised into two sub-groups for each regimen but were continued on RMP and 1NH daily for a further period of 18 weeks. All of them were converted by the 26th week of treatment except one case in Group A (Table 5). Sputum conversion at the end of chemotherapy in all other patients (i.e. sub-groups A₁ and B₁ at 12 weeks and A₂ and B₂ at 26 weeks) was also 100%.

Table 6 shows the radiological results at the end of 26 weeks among the patients whose skiagrams were available and who completed 26 weeks' observation period. The two groups, again, were more or less comparable in respect of the radiological changes. Radiological worsening was noted only in groups A₂ and B_X where the drugs were stopped after 12 weeks. Cavity closure was obtained in 75% on the whole.

Since treatment after 12 weeks was different in sub-groups A_x and B_x as compared to sub-groups A₂ and B₂, bacteriological reversions between 12 and 26 weeks are shown separately for the 4 sub-groups. It would be seen that there was no reversion in sub-groups A₂ and B₂ who were still taking drugs during this period but in sub-groups A_x and B₁ where the drugs were stopped at 12 weeks, there were 6.4% and 14.3% reversions (Table 7).

Table 8 shows the cumulative bacteriological reversions upto the end of 52 weeks i.e. a follow-up period of 26 weeks for sub-groups A₂ and B₂ and 40 weeks for sub-groups A₁ and B₁. Again, there were no bacteriological reversions in sub-groups A₂ and B₂ but a few more cases had reverted in sub-groups A₁ and B_x and the cumulative bacteriological reversions were 25.0% and 22.7% respectively.

At the end of follow up i.e. 104 weeks from

TABLE 6

Radiological changes 0—26 weeks

	Number Assessed	Radiological Changes				Cavity Closure %
		Marked Improvement	Slight Improvement	No Change	Worse	
A ₁	29	66	28	3	3	80
A ₂	37	76	16	8	0	63
B ₁	27	74	4	4	18	74
E ₂	33	88	9	3	0	85

TABLE 7

Bacteriological Reversions 12—26 weeks

	A ₁	A ₂	B ₁	B ₂
Number Assessed	31	37	28	34
Bacteriological No.	2	—	4	—
Reversions %	6.4	— 0.0	14.3	0.0

TABLE 8

Bacteriological Reversions 12—52 weeks

	A ₁	A ₂	B ₁	B ₁
Number Assessed at 52 weeks	24	30	22	28
Bacteriological No.	6	—	5	—
Reversions %	25.0	0.0	22.7	0.0

the start of treatment, one case relapsed in subgroup A₂ and one more relapsed in subgroup B_x (Table 9) giving a cumulative relapse rate of 27%, 4%, 30% and 0% in 104 weeks in subgroups A_{1s}, A₂, B_x & B₂ respectively. Thus, there was only one relapse amongst those treated for 26 weeks as against six each in streptomycin and non-streptomycin regimen

of 12 weeks' duration, during a follow up period of at least 18 months after completing the chemotherapy. It is obvious that patients who had chemotherapy only for 12 weeks fared much worse than those who were treated for 6 months. There was only one bacteriological reversion in the latter group.

TABLE 9

Bacteriological Reversions 12—104 weeks

		A ₁	A ₂	B ₁	B ₂
Number assessed					
at 104 weeks		22	25	30	25
Bacteriological	No.	6	1	6	—
Reversions	%	27.3	4.0	30.0	0

TABLE 10

Sensitivity Status At time of Bacteriological Reversion

	A ₁	A ₂	B ₁	B ₂
Sensitive to all	1	—	5	—
Resistant to H	2	1	—	—
Resistant to H,Z	1	—	—	—
Only Smear Positive	2	—	1	—
Total	6	1	6	—

In addition to the bacteriological reversions, there were 5 cases where there was a marked radiological worsening unaccompanied by bacteriological reversion. Of these 5, 2 were in sub-group B₁ and one each in the other three sub-groups.

Table 10 shows the sensitivity pattern at the time of bacteriological reversion in 10 out of 13 cases whose sensitivity results were available. It would be seen that the bacilli were sensitive to all the drugs in 5 reversions in the streptomycin group whereas in the non-streptomycin A₁ Group, the bacilli were sensitive to all drugs in only one out of 4 reversions. Two were resistant to INH alone and one resistant to INH and Pyrazinamide.

Table 11 shows the pattern of initial resistance in 12 out of 13 cases whose subsequent fate was known. While 5 were resistant to one drug only, 6 were resistant to 2 drugs and one resistant to S, H and Z. None of the strains was resistant to R.

Table 12 shows that 11 of these 12 were

converted after 12 weeks' treatment and the remaining one was also converted before chemotherapy was completed. Here again there was no relapse till the end of follow up in sub-groups A₂ and B₂ while 4 out of the 5 who were treated only for 12 weeks reverted.

Discussion

The object of the chemotherapy trials being conducted by the Tuberculosis Association of India is to find a short course chemotherapy regimen which would be highly effective, acceptable, economical and capable of being adopted under programme conditions. The four-drug regimens tried in the first study were found wanting in efficiency. Rifampicin, Pyrazinamide and INH regimen tried in this study gave virtually 100% sputum conversion without any relapse in 18 months' follow-up after completion of 6 months' chemotherapy. Since most of the relapses after short course therapy usually occur in the first six months of follow up, it virtually means that there are no relapses with this regimen.

TABLE 11

Pattern of Initial Drug Resistance

Initial Drug Resistance to	A ₁	A ₂	B ₁	B ₂	Total
H	2	1	—	1	4
S	—	—	—	1	1
S, H	—	—	3	2	5
H, Z	—	1	—	—	1
S, H, Z	—	—	1	—	1
Total					

TABLE 12

Initially Drug Resistant Cases: Sputum Conversion at 12 weeks and subsequent reversion upto 104 weeks

	A ₁	A ₂	B ₁	B ₂	Total
Total cases	2	2	4	4	12
Sputum Negative at 12 weeks	2	1*	4	4	11
}				2	9
}		—	3	—	4

*The remaining 1 case was converted at 26 weeks and stayed sputum negative upto 104 weeks.

Addition of streptomycin to the three drugs in the initial intensive phase of 8 weeks (which can raise organisational problems at the peripheral health centres) did not lead to any material advantage. Although the sputum conversion in the first four weeks was a little quicker with the addition of streptomycin, the advantage was completely neutralised by the 8th week. Further, the bacilli in relapse cases were sensitive to all the drugs in the streptomycin group whereas only in 1 out of the 4 relapses in the non-streptomycin group were sensitive to all the drugs at the time of bacteriological reversion. This advantage, too, is merely academic because all relapses were amongst those who were treated for 12 weeks (a regimen which is not recommended)

and none of the cases who had 26 weeks treatment (which is recommended) relapsed.

The adverse reactions in this regimen were also minimal. Only 2 cases had to be withdrawn because of severe reaction and the minor reactions in the other cases could be easily overcome without in any way interfering with the regimen.

The regimen also should be suitable for treatment under field conditions. In a large majority of the treatment centres, culture and sensitivity facilities are not available. The study has shown that the regimen is equally effective in patients excreting initial drug resistant bacilli as in the case of those with

fully sensitive bacilli, thus making sensitivity testing unnecessary, whatever the level of initial resistance. Randomisation was based on smear examination rather than culture intentionally, since culture facilities are not present everywhere. The study has shown that (contrary to the impression of the 1st trial) even if the sputum is converted in 8 weeks, three months' treatment is inadequate.

It must however be mentioned that all patients in the study were hospitalised while on chemotherapy, i.e. the treatment was fully supervised. Such a supervision would not be possible under field conditions. Whether the results would have been equally satisfactory if drugs were self-administered is difficult to say. Realising that full supervision in daily regimens is not possible, the Tuberculosis Association of India is conducting another trial in rive centres in the country where the drugs are administered intermittently in the maintenance phase after a short initial daily phase. The results of this trial are still awaited.

The other handicap of this regimen is its' high cost. Although the cost of rifampicin has come down recently, unfortunately the cost of Pyrazinamide has gone up with the result that this regimen still remains very costly and difficult to adopt for free treatment to all patients under the "National Programme. Even though a part of the additional cost of drugs can be compensated by increased compliance by the patient, lesser work-load on the treatment centres and lower relapse rate, it may still be too costly for free treatment of all patients under the National Programme. Thus, the search for a really economical short-course chemotherapy regimen is still necessary. The Tuberculosis Association of India has started

another trial where treatment in the maintenance phase consists of INH and Thiacetazone for about 6 months preceded by a daily intensive phase of 2 months of rifampicin, pyrazinamide and INH. This regimen, if it proves equally successful, will certainly cut down the cost and would be suitable for adoption as the standard treatment xinder the National Programme.

For the present, it seems that 6 months treatment with rifampicin, pyrazinamide and INH for 2 months followed by rifampicin and INH for 4 months is satisfactory for a previously untreated sputum positive case, if economically feasible, since it gives virtually 100 % conversion in patients with initially sensitive or resistant bacilli and there are no relapses at least for 18 months after completion of chemotherapy.

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Excerpts from Presidential Address of Dr. S. Sivaraman

The performance under the National Tuberculosis Programme has been below expectations mainly because of human frailties such as health workers assigning low priority to the programme and non-involvement of the community in addition to inadequate resources and PHIs being few and far between. The NTP has yet to be introduced in 50 districts of the country.

2. Anti-TB drugs should be readily available in adequate quantities in all treatment centres. These should be supplied directly to the state tuberculosis officers for distribution to the various DTCs in the State.
 3. A good network of multipurpose laboratories with central specialized laboratories at DTCs is essential for primary health care in respect of tuberculosis if the target of "Health for all by 2000 A.D" is to be achieved.
 4. The Ministry of Health should prepare a comprehensive manual for the guidance of all those engaged in tuberculosis programme. These manuals must be frequently revised and updated in the light of actual working experience in the field.
 5. Teaching of tuberculosis at the under-graduate level should be in tune with the requirements of NTP. Frequent refresher courses should be arranged for general practitioners.
 6. Finding of unknown infectious cases in the community should be given top priority with a view to reduce fresh infections and thereby disease in children. Wide publicity should be given to the preventive value of BCG vaccination.
 7. No reliable statistics are available in respect of prevalence of non-tuberculous respiratory diseases in the country. This lacuna should be removed.
 8. Effective anti-smoking and anti-air pollution measures should be rigorously introduced. There should be wide publicity about the hazards of smoking and air pollution.
 9. Tuberculosis Associations should step up their activities. Fund collection through the TB Seal sale should be improved. Special events such as national cycle race should be organized periodically for the same purpose as is being done by the Japan Tuberculosis Association. The weaker associations must be strengthened.
 10. The entire community including health workers must realize that tuberculosis needs the strategy of a well-planned war. At present we seem to be fighting a losing battle. The fight has therefore to be intensified and the strategy revamped.
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Summaries of the Papers presented at the 38th National Conference on Tuberculosis & Chest Diseases at Panaji from 27th to 30th October, 1983.

SHORT-COURSE CHEMOTHERAPY OF PULMONARY TUBERCULOSIS—SECOND TUBERCULOSIS ASSOCIATION OF INDIA TRIAL

Research Committee of the Tuberculosis Association of India

(Paper published in full in this issue)

INTERMITTENT SHORT-COURSE CHEMOTHERAPY IN PULMONARY TUBERCULOSIS—THIRD MADRAS STUDY OF SHORT-COURSE CHEMOTHERAPY

M.S. JAWAHAR

(Paper not received).

SHORT-COURSE CHEMOTHERAPY—INDIAN RAILWAYS

S.C. KAPOOR

The Indian Railways decided to introduce short-course chemotherapy for pulmonary tuberculosis amongst the staff and families of the railway employees through the various chest clinics on all the railways. The regimen recommended to the chest clinics by the task force was Rifampicin, INH, Streptomycin and Pyrazinamide thrice weekly for 2 months followed by the same four drugs twice weekly for 5 months. Some clinics however departed from this regimen and some cases were treated with daily regimens. The results of treatment of 945 patients (out of which 59 were sputum negative initially) were presented. Taking all regimens together, sputum conversion was 99 %, most of the patients having been converted after 2 months' treatment. The relapse rate amongst those who completed one year's follow-up was 11 % in the recommended intermittent regimen and about 3% in the daily regimen. The patient's compliance was less than 50% in 15%. Only about 2/3rds of the patients took drugs with a regularity of 90% or above in the intermittent regimen.

SHORT-COURSE CHEMOTHERAPY UNDER SERVICE CONDITIONS

S.S. VIRDI *et al*

The results of short-course chemotherapy of 351 patients of active pulmonary tuberculosis are reported. The patients were given Rifampicin, INH, Streptomycin and Thiacetazone daily for the first 8 weeks followed by rifampicin and INH bi-weekly for further 16-18 weeks. Most of the cases were between 15-34 years in age and males. 54 patients had in addition tuberculous lesions in some other organ. 266 were sputum positive by direct smear and/or culture. 41 % sputum positive patients completed 26 weeks treatment regularly. The regularity amongst sputum negative patients was 56 %. Sputum conversion was 87 % both amongst fresh cases as well as those who were previously treated. Relapse rate during 6 months following completion of treatment was 2 % amongst fresh cases and 5 % amongst previously treated cases. Out of 85 initially sputum negative cases, 48 completed 26 weeks treatment and of these 39 showed considerable radiological improvement.

A CLINICAL TRIAL OF SHORT-TERM (6 MONTHS) REGIMEN OF CHEMOTHERAPY FOR THE TREATMENT OF PULMONARY TUBERCULOSIS

D. BABU RAO

Forty six bacteriologically confirmed cases of pulmonary tuberculosis with moderate and extensive disease were treated with Rifampicin, INH, Pyrazinamide and Streptomycin daily for.

2 months as indoor patients followed by INH and Thiacetazone daily for 4 months as out-patients. One patient failed to convert at the end of treatment and 3 cases relapsed during the first 12 months after completing the treatment.

CLINICAL STUDY OF TREATMENT FAILURES WITH RESERVE DRUGS UNDER PROGRAMME CONDITIONS OF 247 CASES SINCE 1976

S. SATYA SRI

To hundred and forty seven sputum positive failure cases who had had treatment for 6 months or more with INH, Streptomycin and Thiacetazone were treated with INH along with two other drugs out of Rifampicin, Pyrazinamide, Ethambutol and Ethionamide on domiciliary basis. The total duration of treatment was 12-18 months. 163 patients were males, 84 females and most of them were in the age group 26-45 years. Sensitivity studies were not available but most of them had shown clinical and radiological deterioration during the previous treatment. 122 patients completed one year's treatment. Sputum conversion was obtained in 127 patients, out of whom 25 relapsed after stopping the treatment. 4 patients developed vision defects, 4 hepatitis and 30 arthralgia.

INCIDENCE OF DIABETES MELLITUS AMONG PULMONARY TUBERCULOSIS PATIENTS

N.K. JAIN *et al.*

Two hundred and thirty patients of pulmonary tuberculosis were subjected to oral glucose tolerance test. Diabetes was found in 7% of the patients and impaired glucose tolerance in about 11%. The rate was higher in patients above 40 years and much more in males than females. Frequency of impaired glucose tolerance was more amongst patients on Rifampicin containing regimens.

DIABETES AND TUBERCULOSIS

P.A. DESHMUKH

(Full paper will be published in a subsequent issue)

IMPAIRED GLUCOSE TOLERANCE IN ACTIVE PULMONARY TUBERCULOSIS

S.K. BISWAS *et al.*

(Full paper will be published in a subsequent issue)

DIABETES AND PULMONARY TUBERCULOSIS—A PROSPECTIVE STUDY

S.R. TRIPATHY *et al.*

(Full paper will be published in a subsequent issue)

A PROFILE OF PULMONARY TUBERCULOSIS WITH DIABETES MELLITUS

S.R. ROY *et al.*

Five thousand and twenty four cases of pulmonary tuberculosis who attended the Kharagpur Chest Clinic from 1.1.76 to 31.12.82 were studied. Blood sugar examination was carried out in 1762 patients who were either 40 years or more in age or whose age was less than 40 years but either their response to chemotherapy was poor or they had radiological appearance suggestive of diabetes. 83 of them were found to have diabetes. Only about 30% of them were already known. Usually the extent of the tuberculous lesions was directly proportionate to the severity of diabetes. There was no case of typical juvenile diabetes.

PULMONARY TB AND DIABETES—RADIOLOGICAL CONSIDERATION—AN ANALYSIS BASED ON 25 YEARS' EXPERIENCE

A.L. ANAND

During the period 1955 to 1979, 400 cases of Diabetes were seen in Tuberculosis Research

Centre, Amargadh. Three hundred of them were known diabetics and in 100, diagnosis of tuberculosis and diabetes was made simultaneously. In no case did diabetes develop after the diagnosis of tuberculosis was made. The duration of diabetes before the diagnosis of pulmonary tuberculosis varied from 4 months to 10 years. Diabetes was mild in 50 cases, moderate in 160 and severe in 190 cases. Ketosis was present in 70 cases with or without coma. In 20 % of the cases the lung lesion was in the lower lobe. Pleurisy with effusion was infrequent and none of the cases had any extrapulmonary lesions in addition. The lung lesions were more often exudative and more extensive if the diabetes was not well-controlled.

DAMP HOUSE—A CAUSE OF NOCTURNAL ATTACK OF BRONCHIAL ASTHMA

M.S. AGNIHOTRI *et al*

Twenty five patients of allergic bronchial asthma living in damp rooms were studied. Eighteen were below 36 years in age; 84 % had attacks at night; 60 % gave a history of allergic disease in some other member of the family and 76 % had associated lesions of allergic origin elsewhere. Colony counts of *Aspergillus* were carried out in the bedroom and general atmosphere. *A. Niger*, *A. Fumigatus* and *A. Flavus* had higher colony count in bed rooms but *A. Versicolor* had higher colony count in the atmosphere. Correlation of colony count with skin test, bronchial provocation test and precipitin test was carried out. It was concluded that fungi growing on damp walls are of aetiological significance in patients who had asthmatic attacks at night.

A THYMIC HORMONE (THYMUSTIMULIN) IN PNEUMOLOGY

G. DADDI

(Paper published in full in this issue)

PLEURAL BIOPSY IN PLEURAL EFFUSION OF UNDIAGNOSED AETIOLOGY

P. BAHADUR *et al*

Pleural biopsy was carried out with Abram's needle in 92 cases of pleural effusion of undiagnosed aetiology. Biopsy yielded adequate tissue in 90 cases. Specific diagnosis was possible in 71 cases viz. tuberculosis 47, malignancy 8, acute inflammation 16, chronic non-specific inflammation in 19. There were no complications of biopsy. In 40 cases the biopsy helped to correct the clinical impression.

OBSERVATIONS ON AETIOLOGICAL ASPECT OF PLEURAL EFFUSION WITH SPECIAL REFERENCE TO PLEURAL BIOPSY

B.K. DASH *et al*

Pleural biopsy with Abram's needle was carried out in 100 adults with pleural effusion. In 7 cases the effusion was minimal. In 89 % the fluid was exudate. In 17 the fluid was positive for AFB by direct smear. In 5 cases malignant cells were found in the fluid. Biopsy showed that 31 cases were tuberculous 5 of malignancy, 49 of non-specific inflammation or fibrosis. In one case the pathology could not be established and in 4 the pleural showed no evidence of disease. Out of 16 haemorrhagic effusions, 11 were malignant and 2 tuberculous. Out of the 54 tuberculous effusions culture of the fluid was positive in 8 cases. Fifty four effusions in all were tuberculous out of which 49 were serous.

TUBERCULOSIS TRENDS IN AN URBAN COMMUNITY IN DELHI NEW DELHI TB CENTRE

The New Delhi Tuberculosis Centre has a population of about 30,000 in the old city of Delhi under surveillance since 1962 to study the trends of pulmonary tuberculosis. Seven surveys covering the population above 5 years of age have been carried out to collect epidemiological data. A coverage of over 90 % was obtained in all surveys. No significant changes have been noticed either in the prevalence or incidence of disease during this period. The prevalence of active disease has stayed at around 10-15 per 1000 (about 4 per 1000 of these being bacteriologically positive). The incidence of fresh disease has been around 4 per 1000 per year, about 1 per 1000 being bacillary. The only noticeable changes have been (i) a lower prevalence of disease among females as compared to males,

and (ii) a suggestion that primary disease in the younger age groups may be on the decline. According to experience in western countries, these indices may be regarded as precursors of a decline in tuberculosis morbidity.

STUDY ON CHANGES OF TUBERCULOUS INFECTION RATES IN RURAL COMMUNITY IN BANGALORE DISTRICT AND THE INFLUENCE OF PROPORTION OF BCG VACCINATED CHILDREN ON THE PREVALENCE RATES OF INFECTION AMONG UN-VACCINATED CHILDREN

A.G. KURTHKOTI *et al*

Ninety villages with a population of 44,679 in 1979 as against 42,343 in 1974-75 have been surveyed. 12,907 and 12,535 were in the age group 0-9 years respectively. The response group was 92 % in the age group 0-4 years, 61 % in the age group 5-9 years and 76 % in the age group 0-9 years. The BCG scar rate among children in the age group 0-4, 5-9 and 0-9 years was 8 %, 39 % and 24 % respectively at the second survey as against 36 %, 64 % and 50 % at the first survey. The prevalence rate of infection however has not changed in the age group 0-4 years but there is an increase in the age-group 5-9 years. No definite reason can be given for this increase. A number of possibilities are discussed.

EFFECT OF SOCIO-ECONOMIC FACTORS ON THE INFECTIVITY RATE OF TUBERCULOSIS IN THE VALLEY OF KASHMIR

N. DHAR *et al*

Tuberculin testing was carried out in a random sample of 1711 in Kashmir Valley. 54 % of the sample was from urban areas. Tuberculin test was positive (reaction of 10 mm or more to 1 TU PPD RT 23) in 39 % and 47 % respectively in the males and females in the urban population. The respective rates in the rural areas were 38 % and 46 %. Overall infection rate was 41.5 % ;38.22 in males and 47.23 in females. The differences between Hindus and Muslims and between/various economic groups were not significant. Those with a tuberculin reaction of 15mm or more were subjected to further investigations and 37. cases of active disease were found amongst them.

TREND OF TUBERCULOSIS IN RURAL AND URBAN AREAS IN WEST BENGAL

G.C. NANDY *et al*

The records for 20 years of the Central Board for Hospital admissions set up by the Government of West Bengal have been reviewed. Whereas the percentage of admissions of patients from urban areas has been falling, the same has been rising for the rural areas. The percentage of males has been rising and that of the females has been falling. The percentage of sputum positive patients has remained more or less the same. The exudative lesions among new admissions are becoming lesser but the proportion of cavitory and miliary lesions has remained unchanged.

CORRELATION OF PULMONARY FUNCTION STUDY WITH RADIOLOGICAL EXTENT OF LESIONS IN CASES OF PULMONARY TUBERCULOSIS

K.C. MOHANTY *et al*

Forty eight Patients of pulmonary tuberculosis attending the Tuberculosis and Chest Diseases Department of J.J. Hospital, Bombay were studied. They were 16 to 60 years in age and had had treatment for 1 to 6 months. Patients on steroids and bronchodilators and those with any other associated disease were excluded. There were 37 males and 11 females. Majority of the patients were in the age group 22-24 years. Among non-smokers with involvement upto 3 lung zones, 57% had either pure or predominant restrictive abnormality. In 6%, abnormality was equally obstructive and restrictive. Amongst those with 4-6lung zones involvement, 15% had pure or predominant restrictive abnormality. But none had obstructive abnormality. Among smokers with lesions upto 3 lung zones, 53 % had purely restrictive abnormality, 7% had equal obstructive and restrictive abnormality. The percentages among those having 4-6 lung zones were 20 % restrictive and 7% obstructive abnormality.

**ORCADIAN PERIODICITY (DIURNAL-VARIATION) OF SERUM HISTAMINASE
ACTIVITY AND ABSOLUTE EOSINOPHIL COUNT IN TROPICAL PULMONARY
EOSINOPHILIA**

R.K. NARANG *et al*

Twentyfive cases of Tropical Pulmonary Eosinophilia (TPE) and 9 healthy controls were studied. Blood samples from each subject were collected at 8 A.M., 2 P.M., 8 P.M. and 2 A.M., Serum histaminase activity (SHA) and absolute eosinophil count (AEC) were determined. No patient had received any drug during the preceding week. Patients with any other concomitant illness were excluded. In the control group, SHA showed some diurnal change but circadian rhythm did not change significantly. TPE patients with predominantly late evening worsening of symptoms (12 in number) showed marked diurnal rhythm both of SHA and AEC. SHA activity was significantly raised in cases of TPA with predominantly early morning worsening of symptoms (13 in number), but no significant rhythm was found. In the former group SHA attained its peak in the late evening hours when symptoms were worst with a similar trend in the latter group. This suggests a definite role of immediate type of hypersensitivity in the production of symptoms. No correlation of AEC and symptoms was found in both groups of patients.

**EXPIRATORY FLOW RATE STUDIES BEFORE AND AFTER TREATMENT IN TROPICAL
EOSINOPHILIA**

S.N. TRIPATHY *et al*

Two hundred cases with absolute Eosinophil count (AEC) of 2000 cmm. or more attending the chest department of Burla Medical College from January 82 to March 83 were studied. They were above 14 years in age without past or present history of any respiratory or cardio-pulmonary disease. PEER was determined by Wrights' peak flow meter. PEER was low before treatment in all patients. It improved in all cases after clinical cure but in about 2/3rd of the cases PEER did not return to the predicted values. This irreversibility seems to be related to the duration of illness.

USE OF BOTRAPASE IN THE CONTROL OF HAEMOPTYSIS

D. LAWANDE *et al*

Twentyfive indoor patients of haemoptysis in Goa Chest Hospital were treated with Botrapase (1 ml intravenous 8 hourly). In 25 other patients conventional haemostatic drugs were given and there were 24 control cases which were not given any Botrapase or haemostatic drugs. Botrapase reduced the average days of haemoptysis by about 40% which is highly significant. On the other hand, the conventional haemostatic drugs did not reduce the period significantly.

**ACTIVE CASE-FINDING IN TUBERCULOSIS AS A COMPONENT OF PRIMARY
HEALTH CARE**

K.S. ANEJA

(Paper published in full in this issue)

**A STUDY TO DETERMINE THE RELIABILITY OF ASSESSING THE REGULARITY OF
SELF-ADMINISTRATION OF DRUGS AT HOME BY PATIENTS' ATTENDANCE
AT THE CLINIC**

New Delhi TB Centre

(Paper published in full in this issue)

**RELATIONSHIPS BETWEEN DRUG COLLECTION AND DRUG CONSUMPTION IN
SHORT-COURSE CHEMOTHERAPY**

M.L. MEHROTRA *et al*

Indirect methods of assessment e.g. result of treatment, physicians' impression, patients' impression, interview of the patient, pill count and medication monitor were used to study the

degree of compliance by patients and the relationship between drug collection and drug consumption. The results of the study showed very high relationship between drug collection and drug consumption.

ROLE OF MULTI-PURPOSE HEALTH WORKERS, HEALTH GUIDES, ETC. AND THEIR IMPACT ON THE PROGRAMME

S.C. KHASGIWALA *et al*

A house-to-house survey to detect hidden cases and to know the fate of drug defaulters in the rural areas of Baroda district was built in a programme of BCG vaccination. Two survey teams were used for each PHC. One team consisted of a multi-purpose TB supervisor, a multi-purpose health worker and a community health volunteer. The other team consisted of a sector supervisor, an A.N.M. and one community health volunteer. 143 villages with 31,540 houses and a population of 217,306 were surveyed in 24 days. 878 persons who had stopped treatment prematurely during the last 10 years were located. Of these, 260 had died, 107 had migrated out of the area and 511 were contacted. Of these, 186 still had symptoms pertaining to the chest, 23 were found sputum positive and 37 of these were taking treatment elsewhere. The authors conclude that multi-purpose health workers can be used for follow-up of defaulter patients and possibly for distribution of drugs.

STUDY OF DRUG COLLECTIONS IN INDUSTRIAL WORKERS AND THEIR FAMILIES

UMA JHINGAN *et al*

Two thousand nine hundred and thirty six patients put on treatment between 1976 and 1980 were analysed. 76.4% patients completed the treatment successfully. 73 % could be considered as regular in drug collection. The most common cause of drug default was absence of the patient from the town. Since majority of the workers come from villages, they have a tendency to go back home frequently leading to drug default. Drinking, negligence and superstition were responsible for drug default in 10-15% of the patients inspite of repeated motivation.

PRIMARY CARCINOMA OF THE LUNG: A REVIEW OF 30 CASES

G.S. PERHAR *et al*

Thirty patients of histologically proved bronchogenic carcinoma attending TN Medical College and B. Y.L. Nair Hospital were studied. Only 17 of these were diagnosed at the time of first admission. In the remaining 13 diagnosis was established after an interval of 2-16 months. Sputum cytology was carried out in 20 cases and was positive in 9. Bronchoscopy was possible in 21 and yielded a positive diagnosis in 10. In some cases the diagnosis was missed because early partial clearing of the lesion was responsible for stopping observation. In some young patients, malignancy was not suspected because of past history of tuberculosis and a positive sputum.

CANCER LUNG—SOCIO-MEDICAL FOLLOW-UP

S.G. VAIDYA *et al*

From May 1977 to April, 1983, 2070 patients were suspected to have cancer lung. The diagnosis was established in 148 patients; 123 out of 1154 males and 55 out of 916 females. 75 % of the cancer patients came from rural areas. 105 males and 12 females were smokers. Only 35 % of the patients could avail of the facilities for treatment. Reasons for failure to take proper timely treatment were poverty, distance of the hospital from the patient's home and too far advanced stage of malignancy. Only 35 patients presented for diagnosis within one month of development of symptoms and 12 within 2 months.

BRONCHOGENIC CARCINOMA: A CLINICO-RADIOLOGICAL AND HISTOPATHOLOGICAL RELATIONSHIP

T.N. SHARMA *et al*

Sixty one histologically proved cases of malignancy between 1979 and 1983 were studied. In 27, the tumour was of squamous cell type, in 16 small cell type, in 11 adeno-carcinoma and in 7 large

cell type. Commonest radiological appearance was hilar involvement in 62 % of small cell carcinoma. Bronchial obstruction was seen in 56 % of squamous cell carcinoma, peripheral mass in 54 % of adeno-carcinoma and cavitation in 15 % of squamous cell carcinoma. The provisional diagnosis was made in 153 patients, of which the record of 109 patients was available for complete analysis. There were 98 males and 11 females. Males predominated in all cell types except adeno-carcinoma where the number of cases in both sexes was almost equal. 24 were non-smokers and 47 heavy smokers. Bronchoscopy was normal in about 15%. Diagnosis was established by histopathological examination of the bronchial biopsy in 42 patients, lymphnode biopsy in 9, pleural biopsy in 9, and lung biopsy in 4 pleural fluids. Diagnosis was clinical and radiological in 25 patients.

SERUM IMMUNO-GLOBULINS IN PULMONARY TUBERCULOSIS—A 6 MONTH FOLLOW-UP

M.M. SINGH *et al*

Serum levels of IgA, IgM, and IgG were estimated in 30 patients of bacteriologically confirmed pulmonary tuberculosis. There were 20 controls. The Ig levels were estimated at 0, 3, 6 and 9 months after treatment by radial immuno-diffusion method. All the three Ig levels were higher in patients as compared to controls. The levels of Ig came down in patients who improved under treatment while the levels continued to rise in patients who did not improve.

COMPARATIVE STUDY OF ABO AND RH BLOOD GROUPS IN DRUG SENSITIVE CASES OF PULMONARY TUBERCULOSIS AND THOSE WHO ARE RESISTANT TO ANTI-TUBERCULOSIS DRUGS

BALDEV RAJ ET AL

ABO and RH blood groups were studied in 50 patients of pulmonary tuberculosis with bacilli sensitive to all the drugs; another 50 patients with bacilli resistant to one or more antituberculous drugs and 50 healthy controls. Persons belonging to blood group O were found to be more prone to develop pulmonary tuberculosis and inspite of extensive involvement majority of the patients in this group were less prone to develop resistance to anti-tuberculous drugs. Patients in blood groups B and RH-Neg were more prone to development of drug resistance as compared to other blood groups.

A STUDY OF SERUM MAGNESIUM AND COPPER LEVELS IN PULMONARY TUBERCULOSIS

S.N. GAUR *et al*

One hundred cases of bacteriologically confirmed pulmonary tuberculosis (28 fresh and 72 previously treated) were studied for Serum Mg and Serum Cu levels. The serum Mg levels were significantly lower in patients as compared to 20 controls, specially in fresh untreated cases. Serum Cu levels were significantly higher in all the cases. Serum Cu level was lower in heavy smokers than in light and non-smokers. Mg and Cu serum levels did not vary significantly with the bacillarity extent and cavity status of the lesion.

BRONCHOSCOPIC STUDIES IN THE. DIAGNOSIS AND EVALUATION OF VARIOUS TYPES OF TB IN CHILDREN

P.M. UDANI *et al*

(Paper not received)

CLINICAL REVIEW OF TUBERCULAR MENINGITIS IN CHILDREN

L. GAUNEKAR *et al*

Tuberculous meningitis accounted for 1 % of the total admissions from 1969 to 1981. The total number of cases was 70, 51 males and 19 females. 3 cases were in the age group 0-6 months and 9 in the age group 7-12 years; the remaining were in the age group 6 months to 6 years. 46% had contact history. BCG scar was visible in 30 % of the cases. Mantoux test was strongly positive in 50 %. X-ray chest was essentially normal in 36 %. Primary complex was seen in 33 % and miliary

lesions in 13%. 2 patients had x-ray evidence of raised intracranial tension. Altered sensorium was present in 83 %, meningeal irritation in 66 %, cranial nerve palsies in 50 % and varying paresis in 36 %. Fundus appearance varied from congestion to frank Papill-Oedema and Optic atrophy.

PANFX DISCUSSION ON “THE ROLE OF TUBERCULOSIS ASSOCIATION IN THE CONTROL OF TUBERCULOSIS”

Moderator: Dr. S.P. Pamra

Members : Drs. M.L. Mehrotra, K.C. Mohanty, R.V. Rajadhakshya, Radha Narayan and Mr. S.A. Rajagopalan

(Dr. S.P. Gupta, Tuberculosis Adviser to the Government of India could not participate)

The consensus of the discussion was:

1. The main role of the Tuberculosis Association is in respect of health education, case-finding and case-holding.

2. Health education media and aids should be carefully planned and designed by a Committee consisting of programme director, health education experts, sociologists, artists, marketing specialists etc.

3. The media should be produced centrally by the T.A.I, with legends in all national languages and supplied to the State Associations/Governments/other voluntary organisations interested in health education on no profit/no loss basis.

4. The dissemination of health education should be the responsibility not only of the Tuberculosis Association but also of the Directors of publicity/health educators working in districts or under local bodies. While planning health education, over-lapping should be avoided and there should be full co-ordination between the various agencies engaged in health education.

5. Apart from slides, films, posters, brochures, campaign should also include popular press, specially the vernacular press, T.V., radio, audio-cassettes, folk dances, folk songs etc. to carry the message.

The Government may be requested to allow broadcast and telecast of slogans aimed at case-finding and case-holding free of cost in the commercial services of AIR and Doordarshan respectively.

6. Facilities must be provided in the urban slums for people working on daily wages, to get their sputum examined without having to go to the nearest TB clinic in the urban areas. Volunteers to be provided by the Tuberculosis Association can, like health workers & C.H. Gs in the rural areas, help in the identification of the symptomatics and the official agencies may arrange for making sputum slides etc. Volunteers must be the residents of the locality itself.

7. The revised strategy for case-finding in the rural areas was by and large adequate. This activity should be stepped up by (a) involving the village panchayat, school teachers, post masters, religious heads, community leaders etc. (b) a cycle may be provided to the community health guide to increase his mobility in the village (c) if x-ray examination is considered necessary for any symptomatic, the expenses incurred on visiting the nearest X-Ray centre should be borne by the Tuberculosis Association (d) shibirs may be arranged as far as possible, to boost case-finding. Shibirs, however, must be based on existing health facilities (so that freshly diagnosed patients can be effectively treated) and preference should be given to under-served population, (e) if community health guide and male and female health worker scheme has not been introduced in any state, the Tuberculosis Association should explore the possibility of engaging volunteers on the pattern of Tamil Nadu scheme introduced last year in that state.

For effective functioning of this activity, a strong district branch of the Tuberculosis Association will be necessary.

8. In order to improve the compliance of the patients in treatment, it is necessary that drug

collection by the patients should be considerably facilitated. In the urban areas, the tuberculosis clinics can start subsidiary drug distribution centres in various parts of the city.

9. The Government may reconsider about distribution of drugs through the male/female health workers when they visit the village routinely. If for some reason, this proposal is still not accepted by the Government, the desirability of one patient going to the PHI for drug collection on behalf of all the patients in the village by rotation be explored. If need be, the expenses incurred by the patient in visiting the drug distribution centre be subsidized. The Tuberculosis Association/voluntary organisations may explore other procedures to facilitate drug collection by the patients in the rural areas.

10. The Government should see that drug supply is adequate and regular to all PHIs. In case of a temporary breakdown in the supply line (which should in any case be exceptional) Tuberculosis Association may supply the drugs to the treatment centre from its own funds as a temporary stop-gap measure.

11. If a patient, whether in the rural or urban areas is unable to work, and the family has no other source of income, the Tuberculosis Association should arrange for a suitable subsistence allowance for the patients' family as long as he is unable to work.

12. Adequate staff must be available both in the urban specialized clinics and the rural PHIs for taking defaulter action.

13. Incentives are not to be recommended for any activity as they are likely to encourage malpractices. However, recognition of outstanding performance through special awards, certificates etc. should be encouraged to improve the achievement of all workers in general.

14. The general medical practitioners must be involved in the implementation of NTP. The male and female health workers should establish a rapport not only with the allopathic practitioners but also practitioners of indigenous systems of medicine with a view to improve case-finding and case-holding.

15. Other voluntary organisations interested in tuberculosis control e.g. Rotary and Lions Clubs, Womens' organisations, youth clubs, N.C.C. and N.S.S. Volunteers etc. must be fully involved. For this purpose the Tuberculosis Association should have a rapport with these voluntary organisations and the activities should be so planned that there is co-operation instead of competition. A coordinating body may be essential at all levels to co-ordinate the activities.

16. The district tuberculosis officer must be fully involved in planning and implementation of all activities in connection with the programme. If there is a co-ordinating committee he should be an important member of this Committee.

17. To enable Tuberculosis Association to work shoulder to shoulder with the official agencies in all aspects of the national programme, there should be a continuous dialogue between it and the Government in respect of all activities. Tuberculosis Association must be represented on all committees, task forces etc set up by the Government for laying down the policies, strategies and programmes, monitoring and scrutiny of the performance and implementation of the programme in general. Health being a state subject, this representation should be given to the Tuberculosis Association not only at the centre but also at state level and right up to the periphery.

THE SCOPE OF THE ASPIRATION BIOPSY IN THE DETECTION OF ENDOMETRIAL TUBERCULOSIS

S.N. TRIPATHY *et al*

Two hundred and fifty patients of infertility, secondary amenorrhoea, dys-functional uterine bleeding or irregular menstrual cycle were studied from March 82 to March, 83. Endometrial biopsy and aspiration biopsy were carried out in all cases. Aspiration cytology was found to be superior to endometrial biopsy. Aspiration cytology is simple, painless and easy to perform in the out-patient department. Risk of anaesthesia and surgical complications is eliminated. Endometrial biopsy has another disadvantage in the sense that biopsy is taken only from one strip of endometrium whereas the aspiration procedure picks up cells from the entire endometrial cavity.

FEMALE GENITAL INVOLVEMENT IN PULMONARY TUBERCULOSIST. RAMA RAO *et al*

Ninety patients admitted in the tuberculosis ward of Kurnool Medical College Hospital were studied. 33 patients out of these were sputum positive. 77% had extensive bilateral disease and 7 showed evidence of inactive lesions. 51 % of these patients gave a history of amenorrhoea. Menstruation was normal in 1 /3rd of the patients. 15 patients had no child and 8 had more than 5 children. Endometrial biopsy showed tuberculous lesion in 6 patients and 2 patients had tuberculous lesion of the cervix. 4 patients went through full term of pregnancy after the diagnosis of genital tuberculosis and one had abortion.

Citation Read on the Occasion of the Presentation of TAI Gold Medal to Dr. K.V. Krishna swami, Retd. Professor and Head of the Department of Tuberculosis, Madras Medical College & Ex-Director, Government Chest Institute & TB Demonstration & Training Centre, Chetput, Madras.

The Tuberculosis Association of India awards every year a 'Gold Medal' to a person who has rendered outstanding service to promote the cause of



tuberculosis in India. For the year 1983, the Association selected for this Award Dr. K.V. Krishnaswami, Retd. Professor and Head of the Department of Tuberculosis, Madras Medical College and Ex-Director, Government Chest Institute and TB Demonstration & Training Centre, Chetput, Madras. Dr. K.V. Krishnaswami took his MBBS degree in 1947 and obtained the Doctorate in Medicine in 1952 from the Madras Medical College. After serving as Lecturer, Assistant Professor of Medicine, etc. in the Madras General Hospital and Stanley Medical College, Madras, from 1950-59, Dr. Krishnaswami was appointed as Professor and Head of the Department of Tuberculosis, Stanley Medical College and Medical Superintendent, Government TB Sanatorium in 1959. From 1971 to 1982, he was Dr. K. V. Krishnaswami Professor and Head of the

Department of Tuberculosis, Madras Medical College and Director, Government Chest Institute and TB Demonstration & Training Centre, Chetput, Madras.

Dr. Krishnaswami was a member of the Standing Technical Committee of the Tuberculosis Association of India during the years 1970-72 and 1975-80 and its Chairman and President of the 32nd National Conference on TB & Chest Diseases held in Trivandrum in 1977. He was Chairman of the Technical and Health Education Committees of the Tamil Nadu Anti-TB Association and a member of the Scientific Advisory Committee for the Tuberculosis Chemotherapy Centre (ICMR), Madras. He served on the Expert Committee on Tuberculosis among Students in the 3rd Asian Conference on Student Health in Thailand in 1966, and visited Japan under the Colombo Plan in 1969. He is an Expert Referee of the ICMR for evaluation of research projects in TB and Chest Diseases and is a member of the ICMR Task Force on TB. He is a member of the Action Group for TB Control in India constituted by the Union Ministry of Health & Family Welfare under the 20-Point Programme. He is a member of several Associations including the Research Institute of the Japanese Anti-TB Association.

Dr. Krishnaswami has been actively involved in teaching under-graduate and post-graduate medical students in Tuberculosis and Chest Diseases for over 33 years. He is Examiner for the Universities of Madras, Mysore, Delhi and Sri Venkateswara for post-graduate examinations. He has to his credit over 100 scientific papers and has carried out several research studies.

Dr. Krishnaswami is the recipient of many Fellowships and Awards, including the Dr. B.C. Roy Award in 1979. He was awarded the Wander-TAI Oration Award in 1974, the Dr. P.V. Benjamin Memorial Oration Award in 1977, the Fellowship of the Indian Academy of Medical Sciences in 1980 and the Fellowship of the National College of Chest Physicians (India) in 1982.

In recognition of the meritorious services rendered in the field of TB, the Tuberculosis Association of India decided to award its Gold Medal to him.

FEMALE GENITAL INVOLVEMENT IN PULMONARY TUBERCULOSIS

T.RAMA RAO *et al*

Ninety patients admitted in the tuberculosis ward of Kurnool Medical College Hospital were studied. 33 patients out of these were sputum positive. 77% had extensive bilateral disease and 7 showed evidence of inactive lesions. 51% of these patients gave a history of amenorrhoea. Menstruation was normal in 1/3rd of the patients. 15 patients had no child and 8 had more than 5 children. Endometrial biopsy showed tuberculous lesion in 6 patients and 2 patients had tuberculous lesion of the cervix. 4 patients went through full term of pregnancy after the diagnosis of genital tuberculosis and one had abortion.

Guidelines For Contributors

The Indian Journal of Tuberculosis is the official organ of the Tuberculosis Association of India and is published in January, April, July and October each year. It publishes original papers on all aspects of tuberculosis and non-tuberculous respiratory diseases. Reports on rare cases or conditions and cases of unusual interest are also published. Papers and case reports for publication should be sent, in duplicate, to the following address:

The Editor, Indian Journal of Tuberculosis,

Tuberculosis Association of India, 3, Red Cross Road, New Delhi—110001.

Material submitted is accepted on the understanding that it will be subject to editorial revision and that it has not been published elsewhere and, if accepted, will not be published anywhere else.

Manuscripts should be typed with double spacing and wide margin. The paper should be divided into the following four sections, in sequence: summary, introduction, material and methods, results and discussion. In the case of case reports, material and methods and results sections will be replaced by the details of the case. Introduction and discussion sections must be brief and all irrelevant details should be avoided. Discussion must not be a repetition of the results. Summary should, ordinarily, not exceed 150 words.

Tables and figures should be kept to the minimum and should have descriptive legends and should be numbered. They should be typed on separate sheets and attached at the end of the text. Diagrams and drawings, preferably larger than the desired reproduction size, should be in black ink on stout white paper or blue-lined graph paper. Photographs should be printed on glossy paper and submitted unmounted. Legends for photographs should be typed on separate sheets.

References should be cited in the text in the following pattern:

Kakar, Aranya and Nair, 1979.

All references should be listed in alphabetical order at the end of the article in the following sequence:

Name (s) of the author (s); full title of the paper, name of the Journal; year of publication, volume and first page number of the article.

Example: Kakar, A., Aranya, R.C., Nair, S.K.: Isolated gastric tuberculosis; *Ind. J. Tuber.*; 1979, 26, 205.

Twenty five reprints of the article are supplied free. If more reprints are required, the author must specify the number required while submitting the paper for publication. Reprints in excess of 25 will have to be paid for.

Full address of the author to whom correspondence is to be addressed in this connection may also be intimated.

Annexure

THIRTY-SIXTH WORLD HEALTH ASSEMBLY WAA 36.30

Tuberculosis Control in the World-Situation Analysis

The Thirty-Sixth World Health Assembly.
Recalling resolution WHA 33.26

Having considered the Director-General's report
on Tuberculosis Control;

Nothing that tuberculosis continues to be an
important health problem in the world, parti-
cularly in developing countries, where little
improvement has been achieved in the last
two decades;

Recognising that improvement in socio-
economic conditions will have a beneficial effect
on the tuberculosis situation;

Emphasizing that progress in tuberculosis
control requires a sustained effort and that the
programme must be integrated into compre-
hensive health systems based on primary
health care;

Convinced that the social target of alleviating
human suffering and preventing death and
disability from tuberculosis is achievable in the
context of primary health care and in accordance
with the goal of Health for All by the
year 2000;

Recognising that the epidemiological target
of interrupting tuberculosis transmission and
substantially reducing the magnitude of the
tuberculosis problem in the world can only
be achieved gradually;

Expressing its appreciation of the collabora-
tion of the International Union Against
Tuberculosis and other nongovernmental
organisations in furthering the general policy
of WHO in tuberculosis control;

1. URGES Member States to intensify their
efforts to extend tuberculosis diagnostic, treat-
ment and prevention services to the whole
population, and to do this by promoting close
collaboration between those responsible for
the development and organisation of health
system infrastructure based on primary health
care and those responsible for tuberculosis
control;

2. REQUESTS the Director-General:

(1) to continue to collaborate with Member

States in the development and streng-
thening of tuberculosis control progr-
ammes as a component of primary
health care, and to ensure that expertise
in tuberculosis control remains
available to the international and
national communities

- (2) to continue to support BCG vaccination
in children within the expanded Progr-
amme of Immunization in accordance
with the present policy of the
Organisation;
- (3) to promote sociological and health
systems research in order to establish
baselines for programme planning and
evaluation and to determine the most
efficient ways of delivering the appro-
priate technologies through the health
system infrastructure and of ensuring
community participation;
- (4) to promote fundamental and technolo-
gical research, particularly in the fields
of epidemiology and immunology, aimed
at providing more effective preventive
and diagnostic methods;
- (5) to promote collaboration between
tuberculosis programmes and progr-
ammes concerned with the organisation
of health systems based on primary
health care, health laboratory technology
programmes, drug action programmes,
and programmes in public information
and health education.
- (6) to promote the development and streng-
thening of training programmes on
the technical and management aspects
of tuberculosis control as an integral
part of the curricula for the training
of all categories of health personnel;
- (7) to make all possible efforts, through
collaboration between the action progr-
amme on essential drugs and the
pharmaceutical industry, to ensure that
the most effective chemotherapeutic
regimens become more widely accessible
to developing countries.
- (8) to keep the Executive Board and the
Health Assembly informed of global
progress in tuberculosis control.

Thirteenth plenary meeting, 16 May 1983
A36/VR/13,

NEWS & NOTES

ANNUAL MEETINGS OF THE T.AJ.

The 45th Annual General Meeting of the Tuberculosis Association of India will be held at 11.00 A.M. on Thursday, the 19th April, 1984, in the Conference Hall of the Association, 3-Red Cross Road, New Delhi-1. The Annual Meeting will be followed immediately by a meeting of the Central Committee of the Association.

The Conference of Secretaries of State TB Associations will be held in the afternoon on 19th April, 1984.

A meeting of the Technical Committee of the Association will be held at 9.30 A.M. on Wednesday, the 18th April, 1984.

CHAIRMAN, TECHNICAL COMMITTEE

Dr. A.G. Patel, former Medical Superintendent, S.P. Sanatorium, Baroda, and presently TB Adviser to the Government of Gujarat, has been nominated as Chairman of the Standing Technical Committee of the Tuberculosis Association of India for 1984 *vice* Dr. S. Sivaraman whose term of office expired with the 38th National Conference held in Goa in October, 1983. Dr. Patel will also preside over the 39th National Conference on Tuberculosis and Chest Diseases to be held in Cuttack (Orissa) in November, 1984.

TAI AWARDS—1984

The Tuberculosis Association of India has decided that its prestigious 'Khushi Ram Shield' for outstanding work during the year 1983 be awarded to the Tuberculosis Association of Andhra Pradesh and the 'Bhai Mohan Singh Cup' for outstanding general activities and achievements during the year to the Bengal TB Association. The Association has also decided to award a Certificate of Merit for good work done during the year particularly in the field of health education to the Anti-TB Association of Tamil Nadu.

The Association's TB Seal Trophy for highest collections from the 33rd Seal Campaign has been won by the Tamil Nadu Anti-Tuberculosis Association and the Runner-up Cup for the next highest collections by the TB Association of Kerala. The Silver Cup for the highest collections by smaller States has been

won by the TB Association of Goa, Daman & Diu.

39TH NATIONAL CONFERENCE

The 39th National Conference on Tuberculosis and Chest Diseases will be held in Cuttack, Orissa, from the 9th to 12th November, 1984 under the joint auspices of the Tuberculosis Association of India and the Orissa TB Association. Those who wish to attend the Conference and present papers at its Scientific Sessions may kindly send two copies of the abstract of their papers to reach the Secretary-General, Tuberculosis Association of India, 3, Red Cross Road, New Delhi-110 001, latest by the 15th of May, 1984.

RANBAXY-ROBERT KOCH ORATION

The Tuberculosis Association of India has selected Dr. V. Ramalingaswami, Director-General, Indian Council of Medical Research, New Delhi for this year's 'Ranbaxy-Robert Koch Oration', which will be delivered at the 39th National Conference on Tuberculosis and Chest Diseases to be held in Cuttack in November, 1984.

WANDER-TAI ORATION

Dr. M.S. Agnihotri, Professor of Tuberculosis (Respiratory Allergy), K.G. Medical College, Lucknow, has been selected for this year's 'WANDER-TAI ORATION' which will be delivered at 39th National Conference on TB & Chest Diseases to be held in Cuttack in November, 1984.

CHANCHAL SINGH MEMORIAE AWARD-1984

The Tuberculosis Association of India will award a cash prize of Rs. 1000/- to a medical graduate below 45 years of age and working in tuberculosis, for an original article based on work done by the author himself/herself, not exceeding 30 double spaced fool-scrap typed pages (approximately 6000 words) excluding charts and diagrams on a subject relating to tuberculosis. Papers with more than one author are not eligible. Papers may be sent, in quadruplicate, to reach the Secretary-General, TB Association of India, 3, Red Cross Road, New Delhi-110 001, before the 31st of July, 1984.

ESSAY COMPETITION-1984

The Tuberculosis Association of India awards every year a cash prize of Rs. 500/- to a final year medical student in India for an original essay on Tuberculosis, adjudged best by a Special Committee of the Association. The subject selected for the 1984 competition is "Problems of Tuberculosis Control in India". The essay should be written in English, typed in fool-scrap size, double-spaced and should not exceed 15 pages (approximately 3000 words, excluding tables, diagrams, etc.). Four copies of the manuscript should be forwarded through the Dean or Principal of College/University to reach the Secretary-General, TB Association of India, 3, Red Cross Road, New Delhi-1, before 31st July, 1984.

STATE CONFERENCES

The 9th Karnataka State TB & Chest Diseases Workers' Conference was held in Mysore on the 21st and 22nd January, 1984 under the joint auspices of the Karnataka State TB Association and the District TB Association of Mysore. The Hon'ble Shri B. Rachiah, Minister of Education, Karnataka State, inaugurated the Conference and the function was presided over by Prof. K.S. Hegde, Vice-Chancellor, Mysore University. Shri P. Vishwarrath, the Mayor of Mysore City Corporation, opened the Scientific Exhibition organised in connection with the Conference and Dr. Iqbal Begum, Joint Director (TB), Karnataka Govt. released the films and other health education material on tuberculosis. Shri P.N. Raman, Secretary-General, TB Association of India, conveyed the greetings and good wishes of the parent body and released the Souvenir brought out on the occasion. Dr. K.G. Yedurappa, Prof. of TB & Chest Diseases and Superintendent, P.K. TB Hospital, Mysore presided over the Conference and Dr. Benjamin Issac, Superintendent of the C.S.I. Hospital, Bangalore, inaugurated the Scientific Sessions. In all 15 papers on various aspects of TB and Chest Diseases were presented and discussed. These included five guest lectures by Dr. Benjamin Issac, Dr. K.V. Krishnaswami, Dr. K.G. Yedurappa, Dr. V.K. Jain and Miss M.A. Seetha. There was also a Question and Answer Session during which several questions from the delegates in regard to the diagnosis and treatment of tuberculosis were answered by a panel of specialists. The Conference was attended by about 200 delegates from all over the State.

The 20th Maharashtra State TB and Chest Diseases Workers' Conference was held in Hotel President, Bombay, on the 11th and 12th

February, 1984. The Conference was inaugurated by His Excellency Shri Homi J.H. Taleyarkhan, Governor of Sikkim, and the Minister for Finance and the Minister for Health, Maharashtra State, were the Guests of Honour. Dr. J.C. Kothari, an eminent specialist of Bombay, presided over the Conference. The subjects discussed covered all aspects of tuberculosis. Guest lectures were delivered by Dr. S.P. Tripathy, Dr. A. Zahra of WHO, Dr. K.V. Krishnaswami and Dr. S.P. Pamra. The Conference was attended by about 200 delegates.

The 12th Andhra Pradesh TB & Chest Diseases Workers' Conference under the joint auspices of the TB Association of Andhra Pradesh and TB Association of Ranga Reddy District was held at Government TB Sanatorium, Ananthagiri, Vikarabad, on 25th and 26th February, 1984. Shri Ram Lai, Governor of Andhra Pradesh, inaugurated the Conference and the inaugural session was presided over by Shri S. Ramamuni Reddy, Minister for Medical & Health & Indian Medicine. Smt. Ram Piari, wife of the Governor distributed the Awards, while Shri Narendra Luther, I.A.S., Principal Secretary to Govt., Medical & Health Department, released the Souvenir brought out on the occasion. Dr. S.C. Kapoor, Chief Medical Officer, South Central Railway, was the President of the Conference. The Scientific Session was inaugurated by Dr. B. Kameswara Rao, Director of Health & Family Welfare. There were three Orations—Viz. "the Dr. P.V. Benjamin Memorial Oration" by Dr. A.L. Goswami, Calcutta, "Dr. Kanwal Chander Memorial Oration" by Dr. K.J.R. Murthy, Hyderabad and "Wander-T.A.A.P. Oration" by Dr. C. Srinivasa Rao, Hyderabad. Drs. K.V. Krishnaswami of Madras and S.K. Sharma of Ajmer were the Guest Speakers. The Scientific Sessions included a symposium on "Short-term Chemotherapy", Panel discussion on "Respiratory Failure", session on District TB Control Programme and three sessions for Assorted Papers on various aspects of tuberculosis. The 21st Annual General Meeting of the State Association and the 18th Conference of Secretaries of District TB Associations were also held on the 25th February, 1983.

The XIIth Gujarat/State Tuberculosis Workers' Conference was held on 25th and 26th February, 1984 at Navsari. The Conference was inaugurated by Shri Rozal Jal Mehta, Managing Director of Navsari Cotton Mills and the function was presided over by Dr. A.G. Patel, Chairman of the Gujarat State TB Association. The Scientific Session was inaugurated by Dr. M.D. Deshmukh of Bombay

and Dr. T.B. Mester was the Chief Guest. The Conference included a symposium on the use of Rifampicin to strengthen regimens under NTP, in which six District TB officers participated. There was also a panel discussion on 'Extrapulmonary tuberculosis', a session for assorted papers and a session for para-medical workers. 711 delegates, including 384 para-medical workers, attended the Conference.

REFRESHER COURSES

The TB Association of Meghalaya organised its first Refresher Course on Tuberculosis on the 21st January, 1984 at the Pasteur Institute, Shillong. Shri S.K. Marak, Minister for Health & Family Welfare of Meghalaya, inaugurated the course, while Dr. E. Lyngdoh, Director of Health Services, presided over the function. Dr. S.P. Pamra, Hony. Technical Adviser, Tuberculosis Association of India conducted the course which was attended by 117 doctors consisting of private practitioners, general duty medical officers working in various government and private hospitals and primary health centres, medical officers of the Army Hospital and Border Security Force and other agencies providing medical care.

The Assam TB Association organised a Refresher course on Tuberculosis on 22nd January, 1984 at the LGB Chest Hospital Auditorium, Gauhati. The course was inaugurated by Shri K. Bora, the Health Secretary of Assam. 28 doctors attended the course which was conducted by Dr. S.P. Pamra, Hony. Technical Adviser, Tuberculosis Association of India.

The Maharashtra State Anti-TB Association organised two refresher courses on tuberculosis. The first course was held on 22nd January, 1984 at I.M.A. House, Nasik with the collaboration of Nasik District TB Association and the Nasik Branch of the Indian Medical Association. Drs. K.C. Mohanty, Mutha and Gangurde delivered lectures on the various aspects of tuberculosis. 175 general practitioners attended the course. The second refresher course was held on 4th March, 1984 at Sholapur with the collaboration of Sholapur Dist. Anti-TB Association, Sholapur branch of the I.M.A. and the Medical College. Lectures on "Chemotherapy", "Extra-pulmonary TB and Control Methods" and "Urban TB Control—Bombay plans, problems, etc. were delivered by Drs. K.C. Mohanty, M.D. Deshmukh and A.P. Rao respectively. About 135 general practitioners attended the course. There was also an Open House Session in which about 60 questions were answered by Drs. K.C. Mohanty, M.D. Deshmukh and A.P. Rao.

The Karnataka State TB Association organised two refresher courses on Tuberculosis. The first course was held on 28th January, 1984 at the C.S.I. Hospital, Bangalore and it was inaugurated by the Director of Health Services, Karnataka. Dr. G.V.J. Baily, Director of the National TB Institute, Bangalore, chaired the Scientific Sessions. Drs. G.V.J. Baily, Kohli, Benjamin Issac and T. Manickam gave lectures on various aspects of tuberculosis. The course was attended by 65 doctors. The second refresher course was held on 4th March, 1984 in the IMA House, Bangalore. Dr. K.S. Shekar, President, Indian Medical Association, Bangalore branch, inaugurated the course which was attended by about 70 doctors. Drs. K. Ramasetty and E.V.V. Gupta spoke on the role of General Practitioners in Tuberculosis in case-detection and drug default. Dr. P. Chandrasekhar of the National TB Institute spoke on the history of the disease and development of drugs.

HARYANA ASSOCIATION

The General Body of the Haryana State TB Association met on 15.2.1984 at Chandigarh under the chairmanship of the State Health Minister and reconstituted its various committees with a view to revitalise the various activities of the Association. The meeting was attended by the Health Secretary, all senior officers of the Health Directorate, all CMOs and DTOs and a few special invitees. The Health Minister and the Health Secretary assured the State Association of all assistance in their future activities and expressed the hope that the Association will take up its work in right earnest and will be able to give a good account of its performance during the current year. Dr. S.P. Pamra, Honorary Technical Adviser, Tuberculosis Association of India, attended the meeting and conveyed the greetings of the Tuberculosis Association of India and highlighted the various activities which the State Association should take up immediately. He had detailed discussions with the Director of Health Services, Haryana and Secretaries of the Tuberculosis Associations of Haryana and Punjab regarding revitalisation of their activities.

OBITUARY

Dr. Raj Narain, a very senior tuberculosis worker, died suddenly on the 8th March, 1984. After obtaining the TDD from Madras, he joined the New Delhi TB Centre soon after its inception in 1942. He served this institution till 1959 and was working as its Epidemiologist when he joined the National Tuberculosis Institute. He later was appointed as Project Director of the Tuberculosis Prevention Trial under the ICMR and worked in that capacity

till his retirement. After retirement, he worked as an Adviser in several institutions in USA and Canada.

Dr. Raj Narain was a scientist of national and international reputation. He has several important studies, mainly in the domain of epidemiology of tuberculosis, in addition to t

to his credit. The results of the studies have been presented at several national and international conferences and he was the author of over 100 original papers published in national and international journals. Dr. Raj Narain's sudden death is a great loss and the Association offers its deepest condolences to the bereaved family.

KEDARNATH LAHA MEMORIAL AWARD

The CALCUTTA SKIN INSTITUTE, Calcutta, invites thesis for the above award for an original work based on research studies conducted during the last five years in the field of dermatology by Scientists below 35 years of age. The award carries a scroll and a cash award of Rs. 1000/-. One copy of the thesis (non-returnable) is to be sent to the Secretary, Calcutta Skin Institute, 169 VIM CIT Scheme, Calcutta-700 054 by June 30, 1984.