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URBAN TUBERCULOSIS CONTROL PROGRAMME

Till recently the control of tuberculosis all over the world centred round sanatoria/hospitals. The total number of beds available in all hospitals/sanatoria put together in our country was grossly inadequate by generally accepted standards. Domiciliary treatment was, therefore, advocated and tuberculosis clinics were started in a few cities in the country. With the advent of antimicrobial drugs, results of domiciliary treatment became as good as those of hospital treatment and the emphasis shifted from hospitals to clinics and BCG vaccination as the mainstays of our control programme.

The first national sample survey revealed that there was nearly as much tuberculosis in our villages as in the cities. The need for providing diagnostic and treatment facilities in the rural areas, where practically none existed at that time, thus assumed paramount importance. The national tuberculosis programme (N.T.P.) introduced in 1962 aimed at providing these facilities in the rural areas by integrating tuberculosis work with the general health services in the country. Health institutions of all denominations in a district are required to take up case-finding by sputum direct microscopy or sputum and x-ray examination (if the facilities for latter are available nearby) and treatment of those found tuberculous. But since x-ray facilities are rather scarce, except in district headquarters town, bulk of the cases in rural areas have to be diagnosed on the basis of positive sputum only.

Facilities in big cities, however, are much better than those obtaining in the rural areas even when the NTP is fully implemented. More than one specialised clinics are usually functioning and X-ray facilities are amply available. Therefore, *modus operandi* of the programme for the big cities can be different from that in the rural areas, without compromising the essentials of the NTP viz. providing diagnostic and treatment facilities as efficiently and as near the patient's place of residence or work as possible.

The main difficulty however is that in many cities, clinics and hospitals still work in isolation without any co-ordination between these. This leads to frittering away of the already inadequate resources. Delhi took the lead in 1962 by starting an organised tuberculosis programme in the city as a pilot project. The entire union territory was divided into zones, each zone to be the responsibility of an existing TB clinic for purposes of case-finding and intensive domiciliary care. The patients could get free supply of drugs only at their own regional clinic. The working of the clinics and the hospitals was co-ordinated so that patients ordinarily could be admitted only on the recommendation of

the regional clinic if they fulfilled the criteria for admission which were clearly laid down. Emergencies from any part of the territory were to be admitted immediately. A Committee on which all the tuberculosis institutions including clinics and hospitals were represented was made responsible for technical guidance so that uniform standards and procedures could be adopted in all clinics. The Tuberculosis Control Officer of the Delhi Corporation was made responsible for processing of notifications, BCG vaccination programme, drug supply and other allied matters. Even though all the 10 clinics and 2 hospitals in Delhi are not under the administrative control of one authority, all these institutions function as a loosely knit team working in good liaison with each other and in accordance with mutually agreed standards and procedures. This programme has stood the test of time and can well be the prototype for similar programmes in other big cities in the country with modifications, where necessary, to suit the local conditions.

This issue contains three articles on the problem of tuberculosis control in large cities. The document of the **Standing Technical Committee** was the result of a thorough discussion of the problem, first in the national conference in January, 1970 and then in two meetings of the Standing Technical Committee. It has been before the Government since then. Main functions of the *Agra neighbourhood clinic* is drug distribution and subsidiary drug distribution centres are also recommended by the Standing Technical Committee and are already functioning in a few large cities. The blue-print of the National Tuberculosis Institute tallies with most of the operative clauses of the programme recommended by the STC with two major differences. Should case-finding be the responsibility of the general health institutions even in large cities, as in rural areas? In rural areas, there is no alternative to case-finding being the responsibility of general health institutions. In urban areas it need not necessarily be so as better facilities are available in specialized clinics. Any one who has studied the working of urban dispensaries where a doctor has to dispose off as many as 50 patients per hour, would realize that screening patients for sputum examination and arranging for it in such a set-up would be almost impossible. To provide specialized staff in each general dispensary for tuberculosis case-finding will be uneconomical. Thus, if any general hospital is in a position to provide a diagnostic service, it should be encouraged and helped, but for quite some time, case-finding will have to be the responsibility, by and large, of the already functioning specialized clinics, with the general hospitals/dispensaries functioning as *referral centres*. This will certainly be cheaper and more efficient. Neither will it be against the objectives of the NTP nor will it cause any appreciable hardship to the patients who are usually living within a reasonable distance of a specialized clinic with fairly adequate transport facilities. Even in district headquarters towns the case-finding is almost entirely carried out in the district TB centres. Why not then in big cities also?

The position regarding drug distribution is not different. There can be no two opinions about making facilities for collection of drugs available as near the patient's home or place of work as possible. General dispensaries may be somewhat nearer than the TB clinic but they do not have the necessary staff to maintain elaborate record to ensure regularity in treatment and take prompt retrieval action in the case of drug default. And these are essential for success

in treatment. Subsidiary drug distribution centres in far-flung areas of the city managed by the staff of the specialized clinic are serving the purpose satisfactorily wherever introduced.

Thus, while full integration of diagnostic and treatment services in respect of tuberculosis with general health facilities is an acceptable and desirable ultimate objective, expediency and efficient service demand that till such time as general institutions are adequately staffed and equipped to take up this additional load, diagnosis and treatment of tuberculosis should continue to be the responsibility of specialized clinics in big cities as at present. A change which at the present stage of development of general health institutions cannot improve matters but may lead to increased possibility of mis-diagnosis and irregularity in chemotherapy would not only be unreasonable but may prove disastrous for tuberculosis control.

What is of much greater importance today is that there must be a central authority responsible for tuberculosis control in the big cities, co-ordination in the working of all clinics and hospitals and regionalization so that the facilities in each clinic are properly utilized. Free diagnostic service, free supply of drugs from all clinics to all deserving patients, an efficient machinery for domiciliary supervision and defaulter action and realistically planned BCG vaccination are of course the *sine qua non* of an organised control programme. It is time that all big cities in the country put such organised programmes in operation. The matter is too serious to brook any further delay.

A TUBERCULOSIS PROGRAMME FOR BIG CITIES

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Introduction

It is sometimes said that District Tuberculosis Programme (DTP) was planned mainly with rural India in mind. And that problems of metropolitan and other big cities with population 500,000 and more being different from those of district headquarters towns, that can be served quite effectively by District Tuberculosis Centres (DTC), it is imperative to have a different programme for big cities. Not to do that on ground of programme uniformity would be inexcusable (Pamra, 1974).

These contentions need careful consideration despite the conceptual truism that two programmes, one for the urban and other for the rural people, embodying different quality of service would be sociologically repugnant. Besides, such an approach may be inconsistent with the accepted objectives and principles of our health planning. Even though the plea for having a separate programme for cities can easily be set aside, practical wisdom would demand that DTP be altered to become more acceptable to city tuberculosis workers, without disturbing unduly the structure of National Tuberculosis Programme (NTP).

Problems of Big Cities

Precisely, what are the problems that according to city tuberculosis workers deserve a different kind of programme for big cities?

Firstly, for well known historical reasons the available diagnosis and treatment facilities, though seldom BCG vaccination, in big cities are much better than in smaller cities, where those were actually put up after the DTP came into existence. Secondly, city people being educated and sophisticated desire up-to-date facilities more often than peasants. Thirdly, means of communication are better in big cities and fewer problems are likely to be met with in travelling to better equipped distant clinics. Fourthly, more often than not there are multiple institutions — tuberculosis clinics, sanatoria and hospitals — that offer specialised service to the needy but under different managements. The quality of service and the charges to be paid in such institutions vary, permitting the people a choice according to their fancy, preference, or capacity to pay. Unfortunately, it is also true *paripassu* that multiple independent institutions

usually function without co-ordination, resulting in considerable waste of resources, not to speak of multiple registration and migration from one institution to another, without commensurate benefit either to patients or the service. Lastly, staff in independent institutions may not fully appreciate why they should alter their established ways of work for considerations that do not concern them directly.

Two difficulties more may also be mentioned. While any and every city institution might welcome an addition to its facilities, staff, or area of operation, hardly any is expected to agree to their reduction or regulation for the sake of better use of the resources or co-ordination. Herein lies a barrier. Past attempts in this country at rationalisation and co-ordination (for example, better and more complete utilisation of the limited number of tuberculosis beds) have neither proved popular nor very successful. Secondly, there is apparently far keener interest in multiplying specialised institutions and expanding their sophisticated facilities than, say, in extending the tuberculosis programme to entire population by utilising whatever facilities are available in general health institutions. The reasons for this lack of identity between the general and specialised services are not far to seek. The contention that health personnel do not take as much interest in tuberculosis as the tuberculosis workers do, is true to an extent. This is neither unexpected nor sufficient reason to exclude general health institutions from the purview of the tuberculosis programme in big cities. The incongruity only lies in the admission that tuberculosis these days is being diagnosed and treated by general practitioners, especially in big cities, and what is needed is a mechanism that they do so correctly. Conceptually, the National Tuberculosis Programme also is integrated with the general health services (Nagpaul, 1967).

A tuberculosis programme for big cities might accept all the mentioned difficulties, to enlist the co-operation of city tuberculosis workers. Nevertheless evidence is slowly accumulating that some of the difficulties at least are not true. For example, it is not infrequent that a few of the specialised city institutions have even less facilities than those in a DTC. City folks may not be all that sophisticated and choosy or conveyance all that convenient, as is often made out. Even in a big city (Nagpaul et al, 1970, Gothi et al,

1970), a sizeable proportion of tuberculosis patients may contact a general health institution and be treated there first. And, similar to rural dispensaries (Rangana et al, 1968) a majority of patients attending a city tuberculosis clinic live within four walking miles, despite the good communications. In fact, the observed behaviour of urban compared with rural patients, in respect of distance of home from clinic, number and duration of symptoms hardly suggests any intrinsic difference between the two.

In addition to formulating a programme that meets with the mentioned problems of big cities, one must keep in mind and provide for (i) fuller utilisation of the available resources, (ii) a co-ordinated and standard way of work, (iii) an adequate and uninterrupted supply of the essentials e.g., anti-tuberculosis drugs, BCG vaccine, X-ray films, etc., (iv) regular supervision, as well as (v) periodic assessment.

It is the contention of this paper that a city tuberculosis programme (CTP) which meets with most of the mentioned difficulties and is rational at the same time, has to depend upon the principles underlying the DTP. It need not be called a separate programme. In other words, a tuberculosis programme for big cities and DTP are not mutually exclusive. The common belief that DTP represents only the minimum that is suitable only for poor countries or areas where no facilities exist is erroneous. The impression appears to have been caused by the DTP having been first applied to vast rural areas where no facilities to diagnose and treat tuberculosis existed (Nagpaul, 1967), without considering the basic principles underlying the programme.

Principles Underlying DTP

The following DTP principles should dispel the fairly common impression that their application to big cities would mean (i) poor use of the existing specialised facilities for the sake of programme uniformity and (ii) disintegration of the specialised services since DTP is to be integrated with general health services.

1. Regional/nation

It implies, (i) the service is offered systematically to all living in a clearly demarcated area who are eligible for it (B2, C1), (ii) as the ultimate responsibility of a single authority (City Tuberculosis Officer, A3) and not of multiple uncoordinated agencies/institutions, (iii) in a multilevel arrangement so that the comparatively less patients needing more sophisticated care are referred to a fewer specialised though

distant centres (C1, C) and (iv) in a manner that includes both curative and preventive measures offered as a well—organised and coordinated service.

The operational feasibility and value of referring patients from one health institution to another has yet to be scientifically studied and evaluated. Nevertheless referral forms an important element of the regionalisation concept. As regards the rather large number of those with chest symptoms at general health institutions who are smear negative, referral to the area tuberculosis centre is advisable only after repeated sputum examination and even selection on the basis of clinical judgement (C 1),

2. Sociological Basis.

A programme is to benefit the people and not the people a programme. One of the primary aims of the programme has to be satisfaction of the felt needs of the people (suffering), as reflected by ailment(s) for which they seek assistance, at the kind of health institutions and the manner thereof. Therefore, case-finding among asymptomatics is not done (C4) and general as well as specialised health institutions form a part of the service network (B 1). The observed behaviour of patients during diagnosis and while on treatment is given more importance than some of the technical considerations kept foremost by specialists.

3. Epidemiological Return

Alleviation of suffering is sought in a way that holds a reasonably good promise of epidemiological impact. Case-finding as well as treatment are organised on a wide enough scale and to a degree that could cut transmission of infection sufficiently well, thus preventing tuberculosis. Therefore, top priority is given to the sputum positives, and among them to those positive on smear compared with others positive only on culture or abacillary patients (C 5). However, abacillary patients are not neglected, even though they are more often irregular in their drug intake on account of less acute or no symptoms. The popular tendency to accord abacillary patients equal or higher priority to prevent their break — down — so called 'early treatment' — is not based on controlled scientific studies.

4. Optimal Use of Resources

Programme expansion and efficiency demand an optimal use of the available resources. At least there should be no obvious wastage. Men,

money and materials needed for community-wide disease control programmes are limited in all the countries; only the extent of the limitation varies. Following at any cost, what some other country might have attempted or attempting some technically perfect programme only in selected limited areas, such as metropolitan cities, has hardly any practical meaning in so far as the overall control of tuberculosis is concerned.

Above all and in addition to the above basic principles, a city tuberculosis programme must constitute a part of the wider whole i.e., National Tuberculosis Programme. Therefore, DTP and CTP have got to be similar in the essentials. Moreover, CTP should be implemented only when faced with the problems of big cities and not just because a population is 500,000 or is expected to reach that figure in the near future. Besides, it is desirable to tailor each CTP to the distinctive administrative, operational and social conditions of each big city, resulting in several essentially same but apparently different CTPs, in the same NTP.

City Tuberculosis Programme

Following could be the outline of a CTP; *A.*

Organisation

1. At first a Central Control Agency (CCA) is set up by the Government, being the authority responsible for NTP and best suited to assist and bring about co-ordination among health institutions. Essentially its composition is the government representative, heads of all tuberculosis institutions in the city, and nominees of municipal corporation, ESIS, IMA, tuberculosis association, etc. Alternatively, heads of all tuberculosis institutions in a big city together may constitute the CCA and resume all its powers as well as responsibilities, with the approval of the Government. If membership is unwieldy, the CCA may appoint a sub-committee to recommend on technical matters.

2. The CCA (i) co-opts heads of all the bigger general health institutions, (ii) decides on the essential procedures of work (technical as well as administrative) in the form of a written guide (A 5), (iii) appoints the "CTO" (A 3) or selects a "leader unit" to undertake all the duties and responsibilities, (iv) prepares the budget and secures necessary financial grants (A &), (v) enlists all round co-operation to ensure the success of CTP (A 9, D 3-4). No specialised institution may normally have the option to stand out of CTP. Selection however is exercised in respect of general health institutions (B 1).

In actual practice the role of CCA is not expected to be easy; government's initiative alone — in setting up the CCA — may not be sufficient. Persons eager to work out a trend— setting role in big cities and having influence among health workers are more apt to succeed.

3. The CCA functions through a City Tuberculosis Officer (CTO) and his staff, comprising one or two tuberculosis control teams (Nagpaul, 1972), a few statistical and some secretarial staff. The CTO either has a separate entity and office (A 2) or one of the specially suitable specialised institutions is selected as the "leader unit" to function as CTO with the help of its own staff and tuberculosis control teams enabling both the functions to be performed economically.

4. The main functions of CTO are planning (B1-2), implementation of CTP to cover the entire population (B3-9), training staff of general health institutions, supply of drugs, BCG vaccine, X-ray films, stains, etc (B11), repair and maintenance of equipment (B11), co-ordination, recording and reporting (C13) and programme supervision (D 3). Being responsible for programme's success, the CTO is answerable for the control of tuberculosis in the city. Accordingly, a senior and influential person is appointed as CTO and sufficient powers of the CCA are delegated to him (A 2). He would already have undergone DTP training and gained sufficient experience in the NTP.

5. The CTO prepares and faithfully follows a detailed manual approved by the CCA on how CTP is to function. The advantages to be derived from participating in CTP, the obligations, and the detailed day-to-day work are set forth clearly in the manual for guidance of all the participating health institutions. The CTP manual broadly follows the NTP manuals, with changes considered necessary for city conditions.

6. A city Tuberculosis Case-index and a central procurement, supply and equipment repair organisation are set up in the office of the CTO to support all CTP functions (B 10, 11).

7. The "population" to be covered by CTP is not only that residing in the city but that in the adjacent periphery as well, for whom the city is the socio-cultural centre.

8. The CTO operates his own budget. The bulk of it is meant for supplies to the participating health institutions, a part for the extra staff posted at some area tuberculosis centres (B 5), office expenses, and some for equipment

that may have to be supplied to some institutions (B 5).

9. Administration of the participating institutions is maintained inviolate; only functional changes are permissible. The relation ship between participating institutions —general as well as specialised —and between institutions and CTO is that of mutual co-operation.

10. Normally the CTO deals directly with specialised institutions only, which in turn work with the area general health institutions. However, no hard and fast lines need be drawn and CCA is competent to deal with the problems of mutual relations. Private practitioners may expect assistance from CTP in diagnosis and treatment. In return they send periodic reports to the area tuberculosis centres (B 3, C 13).

11. The CTO co-ordinates fully with the programme directorate at the state and national levels. Regular reports are sent for inclusion in NTP reports; besides periodic special reports are published separately on the working of CTP. Programme supervision and assessment are done in accordance with the national pattern (D 3).

12. If a big city also is headquarters of a district with a large rural component, then the CTP and DTP patterns are harmonised: one of the area tuberculosis centres functions as the DTC (with a DTO and tuberculosis control team for touring the rural area) but the case-index, for the city and the rural area, is one and is maintained in CTO's office.

13. If a State's STC is located in a big city (D 1), the CCA considers the possibility of either making it the leader unit of CTP (A 2) or delegating to it the CTO's responsibilities with regard to training and the repair of equipment.

B. General Plan of Action

1. The CTO at first undertakes a general survey of all the health institutions in the city. Their staff strength, facilities, work loads, budgets, etc. are noted down. Such of the general institutions as are completely unsuitable for undertaking CTP activities are excluded. Others are listed as a wise (B 2) for inclusion in CTP. None of the specialised institutions are excluded.

2. The population (A 7) is divided into "areas", equal to the number of tuberculosis institutions (B 1). The size and population allotted to each area depend upon location, staff, facilities, etc of the specialised institutions and

the number and kind of general institutions around them. Areas need not be equal in size or population.

3. Tuberculosis institutions are then developed into "area tuberculosis centres", one each for its respective area (B5). While opening of new tuberculosis centres need not be ruled out, multiplying them may not be the best way to cover the population with the programme. Instead, adding fewer crucial staff at the existing well developed centres, and arranging transportation for them, may serve the need better, and also save some scarce resources.

Development into area tuberculosis centres involves (i) starting of clinic service from tuberculosis hospitals and sanatoria, (ii) adding staff and facilities to existing clinics and (iii) improving functions including records and reporting.

Area tuberculosis centres are primarily specialised service centres. Though their staff are well trained, they are likely to be too busy for undertaking planning, programme implementation, training and supervision, which are reserved for CTO (B 5 to 9). Besides service, they act as referral centres for the area general health institution, assisting and guiding them if necessary, and they collect and collate their reports for submission to the CTO besides defaulter actions.

4. The CTO may constitute a technical working committee comprising heads of all the area tuberculosis centres to consider and advise on the day-to-day problems of CTP.

5. The CTO ensures that each area tuberculosis centre at least has the facilities and staff (except BCG team) expected of a DTC. The well trained staff do not however function as they do under DTP but according to the CTP manual (A 5). And each general health institution participating in CTP has the facilities envisaged for peripheral health institutions under DTP, to ensure a kind of uniformity in respect of minimum facilities and standards of work. The onus for providing some facilities over and above the stated minimum is entirely that of the institutions concerned. The CTO does not provide any resources for the latter.

While the area tuberculosis centres (not general health institutions) that do not satisfy the stated minimum are developed further by means of equipment, staff etc, the well developed ones are put to better use by allocating them bigger areas and responsibilities, over and above the normal to render service to larger sections of the population (B 3).

6. General health institutions are an integral part of the institutional network that provides service under the CTP. In each area, general institutions are assisted and guided in tuberculosis work by the area tuberculosis centre (B 3). The initiative for planning, setting up the organisation for tuberculosis work and programme implementation however comes from the CTO who has one or two tuberculosis control teams under him for the purpose.

7. General health institutions usually face some problems of their own for participating in CTP. While the broad issues are discussed and decided by the CCA, with heads of general institutions as co-opted members (A 2), the day-to-day problems are solved through mutual consultation between the institution concerned and the area tuberculosis centre; the CTO assists them as and when necessary.

8. Generally speaking, institutions are free to devise their own records. At the same time it is imperative that information necessary for the common reporting to CTO (C 13) is available in the records. In fact, the links that connect the network that is CTP are (i) uniform common reporting (ii) one tuberculosis case-index and (iii) a central procurement and supply organisation, all under the CTO. When institutions are revising their records to implement CTP (C 13), it is well to remember the advantages of having the same or similar records in all the health institutions.

9. A single authority following a uniform method of supervision, coupled with correctly maintained common records and reports go a long way to ensure high standards of work. Periodic supervision is exercised by CTO and his tuberculosis control teams (D 3). Assessment is undertaken through the programme directorate at the state and national levels (D 3).

10. The CTO is responsible for setting up and maintaining the city tuberculosis case-index (a live one if possible). It is not necessary to have a separate system of notifications to feed it; routine monthly reports from area tuberculosis centres should be adequate to provide the names of all the newly diagnosed patients and treatment information on the old ones (B 3).

11. The setting up of a central supply and equipment repair organisation is made possible by generous grants from the government and full support from the programme directorate (ensuring assistance from international agencies, wherever necessary). Through wise planning and advance procurement actions, it should be possible for the CTO to ensure that no institu-

tion is deprived of adequate supplies of BCG vaccine, drugs for sputum positive patients at least stains, cards and forms etc. For repair and maintenance of equipment, fully qualified technical hands and spare parts are necessary; STCs are already expected to have them (D 1).

12. A periodic review of CTP and discussion of the unresolved problems of mutual relationships and co-ordination by the CCA is arranged by the CCO on the basis of written reports received from area tuberculosis centres. Its periodicity depends on the needs but it should be yearly in any case. The meeting of technical committees (A 1, B 4) are more frequent.

C. Technical Plan

Case-finding

The imperative need for doing sputum examination carefully and repeatedly cannot be stressed more than it deserves.

1. Dispensaries and small general health institutions with daily new outpatients attendance of 50 and more offer only sputum smear examination to all who among them have chest symptoms, specially cough of more than two weeks (so called "symptomatics"). Still smaller institutions prepare sputum slides for examination at the nearest institution equipped with a microscope.

Symptomatics who are sputum smear negative on repeated examination are referred to the area tuberculosis centre for chest X-ray preferably after selection based on history of illness and clinical examination.

2. Large general health institutions already equipped with X-ray machines (not fluoroscopy) offer chest X-ray to their symptomatics, invariably followed by sputum microscopy to those with suggestive shadows in their skiagrams. While installation of photo-fluorographic cameras in institutions with daily chest X-ray load of 20 and more is welcome, this need not be arranged by CTO under the CTP.

Occasionally patients themselves, but normally X-ray films of patients where diagnosis is not clear at general health institutions, are referred for opinion to the area tuberculosis centre.

3. All area tuberculosis centres offer photo-fluorography to outpatients who attend either on own initiative or on referral, without exercising any selection, followed by sputum

microscopy to the eligibles. Centres that already have culture facilities could offer culture to those negative on smear but with suggestive X-ray shadows. Selected patients could also be kept under observation (with or without symptomatic treatment) till diagnosis is established. There need not be uniformity among tuberculosis centres in this respect.

4. Examination of population or selected groups of asymptomatics at present is outside the scope of CTP. For such activities resources are not given by CTO. Such an activity, if carried out for any reason must be excluded from case-finding reports in order to avoid confusion, but cases put on treatment are indexed and included in the reports.

Opinion on the referred patients must be sent direct to the referring institution/private practitioner: area tuberculosis centres must be careful on this point in the interest of mutual co-operation and harmonious relationship.

Case-Holding

The justification for case-finding is the ability to hold the discovered cases on proper treatment.

5. Sputum positive cases receive priority with regard to the choice of drugs and drug regimens, defaulter retrieval and prescribed period of treatment. It is imperative that their needs are ensured first before allocating resources to about four times the number of abacillary patients likely to be diagnosed with wide spread X-ray facilities.

6. The choice of drugs is restricted to primary antituberculosis drugs. And drug regimens to the standard regimens under NTP.

7. Domiciliary treatment is the sheet anchor of patient management: The comparatively small number of patients who eventually would need institutional care are systematically filtered out by the CTP network and referred to the allotted tuberculosis hospital (s) for surgery and or treatment with second line drugs (C 8, D2).

8. All CTP institutions offer standard domiciliary treatment, *free* to all (C 6). This is likely to discourage patients to migrate from one centre to another. Providing free institutional treatment is outside CTO's purview. Government may, however, reserve some beds for poor patients recommended by CTP.

Some specialised institutions already have peripatetic or satellite treatment centres in

different parts of the city. These have little meaning or advantage when most general health institutions form part of the CTP network.

9. Defaulter retrieval under CTP is best restricted to infectious patients and is two tiered. General health institutions normally write post cards for defaulter actions and may use their general home visiting staff for defaulter retrieval. Names and addresses of those not retrieved are conveyed to the area tuberculosis centre for proper home visiting and remotivation.

10. Follow-up of patients is on an agreed and uniform pattern (CCA responsibility); sputum smear examination every six months is the basic minimum, a yearly X-ray of chest when possible and sputum culture quite optional.

BCG Vaccination

11. All area tuberculosis centres offer BCG vaccination to the public in general as well as children among their routine out patients attendance.

The staff of all maternity hospitals/paediatric departments/outpatients and well-baby clinics are trained by CTO, for offering BCG vaccination as a routine service to the people. The offered vaccination is primary and direct preferably simultaneously with small pox vaccination. Care is taken that a sufficient number of staff (nurses, midwives, etc) are trained in each such institution to allow for rotation of duty, leave of absence etc.

12. The CTC with co-operation of area tuberculosis centres arranges Mass BCG Vaccination among the population according to the accepted policy and practice under NTP.

Records and Reports

13. General health institutions report to the area tuberculosis centre which in turn reports to the CTO (B 3).

Since the CTP forms a part of NTP, the basic information structure has to be uniform (B8).

The area tuberculosis centres modify their existing records to accommodate the additional information needed for national reporting. In so doing they devise their own records in a way that their own and the programme needs are met. They advise general health institutions

also to revise their existing records to permit uniform reporting.

Records and reports, especially from general health institutions, must be simple and minimum. The CTO must be associated with the revision of existing records; in doing so he also looks to the needs of supervision to be done by him.

CTO reports to the programme directorate, at the state and national levels as per the standard report forms, from the information in the city tuberculosis case-index.

14. The city tuberculosis case-index is maintained on the basis of reports received from various area tuberculosis centres; the procedure and form of reporting and how duplication of registration is avoided is decided by the CTO. It is the source of reports to the programme directorate. At present the frequency of reporting to the programme directorate is quarterly but reporting to the CTO from CTP must remain monthly. During supervision the CTO checks the correctness of the reports received by him.

D. Miscellaneous

1. In some big cities are located the so called "TB Demonstration and Training Centres". Some of them may already be functioning as State Tuberculosis Centres (STC) that perform honourous functions under the NTP: (i) they organise model DTPs, for demonstrating the programme to health workers and to train medical students, (ii) assess DTPs in the State, which will now include CTPs also, excluding the one where that STC is the leader unit, (iii) offer referral culture laboratory service, (iv) undertake equipment repair and maintenance, (v) undertake consultancy services and (vi) do research.

Selecting an STC as the "leader unit" for CTP and delegating CTO's responsibilities to it (A 3) offers a number of advantages that have to be weighed by the CCA.

2. It is seldom that there is need to increase the number of TB beds in big cities to promote CTP. Attempts often made to (i) attach a few beds to each area tuberculosis centre or (ii) increase TB beds to arrange better distribution of the beds in different parts of the city or (iii) add beds in existing sanatoria to satisfy the apparent demand for hospitalization need to be discouraged since that objective can be met through optimal and more organised use of the existing beds. The CCA could recommend (i) a more strict admission and discharge policy,

(ii) admissions and discharges decided by a Committee comprising heads of all area tuberculosis centres, offering domiciliary treatment, tuberculosis sanatoria, offering institutional treatment and the CTO (B 4), (iii) and more effective arrangements for post-discharge care of the patients under the CTP. It should not be difficult to meet the institutional treatment needs of the big city and the surrounding districts with existing beds but admissions from outside CTP area need not necessarily be regulated by CCA policy.

3. Supervision is done by CTO with the help of tuberculosis control teams under him. It should be possible, with slight modifications if necessary, to use the standard supervision forms and the frequency as well as work patterns obtaining under the NTP.

For assessment, the CTO seeks the cooperation and participation of the programme directorate at the state and national levels.

Corrective actions arising out of supervision and assessment are taken by the CTO. Supervision and assessment reports are also discussed by the CCA, or the technical groups (A 1, B 4).

4. If a big city has active non-official voluntary organisation(s), its co-operation is sought for (i) extending financial assistance to the poor and needy patients (ii) re-motivation of defaulting patients where defaulter actions have failed, (iii) community health education, (iv) help during mass BCG vaccination of population groups and (v) contribution towards crucial supplies such as anti-microbials or spinal braces etc. If there are technical institutions run by the voluntary agencies, these would already be a part of the CTP net work.

5. If there are medical college(s)/nursing school(s) in a big city, it is obligatory on the part of CTO to see that students in addition to training in tuberculosis hospitals/sanatoria receive training in the working of CTP/NTP and appreciate the respective roles of specialised and general health institutions.

6. Special training courses for general practitioners (through the local IMA), seminars and conferences of tuberculosis workers are also arranged by the CTO.

Summary

A City Tuberculosis Programme (CTP) has been suggested that meets with most of the existing conditions in our big cities and is in

accord with the principles underlying District Tuberculosis Programme and National Tuberculosis Programme.

Acknowledgement

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NOTE ON URBAN TUBERCULOSIS CONTROL PROGRAMME*

The general principles of tuberculosis control are unexceptionable, true under all situations and of universal application. The national tuberculosis control programme is also based on these principles as far as they can be implemented with the existing resources in large parts of the country. The need for urban control programme arises because the resources that are available in the large cities in the country are considerably more than in the predominantly rural areas. All health services including tuberculosis services have, till recently been concentrated in urban areas of the country so that whereas practically no facilities were available for diagnosis and treatment of tuberculosis in the rural areas till recently, such is not the case in the urban areas. Furthermore, the urban population is more knowledgeable, sophisticated, vocal, health conscious and already used to a certain standard of service. Therefore, some components of the national control programmes as operating in the rural areas at present (advocated because nothing more is possible) may not be acceptable in the cities since considerably more is already available. While a patient may not be diagnosed tuberculous in rural areas if sputum is negative, such an approach will not be acceptable, if advocated to-day, in the urban areas. It is with this background that the following recommendations are being made about the components of the urban control programme.

2. Although all district headquarters are eligible to be designated 'urban' areas in the accepted sense of the word, yet for the purpose of tuberculosis control, the word 'urban' in this document, is taken to represent state capitals and other big cities where the provisions of the district control programme may not be enough.

3. The pattern of tuberculosis services is extremely variegated in the country at present. The number of existing clinics in big cities varies considerably. In some cities, all clinics are run by one authority, in others several authorities including voluntary organisations run clinics. In some cities one officer is responsible for the entire tuberculosis service in the city, whereas in some others there is no unified control, nor even a Committee to co-ordinate the activities of the various clinics and hospitals. On the whole, the service in most cities is not

adequate. The aim of the urban control programme should therefore, be to expand, modify, re-orient the existing services with a view to earn bigger epidemiological dividends.

4. The essential components of a control programme are :

- (a) Prevention of disease in the uninfected through BCG in a comprehensive and continuous programme.
- (b) Finding out as many unknown cases, specially those with positive sputum, as quickly and as cheaply as possible.
- (c) Treating them as effectively as possible with a view to make them safe for the community.
- (d) Co-ordination between tuberculosis hospitals, clinics, general health institutions and private practitioners.
- (e) Amelioration of socio-economic difficulties which may hamper successful treatment in the case of poor patients.
- (f) Health education in the community.

5. Industrialization and increasing trends towards urbanization have recently changed the living conditions in cities considerably. Slums have multiplied in and around the large cities. Fifteen years have passed since the last national sample survey and the impact of the above change on the prevalence and trend of disease is not known. Therefore, for proper planning of a programme for the large cities, it is desirable to repeat a prevalence survey again, at least in some cities if not in all. If a re-survey is carried out on a national basis again this objective will also be fulfilled.

6. BCG Vaccination

Most births in the big cities to-day take place either in Maternity Hospitals or are supervised by the staff of Maternity and Child Welfare Centres. BCG vaccination soon after birth should, therefore, pose no problem in this group as it can be achieved satisfactorily with the help of BCG technicians and the staff of the Maternity Hospitals and Child Welfare Centres properly trained in the technique of vaccination. Births which are supervised by untrained midwives and are not inconsiderable even in large cities have however also to be provided for. Vaccination of

* Document prepared by the Standing Technical Committee of Tuberculosis Association of India and submitted to the Government.

these infants could be achieved through the BCG technician and the small pox vaccinator visiting the homes systematically as soon as the births have been notified. Steps should also be taken to teach the intradermal vaccination technique to all small pox vaccinators so that instead of two technicians visiting the home, only one can give both immunizations.

Second priority in the vaccination programme should be given to new entrants to the schools and uninfected household contacts of known tuberculous patients. In all categories BCG vaccination can be given without pre-vaccination tuberculin test.

7. Case-finding

Theoretically speaking all institutions where diagnostic facilities exist should serve as case-finding centres. It is true that the first place where a tuberculosis patient usually attends is either a general health institution or a general practitioner's office and not a tuberculosis clinic. Therefore, diagnostic facilities should logically be provided in all general health institutions as is being advocated for the rural areas. However, the working conditions of the general health institutions in an urban area must also be taken into consideration. Practically all health institutions in cities are over-worked and understaffed. To expect them to undertake sputum examination till the staffing position improves will be unrealistic and merely platitudinous. To provide a member of the staff exclusively for tuberculosis work in such institutions, which are very large in number in the cities, will be uneconomical.

Further, most of the patients do not require more than 2-3 visits to the clinic for diagnosis. Communications in a city being not bad, these visits do not entail much hardship. Moreover, if every sputum negative case has ultimately to go to a tuberculosis clinic for x-ray examination (and such cases are not less than 4/5th of the total symptomatics) examination of sputum at the general health institution will not lead to much saving. Therefore, it is recommended that while the long term target is to provide diagnostic facilities in all general health institutions, case-finding may, for the present, be mainly at the specialized tuberculosis clinics and those general hospitals and dispensaries where laboratory and x-ray facilities are already provided. Dispensaries where such facilities do not exist, should be motivated to refer all symptomatics to the nearest specialized clinic. A properly organized 'Referral System' should be developed and operate from all such dispensaries.

Active case-finding should be given priority in certain special groups e.g. persons with cough of about 4 week's duration, especially in the slums; industrial workers; diabetics; pregnant women; household contacts of known TB patients etc.

8. Treatment Organization

It is understood that drugs, in adequate quantities will be made available in each Clinic for free distribution to patients who cannot afford these. For effective treatment today, drug collection has to be made as easy for the patients as possible and an efficient organization to prevent drug default has to be provided. Whereas diagnosis does not require more than 2-3 visits, treatment requires many more visits to the clinic, say once a month for two years for drug collection. This may lead to drug default, if the working hours of the clinic clash with the patient's working hours. It is therefore desirable for a city clinic to have a number of drug distribution centres located at convenient points in the region to facilitate drug collection by the patients. Since the conditions may vary widely from city to city, pattern of working and staffing of these sub-centres may be in accordance with conditions obtaining in any city. These drug distribution centres may profitably be located at the general health institutions even if it is not possible under the existing working conditions for some of these institutions to take up drug distribution through their own staff. A satisfactory procedure, if feasible, would be for the health visitor working in that sub-area, to carry out drug distribution. As time goes by and working conditions and staffing pattern in the general health institutions improve, and machinery for default action is also available, general health institutions should serve as full-fledged treatment centres.

9. Co-ordination between tuberculosis hospitals and clinics

Domiciliary treatment being the sheet anchor of management of pulmonary tuberculosis today, a re-orientation of the functional relationship between tuberculosis clinics and hospitals is called for. There should be no such thing as routine admission. Hospitalization, broadly speaking, should be recommended where a situation, medical or social, exists which cannot be satisfactorily dealt with in the patient's home. The following are recommended as indications for hospitalization in order of priority:-

- (a) Admission on emergency basis should be made available in the following conditions :-

- (i) Patients having profuse and frank haemoptysis and recent spontaneous pneumothorax. Mere tinged sputum or spontaneous pneumothorax of some standing, with or without empyema but not needing any emergency treatment does not however entitle a patient to admission on emergency basis.
- (ii) Miliary/Meningeal tuberculosis
- (iii) Moribund patients with advanced disease.
- (b) Patients fit for surgical treatment.
- (c) Sputum positive cases who either have no home or no one in the home to look after them.
- (d) Patients with severe toxæmic symptoms, complications e.g. diabetes, the control of which requires intensive supervision not possible in a domiciliary service, and several drug reactions.
- (e) Patients who continue to be sputum positive inspite of 2/3 months domiciliary treatment.

Admission should depend on the urgency of the indication rather than seniority in registration at a clinic. The patients should be discharged as quickly as possible after the indication for admission ceases to exist. Furthermore, the admission to hospital beds should be controlled by a Committee consisting of senior members of the staff of hospital and the feeder clinics.

10. Co-ordination between specialized institution and general health services

General practitioners constitute a very important segment of medical services in a city. Some patients, no matter how efficient the service at the tuberculosis clinic is, would choose to take treatment from the general practitioners. Apart from frequent refresher and reorientation courses and motivation through their associations, facilities must be provided to general practitioners to take up treatment of tuberculosis patients under their care efficiently and on scientific lines. It should be made possible for them to send their bonafide patients with suspicious symptoms for x-ray and sputum examination at the clinics, either free or at a nominal cost. They should also be encouraged to take the help of the clinics in periodic assessment of their private patients. In order to retain the confidence and co-operation of the general practitioners, such patients' homes should not be visited by the clinic staff. In return the general practitioners should notify to the TB Clinic when a patient under his

treatment becomes a defaulter so that the clinic may retrieve that patient, if possible.

Since many tuberculous children attend pediatric departments of general hospitals rather than TB clinics, a close liaison must be established between all specialized TB clinics pediatric units.

Co-ordination between TB clinics and hospitals on one hand and general health institutions and private practitioners on the other hand should be achieved through a Co-ordination Committee on which all participating units including the Medical Association should be represented. Such a Committee should provide the leadership for the control programme in the city.

11. The voluntary organizations have an important role. Their main activities in a city should be health education of the community, supplementing the clinic's efforts in preventing drug default and organising BCG vaccination and case-finding etc., removing socio-economic difficulties which may hamper treatment of some poor patients and promoting TB Seal Sale and other fund-raising activities. It is the responsibility of voluntary organizations to see that the public accepts and participates in the control programme.

12. One clinic can effectively serve a population of 500,000 to one million in large cities. Some large cities may have, even at present, more clinics than the above estimate. Therefore, no fresh clinics should be started in such cities unless the existing number is inadequate. The whole city should be divided into well-defined regions, each region being attached to a TB Clinic. Each Clinic should be independent and function almost like a DTC under the NTP. Patients from each region should ordinarily be required to attend the regional clinic only.

There should be full co-ordination in the working of all clinics and equalisation of available services in all of them as far as possible, without which regionalization is not likely to succeed. The clinics may continue to use forms etc. already in use but the minimum information needed at the time of reporting must be easily available from the forms in use and meticulous record-keeping must be insisted. With a view to co-ordinate their activities and also to have an overall picture of the problem in the entire city, each clinic would have to submit a periodic report on its working in a prescribed form to the Tuberculosis Control Officer (vide para 13 below).

13. Tuberculosis at present does not appear to be getting the same attention and priority as it merits. It must be somebody's statutory responsibility to provide efficient tuberculosis service in the cities. This responsibility may vest with the State Government or with the local Municipality who will not only provide adequate funds but will also see that the programme, as designed, is fully implemented.

In addition, the city should have a Tuberculosis Control Officer. If all clinics are under one authority, the tuberculosis control officer may directly supervise and co-ordinate the activities of all the clinics on behalf of the statutory authority and provide the requisite leadership for implementation of the programme. If all clinics are not under one authority, leadership

may vest with a small committee on which all agencies which are running the clinics may be represented. The Tuberculosis Control Officer will then draw his authority and instructions from this Committee.

Regular assessment of the programme is as important as co-ordination and supervision. The assessment will also be the responsibility of the Control Officer. All clinics will have to submit periodical reports to the Control Officer on prescribed proforma indicating the amount of work done by the clinics during any specified period. Furthermore, easy criteria such as new cases diagnosed as a clinic and the percentage of bacillary cases converted as a result of treatment, will have to be adopted to assess the activities of the various clinics from time to time.

URBAN NEIGHBOURHOOD CLINICS IN THE MANAGEMENT OF PULMONARY TB — PRELIMINARY REPORT

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Introduction

Management of chronic diseases where administration of drugs is essential for a long period and much after subsidence of symptoms, poses several practical problems.

A majority of urban patients of pulmonary tuberculosis are either daily wage earners or self employed. In hospitals, procedural delay, heavy rush, and the consequent inadequate personal attention, leads to default till the symptoms reappear.

Keeping in view the problems of daily wage earning patients, and to detect the new symptomatics, it was felt essential to organise medical service near the patient's homes, at an easily approachable and well known community centre. Such centres of medical care and service have been named as URBAN NEIGHBOURHOOD CLINICS. Six such clinics were started in thickly populated areas within the municipal limits of Agra. The present paper gives the details of two months' working of such clinics.

Working

These clinics are located at important public places such as dispensaries which are widely known in that area with adequate space, lighting arrangement, and running water facilities.

During morning hours from 7 to 9 Health Visitor Trainees visited the homes of defaulters and patients on monthly treatment, to remind them for drug collection from their respective NEIGHBOURHOOD CLINIC during evening hours between 6-8 in summers on all week days (during winters the hours may be advanced by an hour). Only those patients who had completed three months initial treatment from the T.B. Demonstration Centre were referred to Neighbourhood Clinics for drug collection. Each clinic was visited by a doctor daily to ensure proper working, consultation and immediate solution of problems, if any.

A number of new symptomatics from the locality were referred to the Centre for investigations. In order to make our humble contribution to the Family Planning Programme, all married patients in reproductive age group were

referred to the Family Planning worker, allocated to that area and working in co-ordination with that clinic.

All the Neighbourhood Clinics were equipped with the following items :-

- i. Case files
- ii. Weighing machine
- iii. Sterilization equipment
- iv. Drugs like Isoniazid, Thiacetazone, Streptomycin, Fersolate and Yeast for 100 cases at a time
- v. Syringes and needles
- vi Stamped referral slips
- vii Forms and Cards
- viii Sputum containers for spot and over-night collections
- ix. Slide making and fixing material

Results

The Neighbourhood Clinics became fairly popular soon after their establishment. It was found that the total attendance at the clinics was 1615 in 49 working days. There were 1018 current cases taking regular treatment, 272 defaulters were retrieved within one week of default, 123 new cases were referred to the main centre and 202 contacts attended the clinic for tuberculin testing, clinical exam, and BCG vaccination wherever necessary. A number of cases (97 patients) were given active Family Planning service.

In the first month only 529 cases attended the Clinic but in the second month the number of cases rose appreciably to 1086. Table I shows an overall increase in the attendance of patients in all the clinics. The largest number of attendance at a single clinic was 337 and the poorest being only 200.

Discussion

It was found that the URBAN NEIGHBOURHOOD CLINICS became very popular amongst the working class as they saved them from a number of problems. Evening working hours of clinics spared the working hours of the patients and hence saved them from absence of work and cut in their daily wages.

The concept of Neighbourhood Clinics is to

Number of patients utilising neighbourhood clinics

Neighbourhood clinic	Drug collection			Defaulter retrieval			New case detection			Contacts examined		
	Ist month	IInd month	Total	Ist month	IInd month	Total	Ist month	IInd month	Total	Ist month	IInd month	Total
A	46	110	156	21	26	47	5	11	16	7	21	28
B	37	99	136	11	17	28	3	10	13	5	18	23
C	67	138	205	19	21	40	11	17	28	14	28	42
D	63	147	210	23	27	50	9	21	30	17	30	47
E	33	88	221	27	31	58	6	11	17	5	17	22
F	61	129	190	21	28	49	5	14	19	13	27	40

Table showing the analysis of multifarious activities during two months of work of the neighbourhood clinic.

provide medical care and facilities near patients homes at hours convenient to the patient. The time most convenient to most of the patients is the evening after the days work.

A number of new patients came of their own and some were referred by the old patients. It was found that more personal attention could be given to the patients in respect of symptoms, drug reactions and other day to day medical problems. The working of Neighbourhood Clinics ensures regularity in collection of drugs. Urban Neighbourhood Clinics have a role in Family Planning Programme as it was found that a number of patients accepted Family Planning advice which they had refused earlier. A convenient referral system from the Neighbourhood Clinic to the Main Centre saved the patient from standing in a long queue and waiting for his turn to come for registration.

There are no such clinics anywhere in the state of Uttar Pradesh. An eight week trial run of Urban Neighbourhood Clinics at Agra demon-

strated their popularity which was seen in increased attendance during second month. The staff employed in the clinics became very popular amongst the working class and self employed persons of the locality. Such clinics make it very easy for the patients to avail the facilities extended by the District T.B. Clinics and ensures protection of susceptible population in congested areas. Opening of such clinics in other parts of the State and country should go a long way in Tuberculosis Control Programme

Summary

URBAN NEIGHBOURHOOD CLINICS were established for drug distribution, retrieval of defaulters, new case detection and contact tracing in the thickly populated areas of the town. A two month working report is presented and the role of such clinics in the National Tuberculosis Control Programme is discussed. Opening of such clinics in other district towns is suggested.

NEUROTUBERCULOSIS — HISTOPATHOLOGICAL STUDY OF 90 CASES

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Tuberculosis of the nervous system is one of the common diseases met in clinical practice in our country. The clinical manifestations of neurotuberculosis are legion and are the result of interaction between varying degrees of virulence of the organism and resistance of the host. In addition, the predominant site of involvement of the nervous system plays a significant role in the production of symptoms. The role of the various tuberculostatic drugs and corticosteroids which are being widely used is yet to be fully evaluated. Dastur and Wadia (1969) have described the pathology of spinal meningitides and Dastur et al (1970) have reported on the gross pathology of the brain and meninges in tuberculous meningitis. Ghosh (1963) has described the histopathological features in 11 cases and attempted to compare those of the eight treated with three untreated cases. In our endeavour to study the clinico-pathological aspects of neurotuberculosis and the pattern of evolution of the disease under different conditions, as a preliminary step, we have reviewed the histo-pathological findings in all cases of neurotuberculosis to-date.

Material and Methods

The material consists of tuberculous lesions of the central nervous system in 90 cases, drawn both from the autopsy (71 cases) and biopsy (19 cases) material seen from 1963 to-date. Routine paraffin sections were used for histological studies. Apart from haematoxylin-eosin stain, Ziehl-Neelsen, Von-Gieson's, Verhoeff's and Griedly's fungal stains were used.

Among the 90 cases, 59 were of typical tuberculous meningitis, 19 of classical tuberculomas of the brain, and 12 of spinal granulomas. The results of the study will be described under three headings.

Results

Tuberculous Meningitis

The age of these patients ranged from 1 to 50 years. There were 39 males and 20 females. All of them had died after receiving varying amounts of anti-tuberculous drugs and were autopsied. extra-neural tuberculous lesions were found in 45 of these cases, the organs involved being the lungs (36 cases), lymphnodes (17 cases),

spleen (14 cases), liver (13 cases), kidney (5 cases), intestine (5 cases), fallopian tube (3 cases) and the ovary, uterus and adrenal (one each). The macroscopic appearance of the exudate was similar to that described in the literature and was confined to the basal cisterns in all cases and in one case it was found extending along the sylvian fissures on to the cerebral convexity. The leptomeninges were grossly thickened with organised exudate in 53 of these 59 cases. Small tubercles of one millimeter diameter were found in 29 cases in the basal cisterns, mostly confined to the interpeduncular fossa.

Histology

The tuberculous granulomatous reaction consisted essentially of epithelioid cells, Langhans type of giant cells, lymphocytes and plasma cells. Caseation was not a frequent finding and was present only in 15 cases. In the rest the reaction was essentially cellular and fibrosis was found at the periphery in 20 cases (Fig. 1). Smears of the basal exudate were examined in 20 of the cases for acid-fast bacilli, which could be demonstrated only in 10 cases. The choroid plexus was examined in 20 of these cases of tuberculous meningitis and of these only 5 cases showed typical tubercles histologically (Fig. 2).

Vascular Changes in tuberculous meningitis

The vessels traversing the meningeal exudate

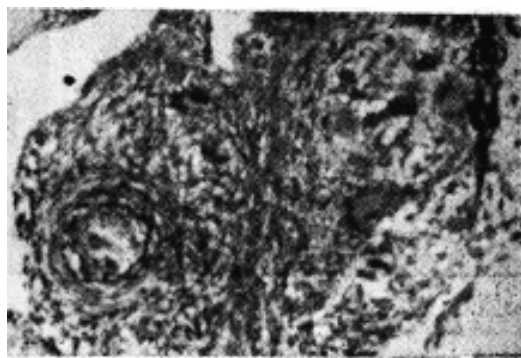


Fig. 1.

Photomicrograph showing typical tubercles with vascular thickening H & E x 80.

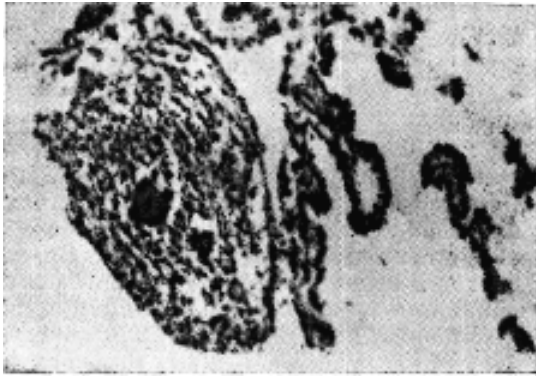


Fig. 2.
Typical tubercle seen in the choroid plexus
H & E x 80,

were involved. The vessels of the circle of the Willis and its branches were mainly affected. Macroscopically adventitial elevation was not a gross feature but histologically the adventitia was densely infiltrated with epithelioid cells, lymphocytes and a few plasma cells in 25 cases. Infiltration of the media with lymphocytes was found in 10 cases. The intimal lesion consisted of slight lifting up of intima by the exudate with infiltration of mononuclears. No reduplication of the internal elastic lamina was made out in any of the cases by Verhoeff's stain but fibrosis was made out in a few of them. Complete obliterative endarteritis was not met with. Thrombosis was not encountered in any of these vessels. No tubercles could be made out in the intima but in eight cases there were tubercles over the adventitia (Fig. 3).



Fig. 3.
Markedly thickened blood vessel with tubercle in
the adventitia. H & E x 200,

Tuberculoma

12 of the tuberculomas were in the cerebellum

and 7 were in cerebral hemispheres. The age of the patients ranged from 3 to 30 years and the sexes were about equally involved (10:9). The tuberculoma was solitary in 18 cases and in one there were three, one in the cerebellum and two in temporal lobe. They were typically hard, nodular measuring 3 cms. to 12 cms. in diameter and were either rounded or nodular. Cut section revealed frank caseation in 10 cases and in the rest cut surface was firm with minimal necrotic changes. Acid-fast stain revealed bacilli in only one of these cases. Histologically they consisted of central core of caseation surrounded by tubercles of typical histology with a well organised fibrous capsule.

Vascular changes in tuberculomas

The vascular changes were seen surrounding the caseated areas. The adventitia showed a thick ring of collagenised fibres. The intima was very much thickened and fibrosed and in a few cases concentric thickening could be made out. Medical changes were minimal. Due to the intimal fibrosis there was gross reduction in the lumen of the vessel in 14 cases, of which 5 showed complete obliteration of the lumen.

Tuberculous Spinal Granulomas

Among the 12 granulomas, 8 were intra-dural, one was intra-medullary and 3 extra-dural. The age of the patients ranged from 1 to 40 years. There were 6 males and 6 females. Seven cases were in the dorsal region, 2 were cervical and 2 were lumbar.

The granulomatous reaction histologically comprised of nodular accumulations of epithelioid cells, lymphocytes and plasma cells and giant cells of the Langhans type. There was minimal fibrosis and no caseation. The vascular changes were characterised by accumulations of epithelioid cells, lymphocytes and mononuclears in the adventitia, minimal changes in the media and thickening of intima. None of the cases revealed any thrombi or complete obliterative endarteritis. Fibrosis was seen around the blood vessels at the periphery of the tubercles.

Discussion

An attempt was been made to compare our histological findings with those of previous authors (Ghosh, 1963; Dastur and Wadia, 1969). However, this has not been very helpful, because the series were not truly comparable. Ghosh (1963) studied 11 cases of which 8 were treated and 3 were untreated. Dastur and Wadia (1969) confined their study to spinal meningitides.

Ours on the other hand is a retrospective review of cerebrospinal tuberculous lesions of different varieties.

Tuberculous meningitis

Essentially, the histological picture consisted of tuberculoid reaction. Caseation was present in only 15 cases in this series, a finding at variance from that of Ghosh (1963) who found caseation to be a prominent feature in these cases, though it was lesser in amount in those who received the three anti-tuberculous drugs. The fact that our cases received varying amounts of these drugs before their death may account for this. A significant amount of fibrosis was found at the periphery of the tubercles in a third of our cases. Tubercle bacilli were found in 10 of the 20 cases in whom the basal exudate was specifically studied by the acid-fast stain. Ghosh (1963) found bacilli in 5 of his & cases.

The blood vessel changes were noted essentially in the basal vessels engulfed in the exudate (Ghosh, 1963; Dastur et al, 1970); Small tubercles were found in the adventitia in 8 cases. Dastur et al (1970) found such tubercles in 4 cases. The vascular lesions were essentially inflammatory and proliferative in character with cellular reaction involving all the three coats, producing varying degrees of occlusion of the lumen but complete obliterative endarteritis was not met with in our series. Ghosh (1963) found virtual obliteration of the lumen in two of his 8 cases.

Small tubercles, single or conglomerate found in the basal cisterns and occasionally in the sylvian fissure (2 cases) and choroid plexus (5 cases) probably comprise the Rich's focus in these cases. Non-identification of such lesions in other cases may be due to the difficulty of demonstrating these lesions, as they could be easily missed. Ghosh (1963) could find such tubercles in & of his 11 cases.

Tuberculomas

These are gross lesions of the size larger than 3- cms. in diameter and capable of producing neurological defects or space occupying effects. Small tubercles or conglomerates of them which were incidental findings in the basal cisterns or other parts of the brain in cases with frank meningitis are not included in this category and reference was made to them in dealing with the meningitis cases. The gross appearance and anatomical distribution were similar to those mentioned in the literature (Dastur et al, 1968 Rao and Dinakar, 1972).

Frank macroscopic caseation was present in 10 cases only in our series. Acid-fast bacilli could be demonstrated only in one case in contrast to 7% by Rao and Dinakar (1972). The histologic picture was typical consisting of caseation surrounded by giant cells and fibrosis. Vascular changes were prominent with a significant reduction of the lumen in a majority and complete occlusion in 5 cases.

Tuberculous spinal granulomas

These were all localised granulomatous lesions in contrast to the diffuse leptomenigeal reactions described by Dastur and Wadia (1969). They have described a gradation of histological picture from a florid granulomatous reaction of leptomeninges with caseation (present in 7 of the 38 cases) to more chronic forms with fibrosis and obliteration rather than proliferation of blood vessels. They also stressed on the difficulty in demonstrating acid-fast bacilli in these lesions. The histological picture in our cases was mainly granulomatous. There was no caseation in these cases. The vascular changes were mainly inflammatory in nature with chronic inflammatory cellular infiltrations of adventitis and thickening of intima and perivascular fibrosis. There was no obliteration of blood vessels.

Summary and Conclusions

A histopathological review of 90 cases of tuberculous lesions of the central nervous system has been made.

They comprised 59 cases of tuberculous meningitis, 19 cases of tuberculoma of the brain and 12 cases of spinal tuberculous granulomas. The histological features in the three types of lesions have been described.

While tubercles were the main features in all the groups, caseation was seen most often in the tuberculoma and least in the spinal granuloma.

The vascular changes were essentially inflammatory in nature in meningitis and spinal granulomas, while in the tuberculoma the changes were mainly occlusive in character.

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PATTERN OF TUBERCULOSIS — A REVIEW BASED ON AN AUTOPSY STUDY

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Tuberculosis was known to have been present commonly in the predynastic period of Egypt. A number of observers in the 16th and 18th century thought of tuberculosis as contagious. But it was Villemin in 1865, who contended that tuberculosis was an infectious disease. The final proof of infectivity and bacterial nature of tuberculosis was provided by Robert Koch in 1882 (Florey 1970). Almost every organ or tissue in the body can be involved in this disease. However, the lungs are the commonest organs involved. Tuberculosis is a disease of middle and older age groups, affecting males more often than females. In children the incidence is low, but some manifestations carry a high mortality rate. In economically developing countries, tuberculosis is one of the principal causes of suffering and death. The World Health Organisation estimates that there are at least 10 to 20 million cases of tuberculosis in the world to-day and that some one to two million people die of this disease every year. More than three quarters of the cases are in the developing countries. In view of this condition being very common in our country, a review has been undertaken of the autopsy material to study the pattern of tuberculosis as it affects the various organs in the body.

Material and Methods

Autopsy statistics of the Department of Pathology, Kurnool Medical College, Kurnool, has revealed that out of 2,734 autopsies performed during the years 1960-1971, 3&1 showed evidence of tuberculosis in one or other organs. Smears were taken from all these cases and sections were studied from all the organs with Haemotoxylin and Eosin stain and wherever possible tubercle bacilli were demonstrated not only in smears but also in sections with Ziehl-Neelson's technique.

The material was analysed with reference to the age and sex and various organs involved, with special emphasis on the nature of lung lesions which were studied in detail.

Results of Study

Analysis of the present study revealed presence of tuberculosis in 3&1 out of a total of 27&4 autopsies performed. The age and sex distribution of the cases is shown in Chart-I. 28.5 % of these were in the age group 0-9 years,

and 20 % in the 30-39 years group. The ratio of males to females was 2:1.

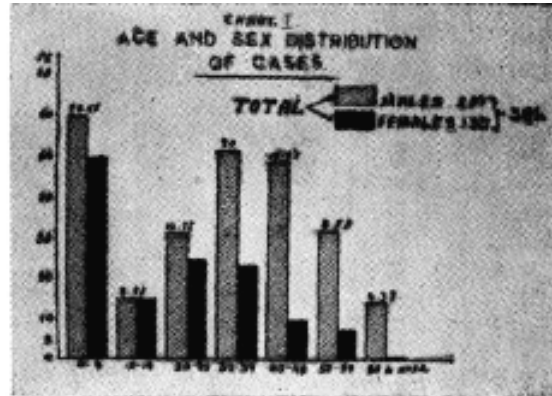
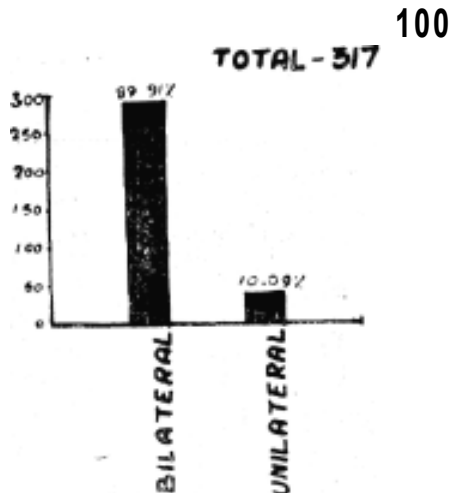


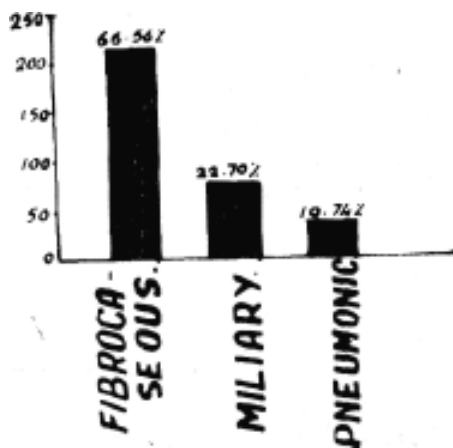
Chart-II shows the involvement of various organs. Lungs were the commonest organ involved in this study. 90% of these cases with lung involvement were admitted with history of fever, cough and breathlessness and the remaining 10% had bouts of haemoptysis along with other symptoms. All these patients received varying amounts of anti-tuberculous drugs prior to death. Both the lungs were involved in 9.91 % and unilateral involvement was seen in 10.09 % (Chart-in). The commonest type of lesion in the lung was fibro-caseous variety (66.56 %). Miliary lesions were seen in 22.70% whereas the pneumonic type was seen only in 10.74 % (Chart IV).



**CHART III
DISTRIBUTION OF LESIONS
IN LUNG'**



**CHART. IV
TYPE OF LESION IN LUNGS
TOTAL - 317
100%**



Glandular tuberculosis constitutes one of the major non-pulmonary manifestations of tuberculosis. Lymphnodes of various regions were involved in 121 cases (32%). Tracheobronchial lymphnodes were involved in 70%. Abdominal and cervical groups of lymphnodes showed evidence of tuberculosis in 26% and 4% respectively. All these lymphnodes were enlarged and matted. Necrosis was seen in some of the lymphnodes macroscopically. Histopathology disclosed typical tubercles with or without caseation and fibrosis. In 105 autopsies,

tuberculosis of lymphnodes was associated with pulmonary tuberculosis.

Gastro-intestinal tract was found involved in 57 autopsies. Males and females were almost equal among them and most of them were more than 20 years in age. The small intestine was involved in 88%. The ileo-caecal region which is one of the commonest sites of tuberculosis of the abdomen, was involved in only 4 (7%). Stomach showed evidence of tuberculosis in 2. In majority of these, ulcerative lesions were encountered oftener than the proliferative type. The mesentery, peritoneum and abdominal group of lymphnodes were involved in 10. The gastro-intestinal lesions were seen to be associated with pulmonary involvement in 45 of the autopsies.

Central nervous system involvement was seen in 93 (24.67%). Of these, 73 (78.3%) were between the ages of 0-19 years and the rest (21.7%) were beyond the age of 20 years. Meninges were commonly involved (86%) producing basal meningitis with exudate. Tuberculomata were encountered either in the cerebellum or in the cerebrum in 14%. In one of these, pituitary was involved with tuberculosis as a direct extension from the basal meningitis. Pulmonary involvement was seen in 24.5% of those with evidence of tuberculosis in the central nervous system.

Female genital system showed tubercles in 2.6% of the autopsies. Uterus, fallopian tubes and ovaries showed caseating lesions. Tuberculous epididymo-orchitis was seen in one autopsy.

Miliary lesions were seen in liver in 22.34%, spleen 15.7%, kidney 6% and adrenal 1.9%. In all these, lungs were also involved. Heart muscle showed tubercles along with tuberculous pericarditis and lung tuberculosis in one autopsy.

Discussion

Tuberculosis is a major health problem in developing countries like India. Approximately half the population of the world are infected with tuberculosis (Murray, 1966). A sample survey carried out in Bombay revealed the prevalence of tuberculosis in the population to be 5.5% (Shah et al, 1961). A review of postmortem reports from various centres in India showed that one in every eight deaths was due to tuberculosis (Begen, 1957). Post-mortem reports of 100 children from Bombay showed that in 10% the main cause of death was tuberculosis (Udani, 1960). Tuberculosis in young children is a completely different disease from tuber-

culosis in older children and adults. Tuberculin survey conducted in children below the age of 14 years in Bombay showed that 39 to 62 % were positive reactors (Udani, 1961). In this study tuberculosis accounted for 14 % of all autopsies with maximum number in children between the ages of 0-9 years.

The national tuberculosis sample survey (1955-1958) showed that prevalence of pulmonary tuberculosis in even the remote villages was about 1.5 % (Sen, 1967). Lowe and Goddes (1953) have reported a gradual decline in cases of pulmonary tuberculosis attending the Birmingham Chest Clinic from 1935 to 1952. It is estimated from the Indian Surveys that there are probably at least five million persons with active tuberculosis of lungs and in many areas 50% of the children under 8 years are tuberculin positive. Ranganathan (1962), Altmann (1963) noticed a slight fall in cavitary cases in 1960 series when compared to 1948 series. According to Govind Prasad (1970) there has been no change in the type of disease and sites involved. He noticed 98% of the cases are of fibrocaceous variety and the proportion of male patients in the age group of 20-39 years registered some increase. Present study revealed that lungs were seen in 83.2 % of the autopsies. Bilateral involvement was more common (89.91 %) than unilateral involvement (10.09 %). Adults after the age of 20 years registered an increase and males predominated over females.

The incidence of tuberculous lymphadenitis has become less throughout the civilised world. Lymphnodes are involved early in the course of tuberculosis, soon after the formation of primary complex. It is logical to assume that the involvement of glands is the result of lymphatic spread from the primary complex. All cases however cannot be explained on this basis. Haematogenous dissimilarity undoubtedly plays an important role (Lincoln, 1950). In our study lymphglands were involved in 32% of autopsies. Among these, tracheobronchial nodes were involved in 70% and abdominal and cervical nodes were involved in 26% and 4% of cases respectively.

Gastro-intestinal tuberculosis is now uncommon in Western Europe and in an increasing percentage of cases, the lesion is apparently primary (Bantley and Webster, 1967). Intestinal tuberculosis particularly secondary to Pulmonary tuberculosis remain common in India (Ukil, 1942; Anand, 1956). Ileo-caecal tuberculosis well known as the commonest type of gastro-intestinal tuberculosis (Riggins, 1942) was repeatedly shown to be usually secondary to pulmonary disease (Ashken and Baren, 1962

and Homer, 1963). Tuberculosis of the stomach is rare and it is found to be present in 0.16% of routine post-mortems (Palmer, 1950). According to Chatterjee and Dutt (1955) tuberculosis of the stomach varied from 0.35% to 2.3%. In 14% of autopsies with gastro-intestinal involvement, lungs were also involved. Ileocaecal region was affected in 4, and stomach in 2 among those with gastro-intestinal involvement.

Tuberculosis of the nervous system is one of the common diseases met with in clinical practice in our country. More often meningeal involvement is seen and tuberculomas are encountered occasionally. Dastur et al (1970) have given a masterly survey of the gross pathology of the brain and meninges in tuberculosis. Pituitary is affected usually as a direct extension from the basal meningitis. In our series meningitis was present in 86% of autopsies with CNS involvement and tuberculomas in 13 (14%) only.

Muscle tissue is usually not affected with tuberculosis though there is much vascularity. A single case is recorded where cardiac muscle showed tubercles along with involvement of pericardium and lungs.

Summary

1. 381 autopsies showing tuberculosis of various organs is reviewed and significance of these lesions has been discussed.
2. Tuberculosis was seen in 14% of all autopsies.
3. Largest number was in children in 0-9 years age group and next came adults between the ages of 30 and 39 years.
4. Pulmonary tuberculosis is the commonest and bilateral involvement with fibrocaceous type is most frequent.
5. Involvement of liver and spleen with tubercles is frequent being 22.3% and 15.7% respectively.
6. Rare sites of tuberculosis such as heart muscle and pituitary are recorded in one each of the cases.

ACKNOWLEDGMENTS

The authors thank Mr. P. Haricharanapathi, Mr. Veeraiyah and Mr. G.Prahlada Rao, Department of Pathology, Kurnool Medical College, Kurnool for their help in the preparation of this manuscript.

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CASE REPORTS

TOXIC PSYCHOSIS DUE TO ISONIAZID

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Since the introduction of isonicotinic acid hydrazide by Robitzek et al (1952), it is the most widely used antituberculosis drug because of its efficacy, cost and relative freedom from serious side effects.

Rarer serious side effects are cutaneous hypersensitivity (Tuberculosis Chemotherapy Centre, 1970), toxic psychosis, optic neuritis, optic atrophy, convulsions and death (Janssen and Boke, 1955; Dixon et al, 1956).

Case Report

A female aged 30 years weighing 45 kg. was hospitalized on 3.6.1974 with a history of productive cough and fever for 6 months. She had repeated haemoptysis 20 days prior to admission. There was no previous history of mental illness. Examination of chest revealed coarse crepitations on the left side.

Sputum was positive for AFB by smear examination. Haematological examination was within normal limits. X-ray chest showed non-homogeneous infiltrative opacities in the left upper and middle zones. She was put on the combination of Inj. Streptomycin sulphate 0.75 gm i.m. daily, Isonex 300 mg. in a single daily dose and PAS 5 gms twice a day after meals. On 8.6.74 patient suddenly became restless, irritable and exhibited emotional instability, agitation and apprehension. Fluctuation in behaviour and mood of patient was also noticed, and she reacted excessively to minor emotional experiences. She was confused, incoherent and violent occasionally, but there were no tremors and involuntary twitchings. Hyperreflexia and exaggerated jerks of lower extremities were present. Antituberculosis therapy was discontinued and patient was advised Inj. Pyridoxin 100 mgm. daily along with thiamine and cyanocobalamine. Sedatives were also prescribed. She started improving within 24 hours and become normal within a week.

On 15.6.1974 streptomycin was started with initial dose of 0.25 gm. i.m. and gradually reaching 0.75 gm. She tolerated it well. On 26.6.74 PAS was added with starting dose of 1 gm. and gradually reaching 10 gms. Patient tolerated these two drugs and remained well for nearly 2 weeks. On 7.7.74 INH was also added

to therapy with an initial dose of 25 mgm and increasing to 300 mg. per day. She tolerated 300 mgm INH for 2 days and on 14.7.74 severe psychotic symptoms developed again, though vitamin B6 was being continued along with antituberculosis drugs. INH was discontinued again and patient returned to normal within 10 days.

Psychotic phase was not accompanied by any biochemical changes. Liver function tests showed normal values.

Patient was well when therapy continued with streptomycin and PAS.

Discussion

Psychotic symptoms due to INH are rare as reported by Mandel et al (1956), 3 cases; Lepeuple et al (1959), 9 cases; Duncan et al (1962), 3 cases; and Devadatta (1966), 3 cases of which 2 were receiving INH at a dose of 13.9 mgm/kg/day.

Mechanism of production of neurological disorders is not clearly denned but it is shown to interfere with the several metabolic processes essential for the normal functions of the neurone (Holtz and Palm, 1964). INH causes deficiency of vitamin B6 by excessive excretion which in turn lead to a disturbance of normal tryptophan metabolism but the effect of drug on central nervous system probably arises by a different mechanism, so that the administration of vitamin B6 is ineffective in preventing fits, psychosis and ataxia (Adams et al 1965).

Mandel et al (1956) have shown that para-amino-salicylic acid interferes with the inactivation of isoniazid. Their reported 3 cases of INH psychosis were receiving PAS. .

Loss of memory with standard dose (Olsen and Terning 196&) and death following ingestion of 30 gms of INH (Friedman 1969) have also been reported.

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ALOPECIA DUE TO ETHIONAMIDE

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Ethionamide, in combination with other reserve drugs, is a very effective chemotherapeutic agent in the treatment of resistant cases of pulmonary tuberculosis (1-4,6,8,11,14) but it has been found to be associated with a number of toxic effects, in particular, gastrointestinal disturbances (2, 5, 7, 9, 12, 15) and hepatic derangements (5, 8, 9, 10, 12, 15). However, alopecia due to ethionamide has rarely been reported in literature.

In a study to assess the acceptability of ethionamide at different dosage schedules and frequencies of intake, 2 of 170 patients studied developed alopecia.

Case Report-1

S, 40 years, Hindu female, suffering from far advanced pulmonary tuberculosis for about 1½ years who had received standard drugs irregularly during this period, presented with positive sputum. On 23-10-71, she was prescribed Ethambutol 800 mg before breakfast, Ethionamide 500 mg after day meal and Isoniazid 500 mg daily, all in single dosages. She was responding satisfactorily to this regimen but on 5-12-71, she reported with the complaint of excessive loss of hair when combing the head. On examination, we observed falling of hair from all over the scalp. Ethionamide was thought to be the causative factor and hence it was withdrawn and Pyrazinamide was substituted in its place. The regimen was supplemented with B Complex group of Vitamins. Hair started growing again a few weeks after withdrawal of Ethionamide.

Case-Report-2

SN, 32 years, Hindu male, came to us for the treatment of pulmonary tuberculosis, for which he was suffering for the last 2-3 years. He had received irregular and interrupted treatment with standard antituberculosis drugs during this period. His sputum was found positive for A.F.B. X-ray chest P.A. showed far advanced bilateral disease. On 10-3-72, he was put on reserve drugs. Ethionamide 500 mg and Pyrazinamide 2 gms were given in equally divided doses twice a day after meals, alongwith Isoniazid in a single daily dose of 300 mg per day. On 26-3-72, he reported to us with falling of hair. Examination of scalp revealed alopecia areata (See figure). Hence, Ethionamide was imme-

diately withdrawn from the regimen and Ethambutol 800 mg per day was substituted in its place. Patient did well on this regimen. Sputum conversion was achieved with marked radiological improvement. On 18-9-72, he was prescribed Isoniazid and Thiacetazone only as he could not afford reserve drugs.



Fig. Case 2 showing alopecia areata caused by Ethionamide.

Alopecia improved gradually with growth of hair.

Discussion

Barring other factors, certain drugs such as nitrogen — mustards, sulphonamides etc., are known to cause alopecia. Amongst anti-tuberculosis drugs, Ethionamide has been reported to cause alopecia. Lees observed alopecia in 2 of 93 newly diagnosed patients treated with Ethionamide. In the series of Nagasawa et al the incidence observed was 2 per cent. A British Tuberculosis Association report (1968) mentioned alopecia in 1 of 48 patients treated with Ethionamide and in 3 of 53 patients

treated with Prothionamide. We observed alopecia in 2 of 170 patients treated with Ethionamide which necessitated withdrawal of the drug. It was similarly observed that growth of hair started a few weeks after cessation of drug. This confirms that Ethionamide had caused alopecia in 2 of our patients reported above. The mechanism, however, is not clearly understood.

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FATAL DERMATOLOGICAL HYPERSENSITIVITY REACTION DUE TO THIA CETAZONE

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Dermatological hypersensitivity reaction due to Thiace tazone is more common than other toxic reactions (Parikh, 1968). These reactions are usually mild to moderate in type. Severe mucocutaneous reaction in the form of Stevens-Johnson syndrome and toxic epidermal necrolysis, though rare, has been reported in the literature due to Thiace tazone (Tuberculosis Chemotherapy Centre, Madras, 1966; Sehgal et al, 1973; Bedi et al, 1974). The authors have seen a case who developed typical Stevens-Johnson syndrome and toxic epidermal necrolysis (Lyell Syndrome) due to Thiace tazone which was fatal in nature.

Case Report

K.S., a 37 years old house-wife, was admitted to T.B. Hospital on 22-4-74 with the complaints of high grade fever, rashes all over the body and dysphagia.

Patient was a known case of minimal pulmonary tuberculosis and she was taking Isoniazid and Thiace tazone for the preceding 25 days. Before that she had taken Streptomycin and Isoniazid therapy for two months. On the 22nd day of oral regimen of Isoniazid and Thiace tazone the patient noticed skin rashes all over the body along with fever. She continued treatment and on the 25th day she was admitted to the hospital in a serious condition.

On examination the look of the patient was toxic, she was dehydrated and having maculopapular rashes all over the body including palms and soles. The buccal mucosa and lips were ulcerated and covered with yellowish-white slough. Conjunctiva was chemosed and mucopurulent discharge was coming out.

All her antitubercular treatment was stopped and she was put on heavy doses of Dexamethasone, antihistaminics intramuscular Reverin, I/V fluids, local application of gentian-violet and other supportive measures. On the third day of her admission scattered bullous lesions were noticed all over the body. Superficial layer of skin could be peeled off very easily — Nikolsky's sign was positive. The blood pressure gradually dropped and the patient went into irreversible peripheral circulatory failure and expired on the fourth day of her admission.

Discussion

Our case of pulmonary tuberculosis who was on Isoniazid and Thiace tazone was admitted with severe hypersensitivity dermatological reaction. She was having all the typical features of Stevens-Johnson syndrome. The specific and most frequent diagnostic signs of this mucocutaneous syndrome are toxic appearance of the patient, skin rashes in the form of maculopapular or/ and vesiculobullous type, eye lesion in the form of conjunctivitis and involvement of mucous membrane of lips, buccal cavity and pharynx in the form of swelling, redness and ulceration. In our case later on, toxic epidermal necrolysis (Lyell syndrome) developed. The Nikolsky's sign became positive which was evident by extensive peeling of skin on the body surface.

In this case it was clear that Thiace tazone was responsible for these severe dermatological manifestations because initially patient was on Streptomycin and Isoniazid, had no reaction but when she was on Isoniazid and Thiace tazone therapy she had hypersensitivity reaction.

The prognosis of hypersensitivity dermatological reaction varies with the extent of skin involvement and on how early the case is diagnosed and the offending agents withdrawn and steps taken to treat the condition (Sehgal et al, 1973). A case who had developed Stevens-Johnson syndrome and toxic epidermal necrolysis certainly bears a serious prognosis.

Our case could have been saved if Thiace tazone had been stopped when the patient noticed rashes all over the body and the lesion might not have progressed to toxic epidermal necrolysis with fatal result. The course of events in our case was similar as reported by Sehgal et al (1973) and Ravindran et al (1974) in their fatal cases.

Summary

A fatal case of severe hypersensitivity dermatological reaction in the form of Stevens-Johnson syndrome and toxic epidermal necrolysis (Lyell Syndrome) due to Thiace tazone has been reported with review of literature.

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NEWS & NOTES

ANNUAL MEETING

The Thirtysixth Annual General Meeting of the Tuberculosis Association of India was held on 23rd April, 1975 at the Conference Hall of the Association. Shri S. Ranganathan, M.P., President of the Association, presided.

AWARDS

The Khushi Ram Shield in recognition of outstanding work in 1974 was awarded to the Bengal Association. Merit Certificates for good performances in 1974 were awarded to the Delhi and Maharashtra Associations.

The Seal Sale Trophy for the highest collections made in 24th Campaign was awarded to the Tamil Nadu TB Association. The Tamil Nadu TB Association collected Rs. 6,74,278.50 from this campaign. The Runner-up Cup was awarded to the Kerala TB Association, which collected Rs. 2,85,930.38. Merit Certificates were awarded to the Karnataka TB Association and to the Tuberculosis Association of Tripura, both of which improved their collections in the 24th Campaign. The Silver Cup for smaller States was awarded to the TB Association of Goa, Daman & Diu.

STANDING TECHNICAL COMMITTEE

The Technical Committee which met on 22nd April, 1975 reviewed the addresses and papers presented at the 9th Eastern Region Conference which was combined with the 29th National Conference. Referring to the discussion held with the Health Minister, when, Dr. Chadha presented the memorandum, the Committee passed the following resolution :

“The Technical Committee of the Tuberculosis Association of India express their deep gratitude to the Hon’ble Health Minister for giving a patient hearing to the representatives of the Association headed by Dr. M.S. Chadha, and record their sincere thanks to the Hon’ble Health Minister for having agreed to their suggestion to constitute a Committee of eminent experts for assessing the working of the Tuberculosis Programme in India. The Technical Committee hopes that adequate representation will be given to it on the Assessment Committee to be set up by the Indian Council of Medical Research as suggested by the Hon’ble Health Minister.

“The Technical Committee strongly urge that the question of a Second National Survey

may be favourably reconsidered by the Ministry of Health.

“The Technical Committee is greatly distressed about the totally inadequate provision made in the 5th Five Year Plan for the control of a disease like Tuberculosis, which today is the most important public health problem in this country. The Committee reciprocates the feeling of disappointment expressed by the Hon’ble Health Minister that even though tuberculosis is a stupendous problem, its control programme, unlike leprosy control programme, is not being implemented as a national programme in the 5th Five Year Plan.

“The Committee earnestly requests the Hon’ble Health Minister to take up this matter with the Prime Minister, the Minister for Finance and the Deputy Chairman of the Planning Commission and to see that the Tuberculosis Control Programme is assigned due priority as a National Programme”.

HEALTH VISITORS' COURSE

The 1975-76 TB Health Visitors' Course commenced on 1st July, 1975. Six candidates have joined the Course. The 9 months course will include five months' training in the New Delhi TB Centre, two weeks in L.R.S. TB Hospital, Mehrauli, two weeks for examination and three months' internship which will last from 1st January to 31st March, 1976 (including two weeks in a rural centre).

TWENTY-SIXTH TB SEAL

The Twenty-sixth TB Seal Sale Campaign will, as usual, commence on 2nd October, 1975, Mahatma Gandhi's birthday and terminate on 26th January, 1976, Republic Day. With a view to make the Seal more attractive and popular it has been decided that for this Campaign the Seals may be issued in four different designs as is the practice in some other countries. For the 26th Campaign the pictures of four different flowers have been selected.

NATIONAL CONFERENCE

The 30th National Conference on TB & Chest Diseases will be held in Hyderabad (Andhra Pradesh) from 8th to 12th November, 1975. Subjects selected for discussion at the Conference are : (1) Follow-up of sputum negative x-ray positive cases of pulmonary tuberculosis, (2) Short-term Chemotherapy, (3) Pyogenic Infections of the Lung, (4) Amoebic

Infections of Lung and pleura, (5) Atypical mycobacterial infections, (6) National TB Control Programme, (7) Panel discussion on 'Air Pollution' and (8) Assorted papers.

CHANCHAL SINGH MEMORIAL AWARD

The Tuberculosis Association of India will award a cash prize of Rs. 500/- to a TB doctor below 45 years of age, for an original article not exceeding 30 double spaced foolscap typed pages (approximately 6000 words) excluding charts and diagrams on a subject relating to tuberculosis. Papers may be sent in quadruplicate to reach the Tuberculosis Association of India office on or before 31st August, 1975.

ESSAY COMPETITION

The Tuberculosis Association of India will award in 1975 a cash prize of Rs. 300/- to a final year medical student for an original essay on Tuberculosis. The subject selected is the 'National TB Control Programme'. The essay should not exceed 15 double spaced foolscap typed pages (approximately 3000 words) excluding tables, diagrams, etc. Four copies of the manuscript should reach the Tuberculosis Association of India office on or before 31st August, 1975 and should be forwarded through the Dean or Principal of the College/University.

REFRESHER COURSE

The Fifth Refresher cum-reorientation course for the benefit of Matrons/Sister/Tutors of teaching hospitals for nurses was organised by the New Delhi TB Centre from 31st March to 5th April, 1975, in cooperation with the Trained Nurses Association of India. The course was inaugurated by Dr. J.B. Shrivastav, Director-General of Health Services.

CONFERENCE & SEMINARS

The Fifth Conference under the auspices of the Karnataka State TB Association was held in Hassan on the 14th and 15th June, 1975. The Dist. Association brought out an attractive Souvenir on the occasion. The Conference of Secretaries of Dist. Associations in the State suggested ways and means for improving the Seal Sale Campaign

TB DETECTION CAMP

A one-day tuberculosis education detection and vaccination camp, jointly sponsored by Rotary Club of Bangalore South and the Karnataka State Tuberculosis Association was inaugurated by the State Labour Minister, Mr. K. Sriramulu in Bangalore on 25.5.1975. About 150 persons were examined and those who were suffering from the disease were given medicines.

INTERNATIONAL CONFERENCE IN MEXICO

The 23rd International Conference on Tuberculosis will be held in Mexico during September, 1975.

SHIBIR

The 64th Anti-Tuberculosis Shibir of the Maharashtra State Anti-Tuberculosis Association was held at Chanchani, Taluka Dahanu, District Thana on Sunday the 25th May, 1975. The Shibir was a part of medico-surgical shibir arranged in collaboration with local social workers led by Mr. Rajnikant Shroff. A team of specialists and technicians led by Dr. M.D. Deshmukh examined 114 persons and vaccinated 220 children with BGG, 27 cases of TB were detected and TB germs were found in 8 sputum specimens.

THIRD NATIONAL CONGRESS ON DIABETES

The III National Congress on Diabetes will be held in Bombay from 5th to 9th November, 1975 under the auspices of the Diabetic Association of India. Applications are invited for Banting and Best Oration to be delivered at the time of Congress. For details please write to the Diabetic Association of India, Maneckji Wadia Building, 127 Mahatma Gandhi Road, Bombay-400023.

Diabetic Association of India invites nominations for the First Dr. R.V. Sathe Oration to be delivered during the Annual Meeting of the Scientific Section to be held jointly with the Association of Physicians of India, in January, 1976 at Delhi.

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ABSTRACTS

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Abst. No. 3

Rifampicin in initial treatment of Pulmonary Tuberculosis

Roe Newman, Berbuce E. Doster, Francis J. Murray and Shirley Ferebee Woolpert. Amer. Rev. Resp. Dis.; 1974, 109, 216.

Six hundred and thirty two hospitalized patients with newly diagnosed bacteriologically confirmed pulmonary tuberculosis from a number of hospitals in USA were included in a co-operative drug trial under US Public Health Service. The patients were randomly assigned to the following three regimens:

1. Rifampicin, INH and Ethambutol
2. Rifampicin and INH
3. Streptomycin, INH and Ethambutol.

The duration of treatment was 20 weeks. Both Rifampicin regimens produced sputum conversion at least two weeks earlier than the third regimen. After 12 weeks of treatment, 80% of the patients with far advanced disease and 90% with moderately advanced disease were sputum negative by culture. Radiological improvement was similar in all three regimens. Addition of Ethambutol to the combination of Rifampicin and INH was of marginal benefit.

SGPT values in many patients on Rifampicin regimens were raised but no case of frank jaundice appeared and they were all asymptomatic. The significance of the transitory elevation of SGPT is not clear. Only 6 out of 372 patients who completed 20 weeks of treatment with Rifampicin had adverse reactions severe enough to discontinue the drug.

Withdrawals from the trial for reasons not related to drugs were nearly twice as common with Rifampicin, INH and streptomycin and INH, Ethambutol regimens (about 12%) as with Rifampicin, INH, Ethambutol regimen (6.6%). Problems related to the regimens resulted in withdrawal of 4.3% of patients on Rifampicin, INH, 2.4% on Rifampicin, INH, Ethambutol, and 11.7% on streptomycin, INH and Ethambutol regimens.

S.P.P.

Ethambutol-Isnniazid versus Streptomycin-Ethambutol-Isoniazid in original treatment of cavitory tuberculosis

I.D. Bobrowitz. Amer. Rev. Resp. Dis.; 1974, 109, 548.

Two hundred and twenty three previously untreated bacteriologically confirmed cavitory cases of pulmonary tuberculosis were randomly allocated to one of the following two regimens:

1. Ethambutol 25 mg/kg. for first 90 days and 15 mg/kg. thereafter with INH 450 mg once daily and pyridoxine 53 mg. daily.
2. The same as above with addition of streptomycin 1 gm. daily for 90 days.

In patients treated for 4 months or more, sputum cultures were still positive in 4% in regimen 1 and 5% in regimen 2. The only advantage of 3-drug regimen was somewhat more rapid sputum conversion in far advanced cases though ultimate bacteriological conversion and radiological response in two regimens was more or less similar. Drug related loss of patients from the study was 5.4% in regimen 1 and 21.1% in regimen 2. Drug—reactions were most frequent with streptomycin. Only one patient had neuropathy requiring stoppage of INH in spite of the dose being 450 mg. No patient had retrobulbar neuritis.

S.P.P.

Effect of meals on Rifampicin absorption

D.I. Siegler et al. Lancet; 1974, ii, 197.

Rifampicin was measured in blood and urine after 600 mg. given in the fasting state and also after a meal. In the fasting state, the mean peak serum concentration was 5.5 µg. per ml. at 2 hours, and the postprandial peak was 6.6 µg. per ml. usually at 4 hours. The absorption, as indicated by the area under the serum curves, and the urine excretion were slightly, but significantly, less in the postprandial state. However, the ingestion of Rifampicin fasting or

in the postprandial state made virtually no difference to the time for which the serum-Rifampicin remained above the minimum inhibitory concentration for *Mycobacterium tuberculosis* (0.2 µg. — 0.5 µg per ml.). From this it would be inferred that the chemotherapeutic effect is likely to be very similar. It is, therefore, unnecessary to insist that Rifampicin in a single dose of 600 mg. is taken fasting.

S.P.P.

Rifampicin concentrations in cerebrospinal fluid of patients with tuberculous meningitis

John E. Sippel et al. Amer. Rev. Resp. Dis.; 1974 109, 579.

Rifampicin was administered orally in one dose of 25 mg/kg (maximum 600 mg) to 6 patients with tuberculous meningitis who had received no previous anti-tuberculous chemotherapy and to 7 controls. One case of meningitis was 3 years old and the others were between 20 and 35 years. In 4 of them the diagnosis was bacteriologically confirmed. There was no significant difference in Rifampicin absorption at 3 hours between patients and controls. However, no Rifampicin could be detected in the 3-hour CSF specimens taken from controls. Significant concentrations were reached in patients' CSF within 3 hours and were maintained for 24 hours. It proves that Rifampicin does not easily diffuse through normal meninges but can penetrate the diseased meninges in therapeutically high concentrations.

S.P.P.

Primary Drug Resistance. A continuing study of Drug Resistance in Tuberculosis in a Veteran Population within the United States

Gladys L. Hobby et al. Amer. Rev. Resp. DM.; 1974, 110, 95.

Sensitivity results of 0 strains of mycobacterium tuberculosis from newly diagnosed, previously untreated cases of pulmonary tuberculosis in a Veteran's population in USA in a continuing survey during the period 1970 to 1973 are reported. The study indicates that during these 3 years there was no consistent and clear-cut trend towards greater frequency of primary drug resistance to any of the anti-tuberculous drugs. Primary resistance to Ethambutol and Rifampicin was about 2% each; to streptomycin, INH & PAS about 4% each.

S.P.P.

Isoniazid prophylaxis among Alaskan Eskimos: A Progress Report

George W. Comstock. Amer. Rev. Resp. Dis.; 1974, 110, 195.

Two chemoprophylaxis programmes were conducted in Alaska. A placebo-controlled trial was started in 1957 and a community-wide programme in 1964. In both programmes INH was given in a single daily dose of 4 to 8 mg per kg. body weight for one year. Tuberculosis case rates in the period 1964 to 1973 indicate that the effectiveness of INH prophylaxis persisted upto the 15th year after its administration. The results raised the possibility that six months' administration of INH (instead of the usually recommended one year) may be sufficient for prophylaxis.

S.P.P.

The influence of immigration on tuberculosis in Ontario

Mary Jane Ashley, Terence W. Anderson & W. Harding Le Riche. Amer. Rev. Resp. DM-; 1974, 110, 137.

Between 1961 and 1971 cases in the Canadian-born population of Ontario declined more than those in the foreign-born population. By 1971, these two segments which constituted 77% and 22% respectively of the total population, were contributing equal number of cases. During this period, the immigration from high incidence areas had increased with a relative decrease in those from low incidence areas. One in 5 of all new active patients had lived in Canada for less than 5 years. 90% of immigrants and 84% of recent immigrant cases were less than 45 years of age. The morbidity experience of immigrants closely resembled that of the country of their origin. There was an increase in the foreign-born in the "recent" forms of disease and a preponderance of lymphadenitis in the Asian-born.

S.P.P.

Massive Intrapulmonary Hemorrhage: An uncommon complication of Bullous Emphysema.

Stephen J. Jay & Waldemar G. Johanson. Amer. Rev. Resp. Dis.; 1974, 110, 497.

Air-fluid levels in emphysematous bullae are common and are thought to result usually from infection. These could be due to intrapulmonary hemorrhage also. Intrapulmonary

hemorrhage, even if massive, may not be suspected in the absence of haemoptysis. A case is reported of a 65 year old man reporting with a fluid level in a big emphysematous bulla in a lung with extensive fibro-caseous disease. There was no history of haemoptysis and the patient attended because of sudden and severe dyspnea. Drainage through thoracostomy tube proved fluid in the bulla to be pure blood. Bronchography later on proved occlusion of the bronchus due to angulation which explained the absence of haemoptysis.

S.P.P.

Sarcoidosis with pleural involvement

Don G. Nelson and Robert G. London. Amer. Rev. Resp. Ph.; 1973, 10&, 647.

Sarcoidosis involving serous membranes of the body is rare. A case of Sarcoidosis involving the pleura is reported. This is the fifth reported case of biopsy-proved sarcoidosis involving pleura. A Negro woman, 32 years old, was diagnosed as a case of sarcoidosis involving both lungs and proved by cervical node biopsy. She was treated with corticosteroids. Sixteen years after the diagnosis of pulmonary sarcoidosis, she developed pleural effusion. Needle biopsy of pleura demonstrated presence of sarcoidosis of the pleura.

S.P.P.

Measurement of respiratory gases and pH of pleural fluid.

Akira Funahashi, Tapan K. Sarkar & Ross C. Kory. Amer. Rev. Resp. Dig.; 1973; 108, 1266.

The tension of respiratory gases and pH of the pleural fluid in 61 patients at Wood Veterans Administration Hospital were evaluated for their possible use in differential diagnosis. The oxygen and carbon dioxide tension were too variable to be of any use; however pH might be of diagnostic use since pH values less than 7.29 in non-hemorrhagic pleural fluid were usually associated with non-malignant inflammatory effusions and higher pH values were seen in effusions secondary to either congestive heart failure, cirrhosis or malignancy. Four patients where pleural effusion was associated with pneumonia were an exception since they showed a pH value more than 6.29. All but one of the four patients with tuberculous effusions showed pH values lower than 7.29.

S.P.P.

Diagnostic significance of pleural fluid pH and PCO

Richard W. Light et al. Chest; 1973, 64, 591.

The pH values of 178 pleural effusions were estimated to find out if this could be used as a diagnostic criterion of aetiology of effusions. The pH values were found to vary widely, the range being 6.89 to 7.60. The effusions associated with pneumonia (acute febrile illness with purulent sputum and pulmonary parenchymal lesions with pleural effusions) showed most widely varying values. Treatment with antibiotics etc. was inadequate to affect resolution of any of the five effusions with pneumonia with a pH of less than 7.20 even though none of these five effusions was grossly purulent. On the other hand, all the 19 effusions with pneumonia but with a pH greater than 7.20 resolved with antibiotic treatment *without* tube drainage. The mean pH value for tuberculous effusions was significantly lower than the mean value for malignant effusions. When differentiation lies between malignancy and tuberculosis, a pH value below 7.30 is highly suggestive of tuberculosis, while a pH greater than 7.40 is highly suggestive of malignancy. The pH values in case of pleural transudate as in congestive heart failure was usually more than 7.40.

S.P.P.

A controlled clinical trial of small daily doses of Rifampicin in the prevention of adverse reaction to the drug in a once weekly regimen of chemotherapy in Hong Kong. Second Report — The results at 12 months.

A Hong Kong Tuberculosis Treatment Service/ British Medical Research Council Investigation. Tubercle (1974), 53, 193.

119 Chinese patients first line drug failure and with positive sputum were retreated with a regimen of once weekly rifampicin, ethambutol and pyrazinamide. All patients received daily supplementary capsule of rifampicin 75 mgm or a placebo in a double blind investigation to determine whether small daily supplement of rifampicin would prevent adverse reactions to once weekly rifampicin.

At 12 months, the incidence of clinically important adverse reaction to once weekly rifampicin was significantly lower for patients receiving daily rifampicin supplement being 34 percent of 58 patients compared with 55 percent of 58 patients on daily placebo (P=0.04). Circulating rifampicin dependant antibodies were detected in the serum of 31 percent of 51

patients on the rifampicin supplement compared with 44 percent of 50 patients on placebo ($P=0.3$). The association between the incidence of adverse reactions and the presence of antibodies was highly significant ($P=0.002$). Eighty three percent of 42 patients on the rifampicin supplement had a bacteriologically favourable status at 1 year compared with 85 percent of 33 patients on placebo, showing that the daily supplement of rifampicin did not have a therapeutic effect.

The addition of pyrazinamide for the first 3 months to once weekly rifampicin plus ethambutol did not produce better therapeutic response than was obtained from similar patients treated with once weekly rifampicin plus ethambutol alone in a previous Hong Kong study.

H.B.D.

A study in Hong Kong to evaluate the role of pretreatment susceptibility tests in the selection of regimens of chemotherapy for pulmonary tuberculosis — Second Report.

A Hong Kong Tuberculous Treatment Services! British Medical Research Council Investigation. Tub. (1974) 55,169.

In an analysis of 527 patients, who remained upto 3 years in the three policy studies were 174 patients, who were given:

Policy A :- Streptomycin, isoniazid and PAS ignoring the pretreatment sensitivity test.

Policy B:- 182 patients in whom the above standard chemotherapy, but introducing other drugs if the pretreatment strain was resistant in a standard indirect sensitivity test.

Policy C :- 171 patients who had a slide culture sensitivity test performed before the start of treatment and appropriate regimens were selected in the light of the result.

32 percent, 25 percent and 33 percent respectively having drug resistant strains on standard indirect sensitivity testing on admission. The proportions resistant to 2 or all 3 drugs being 14 percent, 10 percent and 13 percent.

The proportion of patients with a favourable response throughout the 3 years were 88 percent Policy A, 87 percent for Policy B and 90 percent for Policy C. The findings for the patients with sensitive strains on admission being 97 percent, 95 percent and 91 percent respectively and for patients with resistant strains on admission 69 percent, 87 percent and 88 percent respectively.

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For patients with changes of chemotherapy, who failed on their first regimen, the final success rates at 3 years were 95 percent on Policy A, 95 percent on Policy B and 96 percent on Policy C, the results for patients with sensitive strains on admission being 97 percent, 95 percent and 96 percent respectively and those with resistant strains 91 percent, 93 percent and 96 percent respectively. On Policy A, 24 of 31 patients with resistance to 1 drug had a favourable response throughout the 3 years, as did 12 of 17 with resistance to 2 drugs and 2 of 7 with resistance to all 3 drugs. After change of therapy the number with a favourable response increased to 29, 15 and 6 respectively.

The failure rate in patients with fully sensitive organisms who were treated with standard chemotherapy was 8.4 percent due to a failure to self administer drugs in the continuation phase of chemotherapy. An estimated failure rate of 5.2 percent resulted from the high (30 percent) prevalence of pretreatment drug resistance in the patients on Policy A.

More reserve drugs were prescribed and there was more drug toxicity in the patients on Policy B and C which are less simple to implement than Policy A.

H.B.D.

A pilot study of two regimens of intermittent Thiacetazone plus Isoniazid in the treatment of Pulmonary Tuberculosis in East Africa

Tubercle (1974), 55, 211

A comparison made at 12 months in East African patients with acute pulmonary tuberculosis of the following 2 regimens showed.

4 *STH* :- Streptomycin sulphate 1 gm with thiacetazone 150 mgm plus isoniazid 300 mgm daily for 4 weeks, followed by 450 mgm plus isoniazid 15 mgm/Kg twice weekly for 48 weeks.

8 *STH* :- The above regimen but with daily intensive phase for 8 weeks, followed by twice weekly for 44 weeks.

At 12 months 20 (80%) of 25 4 *STH* compared with 22 (92%) of 24 8*STH* patient showed favourable response.

There was hardly any toxicity.

H.B.D.

Controlled clinical trial of four short course (6 months) regimens of chemotherapy for treatment of pulmonary Tuberculosis.

Lancet Nov. 9, Vol. II 1974

Second East African British Medical Research Council Study. A comparison has been made of 4, 6 month regimens in the treatment of newly diagnosed cases of advanced pulmonary tuberculosis. The regimens were

SHR

Streptomycin plus isoniazid plus rifampicin daily for 6 months.

HR

As above for 6 months but omitting streptomycin.

SHRZ/TH

An initial intensive phase of streptomycin, isoniazid, rifampicin plus pyrazinamide daily for 2 months, followed by thiacetazone, isoniazid daily for 4 months.

SHRZ/S₂H₂Z₈

The initial 4 drug intensive phase as above for 2 months followed by streptomycin, isoniazid plus pyrazinamide twice weekly for 4 months.

The object of this study were firstly to assess

the extent of streptomycin contribution to the success of SHR regimen.

Secondly to assess the efficacy of 6 months regimens based on a 4 drug intensive phase using either daily TH or twice weekly SHZ during continuation phase.

At 6 months, only 3 of 734 patients were classified as having an unfavourable response. There was very little drug toxicity.

The bacteriological relapse rate between 6 and 12 months were 5% of 170 patients on the two drug combination, 2% of 166 patients on the three drug combination, 6% of 180 patients on the regimens with thiacetazone plus isoniazid in the continuation phase and 4% of 161 patients on the regimens with intermittency in the continuation phase.

Most of the relapses occurred by 9 months and all except 1 of 31 patients who relapsed did so with sensitive organisms.

It is concluded that all the regimens were effective, that the streptomycin in the triple regimen has not made any important contribution to therapeutic success and that reducing the rifampicin to 2 months has left effective regimens even when followed in the continuation phase by a standard daily regimens or a twice weekly intermittent regimen.

H.B.D.