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conditions, the very high serum beta lipoprotein apparently being produced by the abnormal plasma cells in the bone marrow.

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Tuberculosis: Hospitalization and Outpatient Treatment

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ABSTRACT

Initial hospitalization terminated by discharge upon medical advice to continue with chemotherapy on an outpatient basis represents the treatment of choice for most patients with active pulmonary tuberculosis. Any departure from this plan for any patient should be accepted only after careful consideration of all the circumstances. Patients with active pulmonary tuberculosis who are to receive outpatient chemotherapy without adequate initial hospitalization should be carefully selected by the local or provincial department of public health. Approval in writing should be required from the appropriate public health authority before antituberculosis chemotherapy is provided at public expense for any such patient, except possibly for a limited period while awaiting formal approval. In all instances, the clinic which dispenses the antituberculosis drugs should have the patient under supervision with recall for follow-up examinations as required. *Prophylactic* antituberculosis chemotherapy may be provided to certain groups of persons without hospitalization.

SOMMAIRE

Nous estimons que, pour la plupart des malades atteints de tuberculose pulmonaire active, le traitement par excellence consiste à les hospitaliser au début, puis, leur congé obtenu sur l'avis conforme des médecins traitants, de continuer à les traiter comme malades externes par des agents chimiothérapiques. Toute dérogation à ce plan, pour n'importe quel malade, ne devra être acceptée qu'après avoir mûrement pesé toutes les circonstances du cas. C'est ainsi que le Service d'Hygiène local ou le Ministère provincial de la Santé devra choisir avec soin les tuberculeux qui seraient traités en externe par la chimiothérapie sans avoir été hospitalisés au préalable. L'acceptation écrite des autorités compétentes devra être obtenue avant d'instaurer chez ces malades un traitement chimiothérapique au frais du Gouvernement, sauf peut-être pendant une période limitée, en attendant l'approbation officielle. En tout cas, la clinique qui distribue les médicaments antituberculeux devra avoir le malade sous sa surveillance stricte et exiger des examens périodiques subséquents. Les médicaments antituberculeux peuvent être donnés à *titre prophylactique* à certains types de malades sans qu'il soit nécessaire de les hospitaliser.

IT IS perhaps timely to consider the relationship of hospitalization to outpatient chemotherapy in the management of patients with active tuberculosis and particularly with active pulmonary tuberculosis. The terms "home treatment for tuberculosis" and "ambulatory care of tuberculosis" are ambiguous. If such terms are used, it should be explained whether the continuation of chemotherapy at home following a period of hospitalization is meant, or treatment without initial hospitalization.

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HOSPITALIZATION

Treatment without initial hospitalization might be suitable in the case of a financially independent, co-operative and asymptomatic patient with active minimal pulmonary tuberculosis under the careful supervision of a physician with experience in thoracic disease. Assuming that such cases are reported to the medical officer of health, it should be possible for the latter to confirm that the contacts have been examined and to determine if isolation and treatment of the patient are being conducted as required. Nevertheless, for most persons with established or suspected tuberculosis of the lung, an initial period of hospitalization is advisable and should be recommended if hospital beds are available for that purpose. Not every radiographic abnormality of the chest is due to tuberculosis. A period of hospitalization offers not only the opportunity for confirmation of diagnosis, but if active tuberculosis is present, antituberculosis treatment may be commenced under supervision while watching for the appearance of drug intolerance. The patient and his family can learn about the disease and the need for continuous and uninterrupted treatment. Appropriate measures can be taken when necessary to help in the rehabilitation of the patient. The source of infection is removed from the community. The progress of sputum conversion and cavity closure can be followed by radiographic and laboratory examinations.

The duration of hospitalization required for any patient is a matter for the judgment of the hospital staff physician who should make himself familiar with the personality and character of his patient, as well as the family situation and the environment into which the patient might be discharged. Patients who can be depended upon for co-operation as outpatients are being discharged from hospital within several months following admission, if it can be determined that such a discharge is in the best interest of the patient and the community.

It should be recognized, however, that a certain number of patients admitted to tuberculosis hospitals are too elderly or senile for early discharge on outpatient chemotherapy. Other patients would return on discharge to hostels or rooming houses on welfare allowance or some type of pension. Certain other patients are chronic alcoholics who could not be trusted to take their drugs without interruption as outpatients. For such patients, hospitalization beyond the period of infectivity may be advised. The reported "average duration of stay" in tuberculosis hospitals is misleading, and is definitely longer than the duration of stay for co-operative patients who will follow medical advice as outpatients.

Of the 736 patients admitted from Ontario to the Tuberculosis Unit at the Toronto Hospital, Weston, in 1963, 67% were males; 48% of males and 27% of females were aged 50 years or more; 35% of males and 12% of females were classified on admission as "unemployed, on welfare, retired or receiving old age or disability pension". It is also of interest that 25% of patients with respiratory tuberculosis had far-advanced disease; 70% of first admissions yielded tubercle bacilli by some method immediately before or after admission; 10% of first admissions were found not to have tuberculosis after investigation.

A number of studies[1] have suggested that rest plays a minor role in the treatment of patients with pulmonary tuberculosis provided an effective chemotherapeutic regimen is employed. Such a regimen requires that the patient receive at least two of the antituberculosis drugs to which any tubercle bacilli recovered have been shown to be sensitive. The Committee on Therapy of the American Thoracic Society has suggested that patients with no symptoms who are bacteriologically negative and for whom surgery is not contemplated may be discharged from hospital to continue chemotherapy and be followed as outpatients. Such patients may return promptly to their normal work and recreation within the limits of their general physical condition. Certain patients may therefore be suitable to return to work on chemotherapy almost immediately after discharge from hospital. The Committee on Therapy (noted above) calls attention to the fact that longer hospitalization may be necessary if the patient is considered unreliable, is faced with unfavourable social and economic conditions, or would lack adequate outpatient facilities for follow-up care.

In Canada there are some, but as yet relatively few, patients with tubercle bacilli that show significant resistance to a combination of two of the three principal antituberculosis drugs. For such patients, an effective antituberculosis chemotherapeutic regimen may not be achieved or may be difficult to achieve and therefore the value of rest in controlling or healing the tuberculous process should be kept in mind. A regimen of restricted activity should be prescribed for all patients who harbour organisms which are not susceptible to at least two of the three principal antituberculosis drugs.

The Committee on Therapy of the American Thoracic Society believes that the initial hospitalization of tuberculous patients is advisable even when rest in bed is not indicated. Admission to hospital for the initial phase of treatment is important for the following reasons:

1. Quarantine of the patient is provided while he is still bacteriologically positive or while the bacteriologic status is being established.

2. Superior diagnostic facilities are available for establishing the complete diagnosis.

3. Chemotherapy may be initiated while the patient is under careful observation for possible toxic manifestations.

4. The necessity for surgery may be adequately assessed.

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5. Education and proper instruction of the patient and his family concerning tuberculosis may be accomplished.

6. The adequacy of social and economic conditions for continued chemotherapy after discharge can be assessed.

Provided an effective antituberculosis chemotherapeutic regimen has been achieved, only rarely is it necessary to recommend a change in the patient's occupation because he has had active tuberculosis, unless he is returning to exposure to silica dust, or unless returning to the previous occupation would be contraindicated because of the patient's reduced pulmonary reserve or for other medical reasons. In the latter instances, vocational rehabilitation should be initiated as soon as practical after admission to hospital.

Outpatient Treatment Following Adequate Hospitalization

A tuberculosis hospital should have an outpatient clinic which will care for and supervise the treatment of ex-patients. The number of outpatient examinations necessary has increased within the past 15 years and will continue to increase for some years to come. In other words, tuberculosis patients are now being kept alive and discharged from hospital to require examinations as outpatients for the rest of their lives. As yet, any slight decrease in the number of new cases appearing each year has not compensated for the cumulative increase in the number of persons with inactive tuberculosis who must be followed by regular re-examinations for the remainder of their lives.

A tuberculous in-patient now becomes an outpatient in most instances after spending only several months in hospital, but chemotherapy is usually required for a total period of approximately 24 months. For most persons with tuberculosis, treatment out of hospital is therefore many times longer than treatment in hospital. It is important that antituberculosis chemotherapy be accepted without interruption and for an adequate length of time. Supervision and frequent contact with an understanding physician or nurse is essential for the successful outpatient treatment of most persons with tuberculosis. Except when not convenient because of distance, the hospital outpatient clinic affords a natural follow-up clinic for the patient after he is discharged. The records are available. Immediately after admission to the hospital and before chemotherapy was commenced, sputum is placed on culture for tubercle bacilli. Organisms if grown are tested for sensitivity to the antituberculosis drugs. The outpatient is seen at each visit usually by the staff physician who cared for him as an in-patient

When outpatient treatment is to be undertaken by a clinic not associated with the hospital where treatment was initiated, it is important that a detailed discharge summary be forwarded promptly by the hospital to the selected clinic. Copies of the summary should be sent to the appropriate medical officer of health, the family physician and the provincial department of health. The discharge summary should include not only the medical evidence to support the diagnosis but also a full account of any intolerance to the antituberculosis drugs experienced by the patient, the dosage of the drugs prescribed and the amount of the drugs issued at the time of discharge, as well as the instructions given as to the date and place for the first examination as an outpatient.

The present total duration of chemotherapy is approximately equal to the average duration of stay in hospital for tuberculous patients in 1950. Even including any compensation which may be provided to chest clinics for the supervision of outpatients receiving antituberculosis chemotherapy, the present overall expenditure for tuberculosis treatment by the provinces is much less than it would be if long-term hospitalization continued to be necessary at present *per diem* costs. Relatively inexpensive outpatient chemotherapy has replaced many months of hospitalization. In the interest of public health, it might be hoped that a substantial portion of the funds not spent on tuberculosis hospitalization will be used to provide the additional public health nursing and other services necessary to maintain a high standard of outpatient treatment and supervision. Inadequate outpatient care should be tolerated no more than substandard in-patient care.

Outpatient Treatment Without Adequate Hospitalization

Problems will arise concerning the outpatient antituberculosis chemotherapy of persons who are absent from hospital without medical approval, or of persons with active pulmonary tuberculosis who for various reasons are not admitted initially to any hospital. The medical officer of health for the district in which any such person resides will wish to investigate the circumstances. It should be remembered that among such persons there will be a certain number who are uncooperative and therefore unlikely to follow closely *any* type of medical supervision and treatment. (It is accepted that, in some of these cases, evidence will be lacking to support a magistrate's warrant for commitment to a tuberculosis hospital.) To ensure adequate control, I would like to propose certain measures based upon knowledge and experience with the problem as it confronts the patient, the tuberculosis hospital, the clinic, the public health department and the private physician. The procedures suggested in this presentation are considered obligatory for active respiratory tuberculosis, and are probably advisable even for extrapulmonary forms of the disease. In the latter types of tuberculosis there is usually less danger of infecting others and the source of infection is not as likely to be found among recent contacts.

Proposal: After consulting with the family physician (if any), the medical officer of health should decide from a knowledge of all pertinent factors whether or not outpatient antituberculosis chemotherapy should be provided at public expense to the individual with active tuberculosis who has not been medically discharged following initial hospitalization. If the medical officer of health considers that outpatient antituberculosis chemotherapy for the person concerned can be justified under the circumstances, a recommendation to that effect should be forwarded to the provincial department of health for approval. This approval if granted should then be directed in writing to the clinic which is to undertake the outpatient treatment, with copies for the information of the private physician and the medical officer of health who made the recommendation. These measures or their equivalent are deemed advisable to ensure the notification of new cases, the investigation of home conditions and the examination of contacts, as well as to provide some notation upon such cases in the tuberculosis case-register. Before accepting responsibility for the prolonged outpatient drug treatment and supervision of a person with active tuberculosis under the circumstances being considered, the clinic should receive written approval from the provincial department of health, unless previously instructed by the latter to accept written approval in each case directly from the appropriate medical officer of health. It is believed that by requiring written approval from the local or provincial department of health in such cases, a careful review is likely to be made of the circumstances including the home conditions of the patient. By this procedure also, the responsibility for the outpatient antituberculosis chemotherapy of a person under such circumstances will be shared by the clinic and the local or provincial department of health. (Where a delay in obtaining the written approval might cause a significant interruption of chemotherapy, the clinic could provide the necessary drugs for a limited period while awaiting formal approval.) Furthermore, for any patient for whom the required information is not already on record at the clinic, a full report should be provided to the outpatient clinic including the evidence supporting the diagnosis, as well as an outline of any treatment received and any progress to that date.

Nothing that has been proposed will prevent chest clinics from offering *prophylactic* antituberculosis chemotherapy for the accepted period of time on an outpatient basis without hospitalization to:

(a) Tuberculin reactors under five years of age where the chest radiograph is within normal limits.

(b) Tuberculin reactors over five years of age where the chest radiograph is within normal limits and where there has been close contact with open tuberculosis and where unequivocal tuberculin conversion is known to have occurred within the previous 12 months.

(c) Persons with apparently inactive tuberculosis who have not already had the benefit of adequate chemotherapy, or who for certain reasons might benefit from further chemotherapy.[2]

(d) Persons receiving prolonged corticosteroid therapy in the presence of a positive tuberculin reaction.

DISCUSSION

All cases of active tuberculosis should be reported promptly to the appropriate medical officer of health, who should ensure that the contacts are examined for tuberculosis and that the patient receives the type of management required to prevent the spread of this disease. The advantages of initial hospitalization in the management of patients with established or suspected active tuberculosis include: (1) a period of quarantine while bacteriologically positive, (2) superior diagnostic facilities for investigation, (3) observation while antituberculosis chemotherapy is being initiated, (4) health education of the patient and family, (5) assessment of social and other factors, etc. When an effective antituberculosis chemotherapeutic regimen is established and the patient is no longer infective, an early discharge from hospital to outpatient chemotherapy is usually arranged. In most instances, only several months may be spent in hospital. Following discharge, the patient may resume work almost immediately on outpatient antituberculosis chemotherapy. It is presently accepted that the total period of drug treatment for most patients with active tuberculosis is approximately two years. Except where distances render it otherwise not acceptable, the outpatient clinic of the hospital where treatment was initiated usually offers the most suitable facility for outpatient chemotherapy and supervision. The outpatient clinic should keep the family physician informed by a report upon each visit of the patient to the clinic.

There are problems to consider in the control of outpatient antituberculosis chemotherapy of persons who leave hospital against medical advice before a diagnosis can be established, or while continuing to spread tubercle bacilli, or who do not receive any initial hospitalization. Such persons who are to receive long-term outpatient chemotherapy for tuberculosis at public expense under those circumstances should be carefully selected. The medical officer of health and the staff of the health unit are qualified and have access to the necessary information to make that selection.

Outpatient treatment at public expense of patients with active pulmonary tuberculosis without adequate initial hospitalization, without confirmation that tubercle bacilli are absent from the sputum and without proper consideration of all pertinent factors including the home conditions of the patient, is a policy which should be resisted in

this country where beds are available in tuberculosis hospitals and where adherence to public health principles has helped to bring us far along the road toward the control of this disease. To ensure that the circumstances in each case have been carefully considered, it is proposed that written approval be received by the clinic from the local or provincial department of health before outpatient antituberculosis chemotherapy is commenced for any patient who has not been discharged from initial hospitalization upon medical advice. In the event that a patient leaves the hospital against medical advice while on chemotherapy, the outpatient clinic could provide the necessary drugs for a limited period to prevent interruption of chemotherapy while awaiting the written decision of the local or provincial department of health.

The indiscriminate use of chemotherapy for patients with established or suspected active pulmonary tuberculosis without initial investigation, observation or isolation is contrary to the principles of preventive medicine. Such a compromise with the desired standard is accepted for humanitarian and compassionate reasons in certain developing countries where the number of hospital beds remains grossly inadequate. Public health authorities have some misgiving concerning this type of program even in such countries. The patient with open tuberculosis continuing in the home and in the community is a source of infection at least during the early period of drug treatment. Medication taken irregularly will not only prolong the period of infectiousness but will cause the appearance of drug-resistant tubercle bacilli. Other persons who are infected with these bacilli and who develop tuberculous disease will respond to a limited extent when treated with the drug or drugs to which a degree of resistance has developed. We have no assurance that additional effective drugs will become available in the future. The determination of bacillary sensitivity to the drugs presently in use requires that we first obtain living tubercle bacilli from the patient. By the cultural methods commonly employed, the appearance of colonies of tubercle bacilli may be delayed up to eight weeks. Many patients, unless they are in some distress, will prefer to avoid even that period of hospitalization which is required to establish whether or not tubercle bacilli are present in sputum or gastric washings. If the private physician fails to convince the patient that he or she should accept initial hospitalization, the local or the provincial department of health should investigate the circumstances and accept responsibility for arbitration. Any significant departure or relaxation from the principles of preventive medicine could establish by precedent and example a policy from which it might be difficult to withdraw. How carefully we limit and regulate any trend to provide chemotherapy to patients with active pulmonary tuberculosis without adequate initial hospitalization may influence the control of tuberculosis in this country within the next decade.

SUMMARY

The advantages of initial hospitalization for patients with suspected or established active pulmonary tuberculosis have been outlined. When an effective antituberculosis chemotherapeutic regimen has been achieved and when a co-operative patient is no longer infective, he is discharged from hospital to receive continued chemotherapy on an outpatient basis. Only the initial few months of the total two years or more of chemotherapy are usually received in hospital.

When initial hospitalization is refused, or the patient leaves the hospital against medical advice, the medical officer of health must decide if outpatient antituberculosis chemotherapy under the circumstances for that particular patient will adequately protect other people in the home and the community from the spread of this disease. If outpatient chemotherapy without adequate initial hospitalization is considered suitable for a certain patient, written approval of such an arrangement for that patient should be provided by the local or provincial department of health to the clinic which is selected to supervise the outpatient treatment.

In addition to the supervision of antituberculosis chemotherapy for patients regularly discharged from hospital, and certain carefully selected patients not so discharged, outpatient clinics may offer *prophylactic* chemotherapy to certain groups of persons under circumstances which have been outlined.

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PAGES OUT OF THE PAST: FROM THE JOURNAL OF FIFTY YEARS AGO

THE MESSAGE OF THE CUP-BEARER

Sewage from the Lachine Canal is to be distributed again as drinking water to the citizens of Montreal. The physicians, individually and in their corporate capacity, have protested, but the warning has fallen on deaf ears. And the people of the metropolis of Canada how is it with them? Is it long-suffering or indifference, or worse? Typhoid, forsooth, is only the modern Mumbo-Jumbo conjured up in various forms by the medicine man in all ages, while compared with dilute, highly chlorinated sewage your filtered water would be insipid!

The age of miracles is past. Who, then, shall deliver *us* out of the hands of the Assyrian? In the days of Hezekiah, King of Judah, Sennacherib sent unto him his messenger. The Mayor and Board of Control bring again to the people of Montreal that message which Rab-shakeh—the name, being interpreted, aptly signifies Chief Cup-bearer—delivered to Eliakim, Shebnah, and Joah, and to the men of Jerusalem who sat upon the wall. The message contained this threat, which, for an unbiblical generation, must be veiled in the decent obscurity of a dead language: *Ut comedant stercora sua et bibant urinam suam.*—Editorial, *Canad. Med. Ass. J.*, 4: 625, 1914.