Management of Tuberculous Patients in a General Hospital

GEORGE KATZ, M.D., F.C.C.P.
Great Neck, New York

In our community hospital,* which opened in July, 1953, the local department of health and the county tuberculosis sanatorium informed us that admission of tuberculous patients would not be a problem, since the county tuberculosis hospitals and clinics could care for the small number of patients. However, from 1953 to the end of 1959, we admitted 111 patients, characterized as follows:

1. Active tuberculosis requiring emergency admission due to severe complication: hemoptysis, spontaneous pneumothorax, meningitis, miliary tuberculosis and acute and exudative pleurisy, and active complicated pulmonary tuberculosis requiring admission because of diabetes, pregnancy, acute infection, acute surgical condition, etc.

2. Active pulmonary tuberculosis requiring hospitalization, but the patient refusing treatment in sanatorium or tuberculosis hospital.

3. Patients with extrapulmonary tuberculosis, such as skin, bone, kidney, gynecologic conditions and atypical acid-fast diseases.


5. Admissions for nontuberculous disease, but in whom active or inactive tuberculosis was discovered in the hospital.

In the classification of our admissions of inactive pulmonary tuberculosis, only patients with moderately advanced or far advanced disease are discussed. These patients were admitted for nonspecific lung conditions. Evidence of minimal lesion with clinical and x-ray film evidence of arrested tuberculosis are excluded from our statistics of tuberculosis admissions.

Corresponding to our classification, we admitted from 1953 to 1959 the following groups of tuberculous patients:

1. Thirty with active pulmonary tuberculosis and with the demonstration of acid-fast bacilli in sputum, gastric contents, tissue material by staining, culture, or animal inoculation. In this group, nine had cavities.

2. Sixteen with active pulmonary tuberculosis, proved by x-ray film, clinical symptoms, etc., but with negative sputum. Three of these were children with the characteristic tuberculin conversion type, and one was a child with active early pulmonary tuberculosis.

3. Eleven with other forms of acid-fast disease: three cases of cervical adenitis proved by biopsy material, four of bone, one of kidney, one of gynecologic involvement, one of skin tuberculosis and one of atypical acid-fast bacilli.

4. Twenty-five cases with anatomically moderate or far advanced tuberculosis demonstrated by x-ray film, clinically inactive or arrested, but with history of past activity of their disease.

5. Twenty-nine cases with x-ray film findings suggesting anatomically moderate or far advanced arrested tuberculosis without history of past activity.

Of the 111 patients, six were diabetics (one with active and five with inactive tuberculosis).

Seven were obstetric patients (two with active and five with inactive tuberculosis).

Half of our patients were admitted for nontuberculous diseases, especially arrested cases and the admission was brought about chiefly by end-results of the pulmonary tuberculosis, such as late cardiopulmonary involvement, pulmonary fibrosis, bronchiectasis, emphysema and asthma. There were other co-existing conditions such as

*From the Division of Medicine, North Shore Hospital, Manhasset, New York.
poisoning, alcoholism and forms of cancer, in which pulmonary tuberculosis was found.

The average age of our tuberculous patients was:

<table>
<thead>
<tr>
<th></th>
<th>Under 45</th>
<th>Over 45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary tuberculosis with positive sputum</td>
<td>70</td>
<td>30</td>
</tr>
<tr>
<td>Other forms of active tuberculosis</td>
<td>85</td>
<td>15</td>
</tr>
<tr>
<td>Active lung tuberculosis with negative sputum</td>
<td>75</td>
<td>25</td>
</tr>
<tr>
<td>Arrested tuberculosis</td>
<td>48</td>
<td>52</td>
</tr>
</tbody>
</table>

Of 111 patients, 55 were men and 56 were women; 82 were white and 29 Negro. Eight children had the following:

<table>
<thead>
<tr>
<th></th>
<th>White</th>
<th>Negro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary tuberculosis</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Conversion tuberculin type</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Lymph node</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Bone tuberculosis</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total:</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

Among our admissions there is a relatively small representation of adult Negro tuberculous people compared with the relatively large Negro population in the surrounding villages which contribute patients to our hospital. This may be due to the poor distribution of medical care and the scarcity of service beds for this economic group. From our relatively small number of hospitalized children, the percentage of Negro admissions is higher than that of white children.

Only three of the 111 tuberculous patients during the period 1953-1959 died in the hospital, and none of them of tuberculosis. One, with progressive active pulmonary tuberculosis, committed suicide; two, with arrested tuberculosis, died of lung cancer.

Two of our employees had active tuberculosis: a former chief nurse and a woman physician. Neither was a contact infection in the hospital.

**Diagnosis**

*X-ray film examination* of the chest was carried out as the first step in the detection of tuberculosis. This routine admission procedure serves to protect employees from contact with an active, undiagnosed case. Furthermore, isolation procedures can be started immediately, when active tuberculosis is proved or suggested by x-ray film examination. Routine admission chest x-ray films not only protect the hospital and physician from malpractice action for failure of necessary x-ray work-up, but also help in the detection of nontuberculous lung conditions, such as fungus disease, tumors, sarcoidosis, pneumoconiosis, collagen disease, etc. Tomographic chest x-ray examination is also available as an aid in differential diagnostic problems.

Positive tuberculin reaction is of value for case finding, group supervision, and in the discovery of the early tuberculin conversions. We use only PPD for tuberculin tests. We start with a concentrated Pirquet test with concentrated PPD. If this scratch test is positive, we perform a Mantoux test: 1:1,000,000 PPD (5 tuberculin units) and 1:5,000,000 PPD (1 tuberculin unit). Only a positive test to the concentration of 1:5,000,000 PPD excludes practically any unspecific reaction to the tuberculin protein, or a cross reaction to atypical acid-fast infection. Still, a negative reaction to all our tuberculin tests does not exclude inactive or active tuberculosis.

Sputum examination by staining, culture or animal inoculation is made and typing methods are used to differentiate the human tubercle bacillus from the bovine, avian and the atypical acid-fast organisms. The erythrocyte sedimentation rate is only of value if repeated a number of times. Bronchoscopy, bronchography, and bronchobiopsy were also used for diagnosis as well as for therapy. Pulmonary biopsy has helped to exclude active tuberculosis in eight cases.

The utilization of the facilities of a general hospital from a diagnostic point of view has many benefits. The completeness
of the medical and surgical facilities available to the patients makes the studies most reliable. These include the services of a phthisiologist, internist, surgeon, bacteriologist and pathologist. Nontuberculous pulmonary diseases, such as fungus infection, sarcoidosis, etc., often encountered in sanatoria, are diagnosed in a general hospital in a relatively short time; they are treated there, and sent home. It is likely that patients, especially those with sarcoidosis, who previously had remained, through error, in a sanatorium became tuberculin positive because of contact infection.

A general hospital, from a diagnostic point of view, becomes, therefore, a screening hospital for patients with chronic tuberculosis who require sanatorium treatment, for those with active tuberculosis who can be temporarily treated in a general hospital, and especially for a considerable percentage of patients in whom nontuberculous pulmonary disease is diagnosed and, who therefore do not require sanatorium care.

**Prevention and Control of Tuberculous Infection in Our Hospital**

We follow recommendations of the New York State Department of Health publications regarding the prevention of contact tuberculous infections.

Every tuberculous patient, in whom activity of the process is proved or suspected, is isolated. So far, we have had no known contact infections. For those tuberculous patients requiring surgical procedures, separate surgical facilities exist. The prevention of tuberculosis in our hospital is under complete control, and no longer presents the problems that are seen in resistant Staphylococcus infection.

**TREATMENT**

Patients admitted to this hospital with established diagnosis of active tuberculosis were treated as follows: bed rest was initiated immediately; antibiotic treatment and chemotherapy were continued or changed, dictated by manifestation of drug toxicity or drug resistance. If surgical procedures were not contemplated, simultaneous administration of isoniazid, streptomycin and PAS was not instituted, except for renal or meningeal and miliary tuberculosis. A two-drug regimen (isoniazid, streptomycin) or (PAS, isoniazid) was usually sufficient. For our tuberculin-conversion cases, we used only isoniazid. In the initial treatment, the incidence of primary resistance to the three main drugs was low. Sensitivity tests as a routine, therefore, were not done, except in rare cases of clinical failure with the primary chemotherapy. In such exceptionally drug-resistant cases, we tried the second-line drugs: cycloserin, viomycin, pyrazinamide. Complete bed rest sometimes was the best adjunct measure.

The long-term chronic, active tuberculous patient was continued on routine antibiotic therapy and was discharged to the care of the family physician, the outpatient department, or the sanatorium, following subsidence of the acute disease. In cases with cavities with rigid walls, patients were treated surgically.

Early pulmonary infiltrations, precursors of the chronic adult tuberculosis, were successfully treated with antibiotics.

Streptomycin or dihydrostreptomycin was not used in the “delivery” cases because of fear of eighth nerve destruction in the fetus. During labor no narcotic was used; for analgesia meperidine (Demerol) and phenobarbital were administered. For anesthesia, pudendal block or local infiltration was effective.

Six diabetic patients with active or in-active tuberculosis were admitted for anti-diabetic treatment. Only two received insulin. Progression of the tuberculosis was not noted in any of these patients.

Six patients with chronic, active lung tuberculosis in whom rigid cavities were present required lobectomy. Surgery in cases of isolated, small x-ray shadows, suspected of being tuberculosis required highly individualized decisions. Especially difficult is the differentiation between tuberculoma and malignant and benign tumors such as adenoma, hamartoma or cyst. It
was not unusual for us to decide upon surgery when no previous x-ray films of the patient were available. Two with tuberculous pleural exudate were successfully treated with thoracentesis. In three with cervical node tuberculosis, surgical removal was done. In one case of tuberculous salpingitis, the salpinx was removed. One with right hip tuberculosis had sequestrectomy performed. All of these patients received antituberculosis drugs before and after operation.

Early discharge of our tuberculous patients for further treatment outside the general hospital is always considered. The average duration of treatment of the tuberculous patient in our hospital was from only three days to four weeks.

Care of Patients After Hospital Discharge

The general hospital is only a screening station for tuberculous patients admitted for diagnostic and therapeutic purposes. No patient with active tuberculosis is discharged. Antituberculosis drugs and other necessary therapeutic procedures are continued in the sanatorium, at home by the family physician or in the outpatient department.

Post-tuberculous conditions such as fibrosis, pleural adhesions, bronchiectasis, or secondary heart involvement, need special treatment by medication or physical therapy. Proven nontuberculous patients were discharged to the care of the family physician, avoiding transfer to the sanatorium.

In the alcoholic, the diabetic, and the pregnant, the family physician utilized the services of the social service department to solve special problems.

The family is especially educated in methods of isolation and the danger of contact infection.

Our medical staff, private physicians and residents try to persuade patients with active pulmonary tuberculosis to continue treatment in a sanatorium or hospital. Those with acute complications, such as hemoptysis, pleurisy and miliary tuberculosis generally are transferred to these institutions. Patients with chronic pulmonary disease, who have already been treated for years, are especially difficult to treat further in tuberculosis hospitals. This was the disposition of our patients:

<table>
<thead>
<tr>
<th>Referred to</th>
<th>Tuberculosis hospital or sanatorium</th>
<th>Private Physician</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1 meningitis+miliary tuberculosis)</td>
<td>14</td>
<td>15</td>
<td>29</td>
</tr>
<tr>
<td>Active lung tuberculosis with acid-fast positive sputum</td>
<td>(2 with lung findings)</td>
<td>(3 tuberculosis conversion type)</td>
<td>5</td>
</tr>
<tr>
<td>Active lung tuberculosis with negative sputum</td>
<td>Other forms of tuberculosis</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>All forms of active tuberculosis</td>
<td>20</td>
<td>37</td>
<td>57</td>
</tr>
</tbody>
</table>

Our patients with inactive but anatomicallly moderate or far advanced disease who had been treated in the hospital either for late nonspecific pulmonary complication or for other diseases were discharged to the care of the family physician.

Summary

1. One hundred and eleven tuberculous patients were treated medically and surgically in a general hospital from 1953 to 1959.
2. Only 20 patients with active tuberculosis were transferred to tuberculosis hospitals or sanatoria.
3. Thirty-seven patients with active tuberculosis were discharged from the hospital for care by the family physician under the direction of the phthisiologist.
4. Fifty-four patients with inactive pulmonary tuberculosis, who were hospitalized for late nonspecific pulmonary or cardiac complications or for other diseases were screened from transfer to tuberculosis institutions.
5. Many patients were screened for the various forms of acid-fast pulmonary diseases, the diagnosis of nontuberculous pulmonary diseases and the exclusion of these from transfer to the sanatoria, where superinfection is a real possibility.
RESUMEN
2. Solo se pasaron 20 enfermos con tuberculosis activa a hospitales o sanatorios para tuberculosis.
3. Treinta y siete enfermos con tuberculosis activa salieron del hospital para cuidarse por médico de la familia bajo la dirección del tisíólogo.
4. Cincuenta y cuatro enfermos con tuberculosis pulmonar inactiva que fueron hospitalizados por complicaciones tardías pulmonares no específicas o por complicaciones cardíacas o por otras enfermedades fueron apartados del traslado a instituciones de tuberculosis.
5. Muchos enfermos fueron apartados por varias formas de enfermedades por ácido-resistentes, por el diagnóstico enfermedades no tuberculosas y la exclusión de estos del paso al sanatorio, fue determinada en vista de que superinfección es una posibilidad real.

RESUMÉ
1. Cent onze malades tuberculeux furent traités médicalement et chirurgicalement dans un hôpital général de 1953 à 1959.
2. 20 malades seulement atteints de tuberculose active furent transférés dans des hôpitaux pour tuberculeux ou des sanatoriums.
3. 37 malades atteints de tuberculose active eurent la permission de sortir de l'hôpital pour se mettre sous la surveillance du médecin de famille sous la direction d'un phthisiologue.
4. 54 malades porteurs de tuberculose pulmonaire active qui furent hospitalisés pour des complications tardives cardiaques ou pulmonaires indéterminées ou pour d'autres affections furent triés pour être transférés à des institutions spécialisées en tuberculose.
5. Beaucoup de malades furent triés selon les diverses formes des affections pulmonaires tuberculeuses, el diagnostic d'affections pulmonaires non tuberculeuses y leur exclusion para le transfert dans les sanatoriums où la surinfección exogène es una réelle possibilité.

ACKNOWLEDGMENTS: I wish to thank Dr. William J. Messinger and Dr. Edgar Mayer for their help, criticism and valuable suggestions in the preparation of this manuscript.

REFERENCES
7 New York State Department of Health, Guide for the Prevention and Control of Infections in Hospitals.

ZUSAMMENFASSUNG
4. 54 Patienten mit inaktiver Tuberkulose, die stationär behandelt wurden wegen unspezifischer Spätkomplikationen von Seiten der Lungen oder des Herzens oder wegen anderer Erkrankungen, wurden ausgesondert von der Verlegung auf Tuberkulose-Abteilungen.