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A M E R I C A N C O L L E G E O F



C H E S T

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Clinical Aspects, Medical and Surgical, in the Management of Battey-Type Pulmonary Disease*

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FOR THE PAST 12 YEARS, WE HAVE ADMITTED an average of 1,600 patients a year and 1.5 per cent of them have had atypical tuberculosis, or pulmonary disease caused by unclassified mycobacteria, namely, the nonphotochromogen or Battey strain bacillus. Our total experience is based on the management of around 330 patients. The youngest was 30 years of age on admission. Ninety per cent of the patients with this type of disease were over 50 years of age on admission and the average age was 56 years. Sixty per cent were white men, 27 per cent white women, 10 per cent Negro men, and 3 per cent Negro women. These patients came predominantly from rural south Georgia and usually were living on or had resided on farms.

The most frequent complaints were cough, expectoration, weight loss, weakness and dyspnea, followed rather closely by hemoptysis, chest pain, and less frequently with fever and wheeze. If a patient had fever, it was of low grade. We have never seen one come in with temperature over 100°F. The family history was nearly always negative for tuberculosis. The chest x-ray films revealed pathology indistinguishable from tuberculosis. The roentgenograms revealed more fibrosis and emphysema than usually seen in people with *Mycobacterium tuberculosis* infections. Seventy per cent of the patients had one or more of the following complications: pulmonary fibrosis, thickened pleura, bronchiectasis, pneumoconiosis, atelectasis or calcification.

Because of complaints such as those listed above, our patients had been to private physicians or the health department and had x-ray and skin tests. The x-ray film

findings are indistinguishable from pulmonary tuberculosis. The first strength O.T., as used by the Health Department in Georgia, was usually only weakly positive or negative. A second strength test may be necessary to elicit a positive skin reaction. If the sputum studies were positive by smear, the local physician and health department assumed the patients had ordinary tuberculosis caused by *Mycobacterium tuberculosis* and requested hospital admission.

HOSPITAL WORK-UP

These patients appeared chronically ill, never acutely ill. Fifty per cent of them were classified as far advanced on admission, 38 per cent as moderately advanced and 5 per cent as minimal tuberculosis. These patients were ambulatory, but other than a persistent cough and low grade fever, they felt rather well. We have never seen one with an extrapulmonary focus of disease.

All patients coming into our Admission Service are skin tested with 5 T.U. of PPD-S and on the other arm with 5 T.U. of PPD-B. Of the white men, one in four (25 per cent) had a PPD-B skin reaction 6 mm. or more in diameter. This also applies to 22 per cent of the white women. Sixty per cent of the Negro men and 64 per cent of the Negro women had positive PPD-B skin reactions 6 mm. or more in size.

The Admission Service physicians frequently suspect a case of atypical tuberculosis before the cultures are reported. If the patient has a positive direct smear with a low Gaffky count, a PPD-B skin reaction that is larger than the PPD-S skin reaction, if the patient is an older white man, he has about a 45 per cent chance of having atypical tuberculosis. This percentage

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is increased if the PPD-S skin test is negative. The diagnosis is practically never made in the Negro patient prior to the report of the culture. In spite of all clinical leads, however, the patient's disease cannot reliably be distinguished from typical tuberculosis until the sputum cultures and the niacin tests are reported.

PROGNOSIS

When the diagnosis of atypical tuberculosis due to Group III infections is established by culture, the prognosis of the patient changes immediately. His chances of obtaining inactive status are poor. If the disease is localized and the patient is a candidate for surgery, he has a 75 per cent chance of attaining inactive status; but if he is not a surgical candidate and must be treated with drugs alone, he has only a 25 or 30 per cent chance of attaining inactive status.

CLINICAL COURSE

The chronicity of the disease is characteristic. Usually, these patients have been symptomatic for years. Often the pathology is stable for long periods of time. Rarely is the disease rapidly progressive, even without therapy. If the disease kills, it may do so slowly, leading first to pulmonary insufficiency. Prior to the chemotherapy era, if one were to have tuberculosis, this would have been the preferable type. Today, the reverse is true.

PATHOLOGY

The gross pathology is indistinguishable from that of *M. tuberculosis* infections. The patients have residual fibrocaceous disease with nodulation, as well as dirty, cavitary, necrotic lesions. Microscopic pathology is indistinguishable from that of *Mycobacterium tuberculosis*. Intracellular tubercle bacilli are more common in the lesions caused by the Battey strain organism than they are in the lesions caused by *M. tuberculosis*.

If guinea pig inoculation is done with the sputum or even from a positive group III culture, progressive disease does not occur. The patient's organisms are always resistant to isoniazid and about 60 per cent of the

isolates are sensitive to streptomycin. Even though the organisms are susceptible to streptomycin *in vivo*, the drug *in vitro* has a limited beneficial effect and may be given for long periods without the organisms developing *in vivo* resistance. Cultures from removed lung tissues show the same organisms that were found in the sputum preoperatively.

EPIDEMIOLOGY

We have never found a source case. In spite of the fact that well over 95 per cent of the patients we see have been or are married, we have never seen either a husband or a wife also clinically ill with the disease. We have never seen two cases in the same family. This is an entirely different epidemiologic picture than is observed in *Mycobacterium tuberculosis* infections. I mentioned previously that these cases come mostly from rural south Georgia. It has been established that these organisms can be cultured from the soil. This is true in our experience and also in the experience of the Florida investigators. Swine tuberculosis was long thought to be caused by avian tubercle bacilli. Work being done at present indicates that the causative organism of swine tuberculosis may be the Battey strain, a nonphotochromogenic bacillus.

It is our belief that these bacilli stem from the soil or animal kingdom rather than from a human environment, although this has not definitely been established. It has been our belief for years, though, that this disease is not readily communicable from person to person. We believe this is primarily so because of the lessened virulence that this organism has for the human being. We do not advocate a reckless disregard of this infection.

MANAGEMENT WITHIN THE HOSPITAL

We consider this infection to be of low virulence, that drug therapy is very ineffective, that the disease is often chronic and stable over long periods, even without therapy. We realize that these patients might acquire typical tuberculosis from other patients in the sanatorium. Therefore, we isolate them.

Even though we have no successful pattern in regard to the use of drugs, we frequently give them triple drug therapy, consisting of streptomycin, isoniazid, and pyrazinamide. We have tried all drug combinations and none of them is really good.

As mentioned previously, if the patient is a surgical candidate, we recommend early surgical excision of localized lesions, and in this group of patients, we were able to treat 75 per cent of them successfully. Only 25 or 30 per cent of the others will be treated successfully by medical management alone.

In regard to the duration of hospitalization, we keep these patients in the hospital until they have improved clinically and have received maximum x-ray clearance and then discharge them, even though they may have positive sputa. Other patients who may be stable and relatively asymptomatic and not surgical candidates may be discharged rapidly and observed on the outside, rather than kept in the hospital for any period of time.

SUMMARY

The incidence of infection with Battey strain bacillus, as manifested by skin tests, is much higher in the Negro than in the white population. However, the incidence of demonstrable disease is much higher among the white population. The disease is chronic and slowly progressive. It is resistant to treatment. Chemotherapeutic agents are not very effective. Surgical excision of localized disease, in combination with drug therapy, offers the best therapeutic results. The low virulence of the organism leads to a low communicability factor. We do not believe it necessary to keep these patients hospitalized for long periods. There is need for more work in the field of epidemiology to find the reservoir of infection and to find out what can be done to prevent its transmission to the human. There is need for effective drug therapy.

RESUMEN

La frecuencia de la infección con bacilos de la cepa Battey según lo muestran las pruebas cutáneas es mucho mayor en los negros que en los

blancos. La enfermedad es crónica y lentamente progresiva. Es resistente al tratamiento. Los agentes quimioterápicos no son muy efectivos. La excisión quirúrgica combinada con la drogoterapia ofrece los mejores resultados terapéuticos. La baja virulencia del bacilo produce un factor de transmisibilidad bajo. No creemos que los enfermos de estas infecciones sean necesariamente hospitalizados por largo tiempo. Hay necesidad de mayor trabajo epidemiológico para descubrir el reservorio de infección y encontrar lo que puede hacerse para evitar la transmisión al ser humano. Hace falta una drogoterapia efectiva.

RESUMÉ

La fréquence de l'infection avec le bacille de souche Battey, selon les tests cutanés, est plus élevée chez les Noirs que dans la population blanche. Cependant, la fréquence de la mise en évidence de l'affection est plus élevée parmi la population blanche. L'affection est chronique et lentement progressive. Elle est résistante au traitement. Les agents chimiothérapeutiques ne sont pas très efficaces. L'exérèse chirurgicale de l'affection localisée en association avec la chimiothérapie offre les meilleurs résultats thérapeutiques. La virulence faible du microbe conduit à une faible contagiosité. L'auteur ne pense pas qu'il soit nécessaire de garder ces malades hospitalisés pendant de longues périodes. Il est nécessaire de travailler davantage dans le domaine de l'épidémiologie pour trouver le réservoir de l'infection et pour trouver ce qui peut être fait pour empêcher sa transmission à l'homme. Il y a nécessité à trouver une chimiothérapie efficace.

ZUSAMMENFASSUNG

Das Vorkommen einer Infektion mit dem Erreger vom Stamm Battey, wie es sich durch Hautteste nachweisen läßt, erfolgt häufiger bei Negern als in der weißen Bevölkerung. Dagegen ist das Vorkommen einer nachweisbaren Erkrankung häufiger unter der weißen Bevölkerung. Die Erkrankung ist chronisch und langsam fortschreitend. Sie verhält sich gegenüber der Behandlung resistent. Chemotherapeutische Stoffe sind nicht sehr wirksam. Die chirurgische Exzision lokalisierter Krankheitsherde in Verbindung mit medikamentöser Therapie bietet die besten therapeutischen Resultate. Die geringe Virulenz der Erreger bringt es mit sich, daß man die Übertragbarkeit als gering ansehen kann. Wir halten es nicht für notwendig, diese Patienten für längere Zeit stationär aufzunehmen. Es besteht die dringende Notwendigkeit für weitere Bemühungen auf dem Gebiet der Epidemiologie, um das Reservoir für die Infektion zu ermitteln und festzustellen, was man tun kann, um ihre Übertragung auf den Menschen zu verhindern. Ferner besteht die Notwendigkeit, eine besser wirksame medikamentöse Therapie aufzubauen.

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