The Treatment of Tuberculous Tracheobronchitis with Streptomycin

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Introduction

Tuberculous tracheobronchitis is a frequent and important complication or concomitant finding in pulmonary tuberculosis. The stage, extent and course of the pathological bronchial changes usually determine the type of therapeutic procedures to be used for the control of the pulmonary tuberculosis. Treatment of tuberculous tracheobronchitis was unsatisfactory prior to the use of streptomycin. The prevention of chronic bronchial changes, such as tuberculous bronchiectasis and fibrostenosis, will solve many of the therapeutic problems of pulmonary tuberculosis. Successful control of the serious effects of tuberculous tracheobronchitis is essential to obtain satisfactory end results in the treatment of pulmonary tuberculosis.

Early reports by Brewer and Bogen,1 and O'Keefe2 indicated that ulcerogranulomatous lesions of the trachea and major bronchi responded well to combined intramuscular and inhalation treatment with streptomycin. Subsequently, inhalation therapy with streptomycin was found to be irritating and generally its use has been discarded. Pfuetze and Pyle3 state, "Almost without exception, ulcerating and granulomatous lesions of the oropharynx, larynx and tracheobronchial tree have healed within a few weeks when streptomycin was administered." Tucker4 reports, "The effect of streptomycin on tuberculous lesions of the mucosa of the larynx and tracheobronchial tree is striking." The excellent cooperative study by the Veterans Administration, Army and Navy5 on the effects of streptomycin in the treatment of tuberculosis proves rather conclusively that this drug, in varying doses and regimens, is capable of producing improvement in tuberculous tracheobronchitis and tuberculous laryngitis in 80 to 90 per cent of the cases selected for treatment.

Material

Clinical study of 25 patients with proved tuberculous bronchitis is the basis for this report. It is recognized that a presumptive diagnosis of tuberculous tracheobronchitis may be made on the

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basis of clinical and roentgenological findings but only those patients with demonstrable lesions in the major bronchi, as observed bronchoscopically, were included in this study.

The pathological changes observed consisted primarily of ulcerations and granulations with associated hyperemia, edema and infiltration. Those patients who demonstrated only hyperemia, submucous tubercles or slight edema and infiltration were not considered as proved cases. Patients were also excluded if the bronchial tuberculosis had progressed to the stage of apparently healed fibrostenosis.

Bronchoscopic examinations were performed on all of the patients prior to the institution of treatment with streptomycin. Reexaminations were performed at intervals of two to four weeks during treatment and sufficiently often after therapy to determine the subsequent course. All of the bronchoscopic observations were made by the same bronchoscopist so that interpretation of the pathological changes and the results of treatment with streptomycin was uniform.

Treatment

We have been guided, in the main, by the recommendations of the Veterans Administration, Army and Navy in determining the regimens of treatment to be employed. Our earlier cases were given 0.2 gm. or 0.4 gm. of streptomycin by intramuscular injections five times daily for 60 to 120 days. It was soon noted that 1 gm. daily gave results comparable to 2 gm. and the frequency of administration was reduced to every 12 or 24 hours. The duration of treatment has varied from 30 to 120 days.

At the present time 1 gm. of streptomycin dissolved in 2 cc. of normal saline is given daily in a single intramuscular injection. Daily injections are continued for 30 to 90 days. The duration of treatment is determined by the rapidity of healing as observed by bronchoscopic examinations at two to four week intervals.

Plans for the permanent control of the pulmonary tuberculosis, whenever indicated, should be instituted prior to the use of streptomycin. Definitive treatment should be started as soon as feasible while the early beneficial effect of streptomycin is at its peak. Attack on the pulmonary tuberculosis at the earliest possible time is mandatory due to the emergence of resistant strains of tubercle bacilli as a result of treatment with streptomycin. Treatment should be continued only sufficiently long to obtain the desired effects in order to prevent or delay the development of resistant strains.

Results of Treatment

The 25 patients have been observed for a period ranging from
three to 27 months, with an average of 12 months, following completion of treatment with streptomycin. In 12 (48 per cent) of the patients, sputum or gastric cultures were converted from positive to negative. In four (16 per cent) patients, cultures which had converted to negative soon after treatment with streptomycin had been completed subsequently reverted to positive. Tubercle bacilli continued to be found in nine (36 per cent). Streptomycin should not receive the full credit for sputum or gastric conversion since some of the patients were treated subsequently with collapse or resection.

Tuberculous bronchitis was considered healed at the completion of treatment with streptomycin in 12 (48 per cent). In nine (36 per cent) patients the bronchitis was interpreted as showing marked improvement. In three patients slight improvement was noted and in one patient the bronchitis was considered unchanged. However, in two of the patients with slight improvement and in one patient with marked improvement, fibrostenosis subsequently developed.

Seven patients had some form of collapse therapy at the time the tuberculous bronchitis was recognized and in nine others collapse was instituted or resection performed following treatment. Sixteen (64 per cent) were thus aided by some type of collapse or resection in addition to streptomycin.

Comment

Streptomycin is an effective weapon against tuberculous tracheobronchitis. Definitive treatment may now be planned for many patients who formerly were doomed to develop irreversible chronic bronchial and pulmonary changes. Streptomycin must be fitted into a coordinated program of treatment and its use withheld until the optimal time.

The development of resistant strains of tubercle bacilli is the primary drawback to the use of streptomycin. This often precludes its use at a subsequent period when, at times, it may be needed urgently. Toxicity has been reduced to a minor problem since reduction of the standard dosage to 1 gm. daily.

Symptomatic improvement may be dramatic when severe, intractable cough is present. Fever frequently is reduced to normal and there is improvement in appetite and gain in weight. Streptomycin exerts a tonic effect on the general condition.

Streptomycin is not recommended when tuberculous bronchitis has developed to the stage of healed fibrostenosis. Ulcers and ulcerogranulomas respond best and the visible lesions usually heal or show marked improvement within a few weeks. When the diagnosis of tuberculous tracheobronchitis or tuberculous bronchitis is based upon presumptive evidence alone, careful and continued
clinical observation should precede the use of streptomycin and its use should be part of a planned and coordinated attack upon the bronchial and pulmonary tuberculosis.

SUMMARY

1) Streptomycin, in dosage of 1 gm. daily, produced healing or marked improvement in 21 (84 per cent) of 25 patients with acute tuberculous bronchitis.

2) The duration of treatment with streptomycin was determined by repeated bronchoscopic examinations and varied from 30 to 120 days in this series. At the present time treatment seldom exceeds 60 days.

3) Measures to control the associated pulmonary tuberculosis should be instituted as soon as practical after therapy with streptomycin has been completed.

4) Irreversible chronic bronchial and pulmonary changes may be averted by the judicious and timely use of streptomycin.

REFERENCES