

AMBULATORY TREATMENT OF ACTIVE PULMONARY TUBERCULOSIS WITHOUT INTERRUPTION OF NORMAL EMPLOYMENT*

T. F. B. COLLINS,† M.B., B.CH., *Principal Government Medical Officer, Durban Chest Clinic*

When the sole support of a family which is living perilously close to the 'bread-line' is admitted to hospital for treatment of pulmonary tuberculosis, it is a tragedy for his dependants and causes great anxiety for the patient in many instances, because the available financial assistance in the form of grants is inadequate. Small wonder, then, that the patient can only be persuaded to enter hospital with the greatest of difficulty unless he is too ill to request an alternative; nor is it surprising that so many hospital patients cannot settle down to prolonged periods of unemployment, and either abscond or request premature discharge.

For this reason, a supervised regime of twice-weekly therapy at work for minimal or moderately advanced, previously untreated cases of pulmonary tuberculosis with negative sputum on direct-smear examination was commenced at this clinic from the beginning of 1965. The results have been so encouraging that it was decided to extend the scheme to patients with positive sputum from January 1967. This study is presently confined to Durban, and has not yet been formulated as departmental policy for general application throughout the Republic.

The decision was influenced by experience elsewhere which was summed up in a leading article in *The Lancet*,¹ in which it was stated that the risk to contacts, once effective chemotherapy has been started, is negligible; and that there is no evidence that treatment in hospital has any special benefits. The Madras study was a great encouragement, particularly the reports on intermittent treatment of pulmonary tuberculosis,^{2,3} and the study of the influence of segregation of tuberculosis patients for one year on the attack rate of tuberculosis in a 5-year period in close family contacts in South India. It was shown that the incidence of active tuberculosis and tuberculous infections was no greater in contacts of patients treated at home than in contacts of patients treated in a sanatorium, either in the first year or in the subsequent 4 years.⁴ The major risk resulted from exposure before diagnosis, and there was no additional risk to close contacts, provided patients received effective chemotherapy. In a 5-year study of a concurrent comparison of home and sanatorium treatment for one year with isoniazid and PAS, the Madras study showed that home patients responded nearly as well as

sanatorium patients in the first year, and that the relapse rate for home patients was less than that for sanatorium patients.⁵

In summarizing the Madras findings on segregation of tuberculosis patients, the *British Medical Journal* stated in a leading article⁶ that this demonstration that well-organized domiciliary treatment is practicable, effective, and safe for family contacts is of great importance in developing countries with a shortage of sanatorium beds. Our problem in the Republic of South Africa is not so much a shortage of beds, but, as stated earlier, largely one of economics and hardship to the family of a bread-winner with tuberculosis. It was therefore decided to substitute treatment while at work for domiciliary treatment, and to permit patients to continue with their normal occupations from the start. Work contacts were certainly not subjected to any greater risk than home contacts. In fact, the risk is less, since all are adults and the vast majority have already been infected, and reinfection is extremely unlikely. Child contacts at home are further protected by the routine policy of chemoprophylaxis for all intimate contacts of active cases of pulmonary tuberculosis.

THE DURBAN STUDY

The criteria for admission to this study are simple. Any worker with a positive sputum on direct-smear examination (this information being available at the initial examination), and disease of any extent which has not previously been treated, is eligible, provided that the offer of admission to hospital is rejected, the patient is fit and willing to continue in normal employment and the employer, with full knowledge of the patient's condition, is willing to keep the patient at his or her usual work and allow twice-weekly attendance at the clinic for treatment, with periodic follow-up examination. Occupations such as teaching and nursing, which involve intimate contact with persons particularly susceptible to infection, were excluded. Purely by chance, all participants in the scheme to date are males, and with 3 exceptions (Nos. 9 and 35, who are Indians, and No. 7, a Coloured, or person of mixed parentage), all are Bantu.

The design of the study was deliberately made as simple as possible. At each treatment session the patient receives an injection of 2 G of streptomycin, and 4 tablets each containing 300 mg. of Neotizide and 50 mg. of thiaceta-

*Date received: 12 March 1968.

†Present address: Rietfontein Hospital, Orange Grove, Johannesburg.

zone. *These tablets are always swallowed in the presence of the nurse giving the injection, for I believe, with Poole and Stradling,* that 'the total efficiency of fully-supervised intermittent treatment is greater than that of regimens which fail to safeguard against the patients' frailties', and that 'it is impossible to depend upon drugs prescribed for unsupervised oral consumption, indeed, the evidence for this is overwhelming'.

A record of attendances is kept on a treatment card, which also bears the name and telephone number of the employer or some other responsible person who can be contacted immediately if the patient defaults. The hours of attendance of nursing staff have been staggered to provide continuous service from 7 a.m. to 4.30 p.m. on working days, and there is thus usually little or no loss of working time for the patients. Patients are seen by me at intervals of 2 months, when sputum and radiological examinations are carried out and they are weighed.

Knowing that continued employment is dependent on regular treatment, only occasionally has a patient missed a treatment, and then it has been because of circumstances beyond his control. The control of these patients is as good as it is possible to achieve over outpatients, and the exact amount of treatment actually received is known in each case.

Naturally, when the permission of an employer is sought for this form of treatment, the first question usually concerns the risk to fellow-workers; but when it is explained that the major risk resulted from exposure before diagnosis, and that once effective chemotherapy is commenced the risk of further infection is practically non-existent, it is usual to obtain complete cooperation. Indeed, this attitude of lay persons has been one of the most pleasing aspects of the study, and is often in sharp contrast to the reaction of colleagues whose ideas on the subject seem to have been formulated by ancient medical textbooks.

RESULTS

It is possibly somewhat early to draw any firm conclusions, but it was decided to publish this preliminary report in view of the fact that the Durban Chest Clinic, which is at present run by the State Health Department, is shortly to be transferred to the control of the local authority, and with the resultant staff changes it might not be possible to follow these patients beyond the end of 1967. However, it is anticipated that a further assessment will be undertaken after a longer period of treatment and observation.

The patients constitute a highly selected group and furthermore the scheme is characterized by bias from the beginning, based as it is on the expectation of success as a result of previously published studies, and with no control group. There is therefore no intention of drawing statistical conclusions. This report is merely one of clinical response to a set form of therapy under normal conditions of full employment. Nevertheless, it is felt that the success of the scheme to date will prove of great interest to clinicians faced with similar serious and complex tuberculosis problems. Only in the vital assessment of radiological changes was an attempt made to be impartial. The first and last chest X-ray films in each case were submitted to a panel of radiologists not normally engaged in tuberculosis work, and although they were naturally aware of

the nature of the disease, no other information was available to them.

Progress is summarized in Table I, which requires little further explanation.

DISCUSSION

Three patients have been excluded from the scheme because they were admitted to hospital. No. 11 was admitted to a general hospital with severe diabetes 9 days after commencement of treatment, and was subsequently transferred to a chest hospital. The others, Nos. 6 and 26, requested admission to hospital after 2 months and 12 days, respectively, because they felt unable to continue their work, although in the case of No. 6, radiological improvement had occurred and his sputum had become negative on direct-smear examination.

Owing to strict adherence to the original criteria for admission to the scheme, treatment was undertaken in several cases although the patients were probably not suitable for this form of therapy, either because of extent of the disease, particularly cavitation, or because of evidence of pre-existing fibrosis. Nos. 5 and 14, whose sputums have remained positive after 8 and 6 months, respectively, are examples of patients with initial extensive disease with gross cavitation and evidence of fibrosis. Nevertheless, in all but one (No. 19), clinical and radiological improvement has occurred, and with the exception of those mentioned above who were admitted to hospital (Nos. 6, 11 and 26), and No. 7, who left his employment because he was unwilling to perform extra night duties as a cleaner, all have continued in their normal occupations, and not a single day's work has been lost on account of tuberculosis. No. 15 was imprisoned for 14 days for a minor offence after 2 months of treatment, but by arrangement with the prison authorities his therapy continued as prescribed during this short period. No. 25 was given normal leave of absence from his employment for 26 days after completing 2 months of treatment, and for this period only he took 3 of the compound tablets daily without supervision.

In some cases, normal work means hard physical labour. Apart from the 2 patients admitted to hospital because they felt unable to continue their work, there have been no complaints from either employers or patients about inability to work satisfactorily; nor have there been any complaints of adverse reactions to the drugs used, although most of the patients have completed more than 6 months of continuous treatment.

This form of supervised intermittent therapy is suitable for adaptation to almost any set of circumstances with a minimum of facilities and personnel. It can be applied much more widely if the treatment is taken to the patient instead of expecting him to attend a clinic for this purpose, and 'treatment on wheels' is a simple solution when local facilities do not exist at the place of employment. Perhaps it might be advisable to restrict its application to patients with 'early' disease, but the mere fact of positive sputum is certainly not a valid reason for depriving a worker of his livelihood and creating serious problems for his dependants.

Re-education of public opinion is of course necessary before this approach can be adopted on a wide scale, but

and when this will be accomplished can only be determined by a further follow-up study.

SUMMARY

The EEG findings in 20 children who had marasmus in infancy are presented and the records are compared with a control group.

The role of infantile nutrition in the maturation of the electroencephalogram is discussed.

We are grateful to Prof. P. Smythe and Dr M. B. Stoch for making their subjects available to us.

REFERENCES

1. Stoch, M. B. and Smythe, P. M. (1963): *Arch. Dis. Childh.*, **38**, 546.
2. Engel, R. (1956): *Electroenceph. Clin. Neurophysiol.*, **8**, 489.
3. Nelson, G. K. (1959): *Ibid.*, **11**, 73.
4. Stoch, M. B. and Smythe, P. M. (1967): *S. Afr. Med. J.*, **41**, 1027.
5. Davis, H. and Davis, P. A. (1936): *Arch. Neurol. Psychiat. (Chic.)*, **36**, 1214.
6. Mundy-Castle, A. C. (1958): *J. Personality*, **26**, 184.
7. Henry, C. E. (1949): *Monographs on Social Research and Child Development*, **9**, No. 39.
8. Weinbach, A. P. (1938): *Hum. Biol.*, **10**, 145.
9. Nelson, G. K. (1963): Paper read at the Central African Scientific and Medical Congress, Lusaka.