MANAGEMENT OF PULMONARY TUBERCULOSIS DURING PREGNANCY

BY

RONALD B. PRIDIE,* M.B., B.S.

Lately Medical Registrar

AND

PETER STRADLING, M.D., M.R.C.P.

*Chest Physician and Lecturer**From Hammersmith Chest Clinic and the Postgraduate Medical School of London*

It was long held that the first trimester of pregnancy and the immediate post-partum period were particularly dangerous times in the life of a woman with tuberculosis. Review of the literature of recent years, however, shows that there have been numerous papers which failed to support this view.

On the contrary, although statistical proof is lacking, most authors claim that pregnancy has little detrimental effect on the tuberculosis. This conclusion was common in the literature even before the chemotherapy era (Cohen, 1946; Friedman and Garber, 1946; Stewart and Simmonds, 1947).

If the mass of evidence failed to prove the harmfulness of pregnancy before the advent of chemotherapy, how much safer must pregnancy be in the tuberculous woman to-day. This is fully endorsed by many authors (Kruger *et al.*, 1951; Hedvall, 1953; Pugh, 1955; Rosenbach and Gangemi, 1956; Schaefer *et al.*, 1957; Lane, 1957) and by the Joint Tuberculosis Council (1958). In spite of the lack of full statistical proof, it is now reasonable to accept this conclusion.

Nevertheless, some physicians still treat the pregnant woman with quiescent disease by prolonged bed rest, either before or after delivery and sometimes during both periods; some routinely ban breast-feeding even if the mother is non-infectious. The use of chemotherapy is by no means standardized, but termination of pregnancy is now rarely practised for tuberculosis alone. It would seem that even to-day there is not unanimity of practice in managing these patients.

In an effort to reach some logical conclusions in this matter, a retrospective study of the cases managed at Hammersmith Chest Clinic of recent years has been carried out.

Method

The notes of all female patients on the Hammersmith Chest Clinic tuberculosis register in early 1959 were examined. Those patients who had been delivered within five years of previous activity of their tuberculosis were chosen for analysis. Each pregnancy was considered separately, giving a total of 103 pregnancies in 73 patients: some patients thus appear more than once in the analysis of results. Patients whose disease was first discovered during a pregnancy were excluded.

In making the analysis, age, extent of disease, chemotherapy, rest, and breast-feeding were all considered with the relapses in an effort to discover or exclude possible relationships.

A woman was thought to have had active disease within the preceding five years if during that period she

produced a positive sputum or laryngeal swab, and/or showed change in her radiographs. Any patient with a pneumothorax was not regarded as quiescent until it had been abandoned.

Relapses were regarded as possibly related to the pregnancy, and therefore analysed, only if occurring within eight months prior to delivery or in the immediately succeeding year. Such reactivation was defined as the reappearance of either a positive sputum or laryngeal swab and/or radiological spread.

In assessing the extent of disease the grades employed were equivalent to minimal, moderately advanced, and severe of the American system (National Tuberculosis Association, 1950).

When considering the chemotherapy received by the patients, four categories were used: (1) no chemotherapy or less than three months' total chemotherapy; (2) three months' or more chemotherapy during initial treatment only; (3) three months' or more chemotherapy during pregnancy only; and (4) three months' or more chemotherapy during both initial treatment and pregnancy.

Rest was defined as "confined to bed for one month or more prior to delivery." Patients were included in the category "breast-feeding" only if they had continuously suckled for at least one month.

Results

In Table I the age distribution and extent of disease are set out in relation to the chemotherapy given. There is no significant difference between the age groupings in the various chemotherapy categories, and the various extents of the disease have similar distributions.

Table II shows that there was no real difference in the distribution of extent of disease between those patients who suffered a relapse and those who did not. The figures presented in Table III thus are significant: it will be seen that those women who received chemotherapy for the treatment of their original disease suffered a

TABLE I.—Age and Extent of Disease

Chemotherapy	Extent of Disease				Age in Years				
	Min.	Med. Adv.	Severe	Total	-19	-29	-39	40+	Total
None	27	17	7	51	0	27	22	2	51
During initial treatment only	15	3	6	24	3	11	10	0	24
During pregnancy but none initially	3	0	3	6	1	2	3	0	6
Initially and during pregnancy	12	4	6	22	4	10	7	1	22
Total	57	24	22	103	8	50	42	3	103

TABLE II.—Relapse and Extent of Disease

Extent of Disease	Relapse	No Relapse	Total
Minimal	12	45	57
Moderately advanced	5	19	24
Severe	3	19	22
Total	20	83	103

TABLE III.—Relapse and Chemotherapy

	Chemotherapy During Pregnancy			No Chemotherapy During Pregnancy		
	Initial Chem.	No Initial Chem.	Total	Initial Chem.	No Initial Chem.	Total
Relapse	0	0	0	3	17	20
No relapse	22	6	28	21	34	55
Total	22	6	28	24	51	75

*Now at University College Hospital, London.

much lower breakdown rate (3 out of 46=7%) than those who did not (17 out of 57=30%). None of the 28 patients who received chemotherapy during pregnancy relapsed, compared with 20 out of the 75 (27%) who did not. Of those who received neither original nor pregnancy chemotherapy, 33% relapsed.

A further analysis of the relapses showed that the rate for those mothers who breast-fed was only one-fifth of that for those who did not. A valid causal association cannot be assumed here, however, because this finding is open to the criticism that only patients with apparently quiescent disease would be allowed to feed their infants.

There was no difference in relapse rate between the patients who rested and those who did not; but there were only 14 in the resting group. This number is too small to allow of valid conclusions. Other evidence that rest is unnecessary during treatment with chemotherapy is, however, quite convincing (Tyrrell, 1956; Wier *et al.*, 1957; Tuberculosis Chemotherapy Centre, 1959; Tuberculosis Society of Scotland, 1960; Wynn-Williams and Shaw, 1960).

Discussion and Conclusions

In a retrospective survey of this kind there can be no control series and therefore no statistically valid scientific conclusions can be drawn. We can, however, state that the patients who received chemotherapy during pregnancy were reasonably comparable with those who did not, and that they suffered no relapse during pregnancy and during the subsequent year. This effect of chemotherapy is presumably independent of pregnancy.

It will be noted that the relapse rate in those patients who never received chemotherapy is high (20 of 75=27%). Since we can never know what the relapse rate would have been without pregnancies, our findings can throw no new light on the effect of pregnancy on the course of pulmonary tuberculosis.

From our results we can, however, conclude that the pregnant woman with pulmonary tuberculosis that has shown any sign of activity within the previous five years can safely undertake pregnancy and labour without relapse, *provided that she receives adequate chemotherapy at this time*. Furthermore, rest and breast-feeding have no bearing on the prognosis provided chemotherapy is given.

We feel that ambulant chemotherapy should be given on the slightest suspicion of activity either during the pregnancy or in recent years, and that this alone will protect a mother from a tuberculous recrudescence at this critical time. Provided the patient is well and the disease uncomplicated, rest should not be prescribed, and breast-feeding can be allowed by all parents who prove bacteriologically negative; apart from chemotherapy the mother can lead a normal life.

Floridly active tuberculosis is, naturally, another problem, but even in these cases it is our experience that more than a few weeks' rest is unnecessary, and that most cases can be rendered sputum-negative or laryngeal-swab-negative before delivery (and thus often safe to breast-feed) provided the diagnosis is made in reasonable time. The incidence of pulmonary tuberculosis in pregnancy is no less than in the general population. For instance, in the antenatal clinic at Hammersmith Hospital during 1958 and 1959, when

5,386 women had routine chest radiographs, a total incidence of 9.3 per thousand was discovered, about 2 per thousand proving to be previously undiagnosed active cases (Browne and Browne, 1960). Routine antenatal chest radiography, best undertaken in the fourth month of pregnancy to minimize radiation hazards, is thus not only desirable to exclude tuberculosis in the majority but vital to obtain the prompt diagnosis necessary in the few.

Summary

The records of 103 pregnancies occurring in 73 women with pulmonary tuberculosis, active within the previous five years, were analysed in an attempt to discover any relationship between treatment with chemotherapy, rest given during the pregnancy, or breast-feeding on the one hand and subsequent relapse of the disease on the other.

No relationship could be shown between relapse and rest or between relapse and breast-feeding.

Of those patients who received chemotherapy during pregnancy, none relapsed, compared with 27% of those receiving no chemotherapy.

It is concluded that the pregnant woman with pulmonary tuberculosis showing any signs of recent activity can safely undertake pregnancy and labour without relapse provided she receives adequate chemotherapy at this time. In these circumstances rest is unnecessary and the patient can be ambulant.

Non-infectious patients thus treated can safely be allowed to breast-feed after delivery. Even patients found infectious early in pregnancy can often be rendered non-infectious in time to suckle their infants.

The continued application of routine antenatal chest radiography is essential to discover tuberculosis early enough to ensure this adequate control of the disease by the time of delivery.

We are grateful to Professor J. C. McClure Browne for his constructive criticism of this paper.

REFERENCES

- Browne, F. J., and Browne, J. C. M. (1960). *Antenatal and Post-natal Care*, 9th ed. Churchill, London.
Cohen, R. C. (1946). *Brit. J. Tuberc.*, **40**, 10.
Friedman, L. L., and Garber, J. R. (1946). *Amer. Rev. Tuberc.*, **54**, 275.
Hedvall, E. (1953). *Acta med. scand.*, **147**, Suppl. 286.
Joint Tuberculosis Council (1958). *Antenatal and Obstetric Care of Tuberculous Patients and Measures to Safeguard Their Infants*.
Kruger, A. L., Cosgrove, R. S., and Cosgrove, S. A. (1951). *Virginia med. Monthly*, **78**, 417.
Lane, R. M. (1957). *Canad. med. Ass. J.*, **77**, 28.
National Tuberculosis Association (1950). *Diagnostic Standards and Classification of Tuberculosis*, 9th ed. New York.
Pugh, D. L. (1955). *Brit. J. Tuberc.*, **49**, 206.
Rosenbach, L. M., and Gangemi, C. R. (1956). *J. Amer. med. Ass.*, **161**, 1035.
Schaefer, G., Birnbaum, S. J., and Douglas, R. G. (1957). *Ibid.*, **165**, 2163.
Stewart, C. J., and Simmonds, F. A. H. (1947). *Brit. med. J.*, **2**, 726.
Tuberculosis Chemotherapy Centre, Madras (1959). *Bull. Wld Hlth Org.*, **21**, 51.
Tuberculosis Society of Scotland (1960). *Tubercle (Lond.)*, **41**, 161.
Tyrrell, W. F. (1956). *Lancet*, **1**, 821.
Wier, J. A., Taylor, R. L., and Fraser, R. S. (1957). *Ann. intern. Med.*, **47**, 762.
Wynn-Williams, N., and Shaw, J. B. (1960). *Tubercle (Lond.)*, **41**, 352.

The Research Defence Society has published No. 13, *Animal Experiments in the Control of Animal Disease*, in its Conquest Pamphlet series. It costs 6d. from the Society at 11 Chandos Street, Cavendish Square, London W.1.