

PREGNANCY AND TUBERCULOSIS *

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Introduction

As regards the effect of pregnancy on pulmonary tuberculosis ideas have changed from time to time. Hippocrates believed that pregnancy was the best cure for consumption and his opinion was followed blindly along many centuries and pregnancy was recommended as a therapeutic measure for tuberculous girls. From the middle of the nineteenth century there was an increasing tendency to regard pulmonary tuberculosis even when quiescent or arrested as an indication for therapeutic abortion. Pregnancy in tuberculosis was thought to be disastrous and it was propounded that 'for virgin no marriage, for married no pregnancy, for pregnant no confinement and for mother no suckling'. Young in early parts of this century, condemned this dictum as illogical and supported Pinard's opinion, 'treat the disease, manage pregnancy', introduced his own 'prevention is better than abortion'. Change in medical opinion has taken place gradually and it is not now believed that tuberculosis need be a bar to marriage or that pregnancy should not be allowed or even encouraged in a quiescent case of tuberculosis, and lactation is only contraindicated where there is a danger of infecting the baby (Turner 1950).

Review of Literature

Williams, Whitridge (1916 and 1930) with extensive obstetrical experience, regarded the occurrence of pregnancy in women with tuberculosis as a great misfortune and consequently recommended prevention of pregnancy by the most available contraceptive methods.

Rist (1927) observed that pregnancy was a determining factor in onset of tuberculosis in women. He also observed that pregnancy in tuberculous women leads to extension of existing tuberculous lesion and to production of fresh ones. But successful treatment with A.P. had considerable advantage in restoring patient's health. A.P. also had advantage over abortion in that it saved child's life.

Alice Hill (1928) challenged the old view that pregnancy aggravates pulmonary tuberculosis. In a controlled study of pregnant and non-

pregnant tuberculous women she observed that pregnancy had no appreciable effect on the progress of tuberculous disease.

Cohen (1943-1946) and Cohen and associates (1952) observed that by placing the woman under most favourable conditions the risk attached to the pregnancy can be much reduced, the governing factor being whether the pulmonary disease can be brought under control and under such care active pulmonary tuberculosis is seldom accelerated by pregnancy and labour.

Schaefer (1949) observed that tuberculosis which is discovered in puerperium had probably existed many months during and even before pregnancy and it was from this group that the unwarranted accusation that pregnancy disposed tuberculosis was made. He showed that equal number of primigravida and multigravida died (19 and 21 per cent), 4 per cent in each deteriorated and 37 per cent of primigravida and 39 per cent of multigravida showed no change and 37 per cent of each improved. Thus parity had no influence on the disease during and after pregnancy. These results compared favourably well with those obtained in non-pregnant women indicating that pregnancy and labour had no adverse effect on pulmonary tuberculosis.

Soldenhoff and Thornberry (1959) stress that in obstetrics, a change of attitude towards pregnant women suffering from pulmonary tuberculosis has occurred. It is directly attributable to the evolution in treatment of tuberculosis. They also believe that necessity of abortion has vanished with advent of chemotherapy. A woman with active tuberculosis can have it arrested in a short time and become pregnant and can be offered continuance of pregnancy, with every prospect of her tuberculosis being cured afterwards. However, in mothers in whom tuberculosis has been discovered when she is advanced in pregnancy, in spite of all therapy there may be considerable risk, still she can be assured a healthy baby. These authors stress that as tuberculosis death rate has gone down so have the deaths occurring in those cases with pregnancy. They stress

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that obstetric management resolves itself now in treating the patient as prospective mother rather than a sick woman menaced with pregnancy. Such a patient has every chance of carrying the pregnancy through to its conclusion without any danger to herself or child.

Theories Explaining adverse effect of Pregnancy on Tuberculosis

In discussing these theories, various stages of pregnancy should be differentiated. Pregnancy consists of prenatal period, labour and puerperium. The prenatal period is divided into 3 trimesters during which reaction of pregnancy varies. Graveson (1936) observed that there were two critical periods in pregnancy associated with pulmonary tuberculosis: (i) during first trimester and (ii) during and after labour (puerperium).

First Trimester: Vomiting in early months of pregnancy resulting in weakness and weight loss, loss of calcium, elevation of blood cholesterol, hormonal imbalance (low estrogen and high gonadotropin levels in blood), state of hypersensitivity and increased demand of metabolism are the factors which might have adverse effect during first trimester of pregnancy. One of the serious complications in first trimester is hyperemesis gravidarum. Falls (1941) states that the dehydration, depletion of nutrition, starvation, acidosis, avitaminosis and serious toxic neuritis and neurosis occur in some of the cases of hyperemesis gravidarum. These when extreme might be having a damaging effect on any reparative process (tuberculosis in present case) which depends on rest—physical and mental and good nutrition.

Second and Third Trimester: In uncomplicated pregnancy, second and third trimesters are not dangerous periods except possibly presence of gravid uterus interfering with rest and aeration of blood. But complications such as renal damage, eclampsia and antepartum haemorrhage during second and third trimester may have adverse effect on pulmonary tuberculosis.

Labour and Puerperium: Progression of lesions of pulmonary tuberculosis in puerperium has been ascribed to such factors as blood loss during and after labour, use of general anaesthetics, strain of labour, loss of calcium, hormonal imbalance, sudden descent of diaphragm, lysis of involuting uterus and breast feeding.

Socio-economic factors have also been blamed and they appear to be less important.

Controlled studies have shown that pregnancy has no adverse effect on pulmonary tuberculosis. Steward and Simmonds (1947) are of the opinion that child rearing and not child bearing is the major determining factor. Former includes care of infant and its nutrition. The latter is a physiological process of conception, maturation of foetus and parturition with associated metabolic, endocrine and mechanical changes in the mother. Schaefer (1956) states that the months and years following delivery are a more dangerous period for the tuberculous mother than the period of gestation and delivery. Care of the baby after delivery is a social problem and domestic help and financial assistance in the home must be provided 'when necessary. The work, neglect of patients' own rest and the broken sleep while the mother is below par physically, constitute a serious strain for many tuberculous women and decrease their resistance so as to cause reactivation of tuberculosis and for economic reasons they cannot be relieved of these burdens.

Discovery of active tuberculosis in puerperium is a traumatic shock to all concerned. Tendency was to place the blame for the progression on the pregnancy and puerperium. Type, duration and degree of activity of pulmonary lesion, the period of pregnancy at which tuberculosis is discovered, the possibility of providing chemotherapy before and after labour and the nature of individual case are more important factors which may bring about the relapse of the disease. The additional expenses attendant upon the increase in the size of family may, in low income levels place a strain on the budget which will result in a decreased amount of food to a tuberculous mother which may also bring about relapse of the disease. In countries like India repeated pregnancies occurring at close intervals giving no chance to recuperate may also be a factor responsible for break down of already existing tuberculous lesions.

Present Material

I. Incidence of Tuberculosis in Antenatal patients

During 1959-60 1000 antenatal patients who attended the Bai Motlibai Hospital, Bombay 8, and 1000 who attended Cama Hospital,

TABLE 1

Centre	Total Patients x-rayed	Pulmonary Tuberculosis							
		Active		Probably active		Inactive		Total Abnormal	
		No.	%	No.	%	No.	%	No.	%
Bai Motlibai Hospital ...	1000	50	5.0	37	3.7	82	8.2	169	16.9
Cama & Albless Hospital ...	1000	49	4.9	47	4.7	84	8.4	180	18.0

Bombay were X-rayed as a routine during their first visit to the antenatal department. The incidence of active, probably active cases requiring further investigations and inactive cases at the two Centres was as follows: It is quite obvious that there is a high incidence of tuberculosis amongst the pregnant women attending the antenatal department of Bai Motlibai Hospital and Cama and Albless Hospital. Altogether there were 5.0 per cent active cases in the whole series, another 4.2 per cent of the mothers had doubtful shadows needing further investigations and a further 8.3 per cent showed evidence of old healed lesions of the reinfection type of disease or healed Ghon's Focus. A considerable number of the lesions discovered during this examination of the chest in the antenatal clinic becomes obvious. Routine screening of pregnant women has been started at T.B. Clinic, J. J. Govt. Hospital since 1958. Of the total 2063 women screened 93 (4.5 per cent) showed active pulmonary tuberculosis needing treatment. The 1000 mothers from Bai Motlibai Hospital who were X-rayed, were also screened before being X-rayed and only in 5 out of 50 active cases, the lesions were missed on screening and spotted on X-ray plates.

II. Observation of patients with active tuberculosis during pregnancy and after delivery

The study was undertaken during the year 1959-60. Patients in this study were from the poor class of society, living in crowded, one room tenements in chawls. Ignorance, illiteracy and poverty played a major role in their lives.

These patients were classified in 3 main groups as follows:

Group I: Patients known to be suffering from pulmonary tuberculosis before the onset of pregnancy.

Group II: Patients having symptoms suggestive of pulmonary tuberculosis during their pregnancy.

Group III: Patients detected only because of routine X-ray of chest in antenatal period. In these patients special efforts were made to elicit the history of symptoms by repeated questioning but none of the patients gave such history.

1. Initial Observation

Table 2 shows the distributions of patients in 3 main groups and also according to the activity of the disease present when tuberculosis was first diagnosed during pregnancy.

TABLE 2

Main group	Activity of disease			
	Active	Probably Inactive	Total	Percentage
I	26	5	31	52.5
II	19	0	19	32.2
III	6	3	9	15.3
Total	51	8	59	100.0

31 (52.5 per cent) of 59 patients were previously known cases of tuberculosis and were taking treatment for some time before they

conceived (Group I). There was history of onset of symptoms of tuberculosis in relation to some previous pregnancy in 14 patients from this group. 17 patients did not give such history. 19 patients (32.2 per cent) have symptoms such as cough, expectoration, low fever, loss of weight, etc., sometimes during pregnancy (Group II). All but one patient from this group denied any history of pulmonary tuberculosis before the pregnancy supervened. One patient gave history of pleurisy with effusion 6 years prior to this attack. Diagnosis of pulmonary tuberculosis in all these patients was suspected from symptoms and confirmed by chest X-ray. 9 patients (15.3 per cent) were diagnosed as suffering from pulmonary tuberculosis during routine radiographic examination of the chest (Group III). On repeated questioning to these patients, it was confirmed that they did not have any symptoms of pulmonary tuberculosis.

Age: 58 of 59 patients were in the age group of 15-35 years. Majority of them i.e., 49 (83 per cent) of 59 patients were in the age group of 21-30 years.

Parity: 6 (10.2 per cent) of the 59 patients were primigravida and 53 (89.8 per cent) were multigravida. The maximum number of cases were seen as II, III, IV and V gravida.

Duration of Pregnancy when first attended the Clinic:

Only 8 (13.6 per cent) of 59 patients came under observation during first trimester of pregnancy, 22 (37.2 per cent) of the patients came under observation during second trimester and 29 (49.2 per cent) during third trimester of pregnancy. Thus majority of patients came under observation when the pregnancy was well advanced.

Radiographic extent of disease at first presentation:

Of the 59 patients 8 patients had probably inactive disease as assessed by their chest radiographs. 51 patients had active disease. The distribution of patients according to the radiographic extent of disease was as follows:

11 (21.6 percentage) of 51 patients had 'MINIMAL' disease. Of these 5 were detected as suffering from pulmonary tuberculosis on routine chest radiography, 5 had symptoms suggestive of pulmonary tuberculosis and one was already on treatment for tuberculosis.

TABLE 3

Group of Patients	Radiographic extent of disease		
	Minimal	Moderately advanced	Far advanced
I	1	14 (9)*	11 (11)
II	5	11(6)	3 (3)
III	5	1	0
Total	11	26 (15)	14 (14)
Percentage	21.6	51.0	27.4

* Parenthesis indicate number of patients with cavitary disease.

26 (51.0 per cent) of 51 patients had 'MODERATELY ADVANCED' disease. Of these only one was diagnosed on routine chest radiography examination, 11 had some symptoms during pregnancy and 14 were already on treatment. 14 (27.4 per cent) of 51 patients had 'FAR ADVANCED' disease. Of these 3 had symptoms during pregnancy and 11 patients were already under treatment when pregnancy supervened.

Sputum Examination: Of the 51 patients with active disease only 18 (35.3 per cent) showed acid fast bacilli on direct smear examination. Repeated smear examination and cultural studies would have definitely yielded more positive results, but such studies were not possible (8 patients with probably inactive disease are not included here).

Erythrocyte sedimentation Rate: E.S.R. at time of first examination is shown in Table 4.

In pregnancy also the E.S.R. increases so it is very difficult to assess the activity of disease on the basis of E.S.R. Even here the E.S.R. does not show any relation to activity of disease or its extent. 45 patients had E.S.R. values 31 to 60 mm., only one had E.S.R. values between 11-20 mm. and his disease was 'probably inactive'. 6 patients had E.S.R. value between 21-30 mm. of, these 3 patients probably inactive disease. 7 patients had E.S.R. value between 61 to 70 mm.

TABLE 4

E.S.R. in mm.	Active disease			Probable Inactive disease	Total
	Minimal	Moderate Advanced	Far Advanced		
0-10	0	0	0	0	0
11-20	0	0	0	1	1
21-30	0	*	'	3	6
31-40	*	5	2	1	13
41-50	2	8	1	1	12
51-60	4	9	5	2	20
61-70	0	2	5	0	7

Previous Treatment: 28 (47.5 per cent) of 59 patients had not taken any antituberculosis chemotherapy before. Of these 3 patients had probably inactive disease. 11 (18.6 per cent) were taking chemotherapy at the tuberculosis clinic when pregnancy supervened. Of these one had probably inactive disease which must be the result of continuous treatment for one year prior to time pregnancy was diagnosed. Her previous X-ray had shown active disease. 20 (33.9 per cent) patients had taken treatment sometime back (period varying from 1 to 6 years). At that time when pregnancy was confirmed they were not under treatment. All these patients had irregular treatment. Of these 4 patients had probably inactive disease.

2. Response to Treatment

Majority of patients received isoniazid 100 mg twice a day and streptomycin 1 Gm twice a week. In very few cases PAS was added. One patient received isoniazid only. Patients continued treatment for a varying period from 6 to 12 months.

There were 6 patients whose period of observation was less than 6 months and there was one patient whose observation was continued for more than one year. 24 of 51 patients with active disease were regular in attendance for treatment and 27 were irregular. 8 patients with probably inactive disease were also irregular. Majority of these patients did not attend for a month or two after delivery as they left the place and some were irregular for no obvious reason. All patients delivered normally and then again started attending the clinic, after a variable period of 2 to 6 weeks.

Radiographic changes:

The two radiographs from each of the 8 patients with probably inactive disease did not show any change in the lesion. This confirmed that the disease was inactive from the beginning of the observation period. These patients have been excluded from the subsequent analysis.

Of the 51 patients with active disease, 30 (58.8 per cent) improved, 4 (7.8 per cent) showed no change in radiographic shadows and 17 (33.3 per cent) deteriorated.

Relation of radiographic changes to the initial extent of the disease:

Of the 11 patients with minimal disease 10 (90.9 per cent) improved and only 1 (9.1 per cent) deteriorated. Of the 26 patients with moderately advanced disease 15 (57.7 per cent) improved 2 (7.7 per cent) showed no change and 9 (34.6 per cent) deteriorated. Of the 14 patients with far advanced disease 5 (35.7 per cent) improved 2 (14.3 per cent) showed no change and 7 (50.0 per cent) deteriorated. Thus it is obvious that there is definite correlation between response to treatment and the initial extent of disease.

Relation of radiographic changes to the regularity of treatment:

Of 51 patients, 24 were regular in treatment. Of these 19 (79.2 per cent) improved, 2 (8.3 per cent) showed no change and 3 (12.5 per cent) deteriorated. Of the 27 patients who were irregular in treatment, 11 (40.7 per cent) improved, 2 (7.4 per cent) showed no change and 14 (51.9 per cent) deteriorated. The relation of initial extent of disease, radiographic response and the regularity of treatment is shown in Table 6.

TABLE 5

Extent of the disease	Radiographic changes						Total	
	Improved		No change		Deterioration			
	No.	%	No.	%	No.	%	No.	%
Minimal	10	90.9	0	0.0	1	9.1	11	100.0
Moderately Advanced	15	57.7	2	7.7	9	34.6	26	100.0
Far Advanced	5	36.7	2	14.3	7	50.0	14	100.0
Total	30	58.8	4	7.8	17	33.3	51	100.0

TABLE 6

Initial extent of disease	Radiographic change					
	Improved		No change		Deterioration	
	Regular	Irregular	Regular	Irregular	Regular	Irregular
Minimal	5	5	0	0	1	0
Moderately advanced	9	6	1	1	0	9
Far advanced	5	0	1	1	2	5
Total	19	11	2	2	3	14
Percentage	63.3	36.7	50.0	50.0	17.6	82.4

TABLE 7

Main group	Radiographic changes						Total	
	Improved		No change		Deterioration			
	No.	%	No.	%	No.	%	No.	%
I	10	38.5	4	15.4	12	46.2	26	100.0
II	15	78.9	0	0	4	21.1	19	100.0
III	5	83.3	0	0	1	16.7	6	100.0

Of the 30 patients who improved, 19 (63.3 per cent) were regular and 11 (36.7 per cent) were irregular in treatment. In 4 patients who showed no radiographic change, the regularity of treatment was not an important factor at all. Of the 17 patients who deteriorated, 14 (82.4 per cent) were irregular in their treatment, only 3 (17.6 per cent) being regular in their treatment. This is a significant observation especially in patients with moderately advanced and far advanced disease.

Radiographic response and mode and time of diagnosis of pulmonary tuberculosis:

Of the 26 previously known active pulmonary tuberculosis (Group I) 10 (38.5 per cent) improved, 4 (15.3 per cent) showed no change and 12 (46.2 per cent) deteriorated. Of the 19 patients who had some symptoms during pregnancy (suspected to be suffering from tuberculosis and confirmed by radiography—Group II) 15 (78.9 per cent) improved while 4 (21.1 per cent) deteriorated. Of the 6 patients in whom diagnosis was made on routine chest X-ray examination (Group III) 5 (83.3 per cent) improved while only 1 (16.7 per cent) deteriorated. This necessarily indicates that patients who have taken irregular treatment for long time do not respond very well to the treatment. Patients who have some symptoms suggestive of pulmonary tuberculosis fared better than above group. But patients who have been diagnosed in presymptomatic stage fare best barring few cases which were irregular in treatment or which might be excreting drug resistant organisms.

Relation of Descent of Diaphragm after parturition to Radiographic Response:

Of the 59 patients in 32 the diaphragm descended by one or two intercostal spaces after delivery. In spite of this descent, 17 of 32 (53 per cent) patients showed radiographic improvement. 8 (25 per cent) patients showed no radiographic change. In 6 of these the disease was radiographically inactive at the beginning and descent of diaphragm did not cause any reactivation. 7 patients (22 per cent) showed deterioration. This was attributed more to the irregularity of treatment than the descent of the diaphragm. In 27 patients the diaphragm did not descend after delivery. Of these 13 (48 per cent) improved, 4 (15 per cent) showed no change and 10 (37 per cent) deteriorated radiographically. This shows that deterioration is not necessarily associated with descent of diaphragm.

Sputum Conversion in relation to radiographic changes at the end of observation period:

At the beginning sputum from 18 out of 51 patients (35 per cent) showed acid fast bacilli on direct microscopic examination of one smear, while that of 33 patients (65 per cent) did not show acid fast bacilli. At the end of observation period there was no significant change in the incidence of sputum positivity, 16 patients (31 per cent) having positive sputum and 43 (69 per cent) having negative sputum. Apparently only 2 patients converted to negativity. But if sputum result and the radiographic response are related it is observed that of the 6 patients who showed radiographic improvement

TABLE 8

Level of Diaphragm	Radiographic changes						Total	
	Improved		No change		Deterioration		No.	%
	No.	%	No.	%	No.	%		
Descend	17	53	8(6)*	25		22	32	100.0
Non-Descend	13	48	4(2)	15	10	37	27	100.0
Total	30	...	12(8)		17		59	

* Parenthesis indicate number of patients with probably inactive disease.

TABLE 9

Radiographic change	State of sputum at onset	No. of Patients	State of sputum at the end of observation period	
			Positive	Negative
Improved	Positive Negative	6 24	0	5 24
No change	Positive Negative	2 2	1	0 2
Deterioration	Positive Negative	10 7	103	0 4
All patients	Positive Negative	18 35.0% 33 65.0%	16 31%	35 69.0%

(8 patients with probably inactive disease had negative sputum throughout and are not included here)

and had positive sputum at the onset, 5 converted to negative status and one maintained positive status at the end of observation period. On the other hand, of the patients who showed radiographic deterioration, 10 maintained the positive status of sputum at the end of observation period. In addition, of the 7 patients who had negative sputum at the beginning 3 became positive thus increasing the number of patients with positive sputum to 13 at the end.

Changes in E.S.R. at the end of Observation period:

It was observed that there was a fall in ESR in majority of patients because the number of patients with high ESR values decreased and that with low ESR values increased at the end of observation period as compared with the distribution of patients according to ESR values at the onset.

3. Fate of Infants

Of the 60 infants born (one was twin pregnancy) 6 infants died, 4 within one month of their birth and 2 later. One was a prematurely born (8 months) and died on the 3rd day after delivery, cause of death being prematurity and dehydration, one had some congenital anomaly and died immediately after birth; two died on 7th day after delivery due to diarrhoea and vomiting. Of the later two infants, one died two months and another 8 months after delivery. Exact cause of death could not be ascertained in 4 of the 6 deaths.

Most of infants were given B.C.G. vaccine

TABLE 10

E.S.R.	At the Onset		At the end	
	No.	%	No.	%
11-20	1	1.7	10	16.9
21-30	6	10.2	10	16.9
31-40	13	22.0	17	28.8
41-50	12	20.3	5	8.5
51-60	20	33.9	13	22.0
61-70	7	11.9	4	6.8
Total	59	100.0	59	99.9

within 24 hours of birth. Those who missed B.C.G. vaccine at birth were vaccinated within one month after tuberculin testing. The mothers who were expectorating acid-fast bacilli and having active disease were advised to avoid breast feeding of their infants and to separate the infants from them. Such measures were not adopted for the infants of the mothers who were showing signs of quiescence and those who had become non-infective.

Discussion

Incidence of active pulmonary tuberculosis as assessed by routine X-rays of 2,000 patients is 5.0 per cent. On screening 1,000 women attending Bai Motlibai Hospital, 5 out of 50 active cases were missed. These could be spotted only by chest X-rays. Thus screening is quite comparable with X-ray examination and can save the cost of X-raying all antenatal women. Those who show suspicious shadows on screening should be X-rayed for confirmation. In places where Mass Miniature Radiography is possible, it could be successfully and economically used instead of screening.

The prevalence of active tuberculosis as observed in present study is quite high as compared with the prevalence of disease in general population. According to the National Sample Survey carried out in our country the prevalence of active or probably active disease in India is about 1.3 to 2.5 per cent.

Schaefer (1956) says that the reported incidence of tuberculosis in pregnancy is dependent on the efforts made to diagnose it. According to his observations by routine X-raying of women in antenatal period the incidence of significant tuberculosis is about 3 times more than is observed by history taking and physical examination.

Heaf and Rusby (1948) stress that risk to the mother is directly related to the extent and severity of the disease so it is desirable that tuberculosis, if present should be detected as early as possible. The best method of doing this is X-raying the chest of every pregnant woman at her first attendance to antenatal clinic and that the antenatal group of women should be on a high priority list of Mass Radiographic surveys.

In this study it has also been attempted to assess the effect of pregnancy upon pulmonary tuberculous lesion—active and probably inactive. It summarises the effects as observed on a poor class of patients attending general hospitals in Bombay. These patients were mostly illiterate, poor and living in unhygienic crowded localities. All patients were ambulatory.

It was not possible to compare these patients with a group of non-pregnant tuberculous women of same age group, socio-economic standards and having similar type of disease and treated in the same way. This would have given us the exact idea of effect of pregnancy on

pulmonary tuberculosis. Another drawback is that the observation period was very short, as it is now accepted that the minimum period of treatment should be at least one year.

Most of the patients reported themselves for antenatal supervision during second and third trimester of pregnancy, so effect of early pregnancy on tuberculous lesions could not be studied and therapeutic abortion was out of the question here.

The important age group in which the majority of the patients were seen in present study was 21 to 30 years of age. 49 (83.0 per cent) of the 59 patients were seen in this age group. It has been observed that the morbidity and mortality rates in females are at their peak in this particular age group and then there is an abrupt fall. Pregnancy and child bearing have been blamed for this.

Majority of the patients in present study were multigravida. 42 (71.1 per cent) of 59 patients were seen 2nd 3rd 4th or 5th gravida as against only 6 (10.2 per cent) in primigravida. Schaefer (1949) has observed almost equal incidence of pulmonary tuberculosis in primigravida and multigravida. Higher incidence in multigravida in our series may be explained by the fact that in India marriages take place at early age and there are repeated and unplanned pregnancies.

Results in this study point out the effects of inadequate and irregular treatment of tuberculosis for want of drugs and non-co-operation, poverty and ignorance of patients in general and about tuberculosis in particular.

Patients have been classified in different groups to assess the effect on pregnancy on pulmonary tuberculosis. This type of classification was adopted by Turner (1950).

Cohen (1936) reported that in women with questionable tuberculosis or with definite but inactive tuberculosis, child bearing did not have any adverse effect even in adverse social circumstances. Steward and Simmonds (1943) and Turner (1950) also demonstrated that prognosis of quiescent tuberculosis is not adversely affected by pregnancy. In the present study there were eight cases of 'probably inactive disease' and none of them was affected adversely by pregnancy.

In the present study 31 (52.5 per cent) of 59 patients were suffering from pulmonary tuberculosis before they had conceived. The disease

was active in 26 of these 31 patients. The best advice for these patients would have been to avoid pregnancy till the lesion heals. This was not possible because of sheer negligence as well as ignorance about tuberculosis on the part of these patients. 12 (46.2 per cent) of 26 patients with active disease from this group deteriorated, the main causes of deterioration being irregularity of treatment and the chronicity of the disease. The probability of the emergence of drug resistant strains of tubercle bacilli cannot be ruled out. But as it was not possible to do drug sensitivity test studies due to lack of facilities for doing so this could not be confirmed. In some cases the lesions were such that only surgery would have helped to get rid of the disease and final healing. In the other two groups of patients whose tuberculosis was detected for the first time during pregnancy fared well as compared with the above group.

The majority of patients in the present study were seen with moderately advanced and far advanced disease, only 11 (21.6 per cent) of the 51 patients with active disease having minimal tuberculosis. It was observed that the prognosis of patients was definitely related to extent of disease. 90.9 per cent of the patients with minimal disease improved as against 57.7 per cent and 35.7 per cent of those having moderately advanced and far advanced disease respectively. 9.1 per cent, 34.6 per cent and 50.0 per cent patients with minimal, moderately advanced and far advanced disease respectively deteriorated.

Observations relating response to the regularity of treatment were equally important. It was observed that the patients who were regular for treatment have fared better than those who were irregular. Hence one should stress regularity of treatment to every patient whatever may be the extent of the disease.

It was obvious in present study that the descent of diaphragm was not of any importance as far as prognosis of tuberculous patients after parturition. Of the 17 patients who deteriorated only in 7 the descent of diaphragm was seen. On the other hand of the 30 patients who showed improvement, 17 had shown descent of diaphragm. In 6 out of 8 patients with probably inactive disease the diaphragm descended but there was no reactivation of disease. This disproves the observation of many workers that descent of diaphragm is the cause of deterioration in the postpartum period.

Follow up of the infants was not up to date. 6 of the 60 infants died, 4 within first month of their birth, 1 in the second month and 1 in the eighth month. In two infants the cause of death was obvious (one prematurity and dehydration; another congenital anomaly). Pulmonary lesion in the mothers of these two infants was showing improvement radiographically and their sputum was persistently negative. In the other four infants who died it was difficult to assess the cause of death. Mothers of two children had probably active disease (Sputum negative) and in third the disease was active but had responded well to treatment and sputum was negative from the beginning. Mother of the 4th child had active disease with positive sputum at the beginning. She deteriorated in spite of treatment and sputum remained positive. It is probable that the cause of death of infant of this mother may be tuberculosis but there was no definite proof for it.

Rest of children fared well. All were B.C.G. vaccinated.

Summary and Conclusion

59 patients of pregnancy associated pulmonary tuberculosis are studied. 31 patients (52.5 per cent) were previously known cases of pulmonary tuberculosis when they first attended the antenatal clinic. 19 patients (32.2 per cent) were suspected to be suffering from pulmonary tuberculosis when they attended the antenatal clinic and diagnosis confirmed by chest X-ray examination. 9 patients (15.3 per cent) were diagnosed on routine antenatal chest X-ray examinations.

Majority of patients (48 of 59) were from the age group 21 to 35 years.

53 patients (90 per cent) of them were multi-gravida.

Most of them came under observation for first time in the later half of pregnancy.

8 patients had probably inactive disease and 51 had active disease. Of these 51 patients, 11 (22 per cent) had minimal disease. 26 (51 per cent) had moderately advanced disease and 14 (28 per cent) had far advanced disease. 18 of 51 patients (36 per cent) showed A.F.B. on direct smear examination of the sputum.

Response to treatment as assessed by radiography was related to initial extent of disease, regularity of treatment and relation of onset of disease to pregnancy. At the end of observa-

tion period, of the 51 patients with active disease, 30 (58.8 per cent) showed improvement, 4 (7.18 per cent) showed no change, 17 (33.4 per cent) deteriorated. The 8 patients with probably inactive disease did not show any radiographic changes.

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