The Influence of Pregnancy and Delivery on Pulmonary Tuberculosis

(Clinical observations on pregnancies observed in tuberculous patients at the Malben Hospital for Chest Diseases, in the years 1952-1957).

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The problem of the influence of pregnancy on pulmonary tuberculosis has for many years engaged the attention of lung specialists, as well as that of obstetricians. Judging from the numerous recent studies on this subject, great importance is attached to this problem even today.

In the last century, tuberculosis cases discovered during pregnancy reached 0.5 per cent (Cooper). With the introduction of routine fluoroscopy during pregnancy, discovered tuberculosis cases rose, and reached 1.5 per cent to 2 per cent (Giselle). According to a report by Schaefer, covering the years 1952-1957, i.e., since the beginning of the antimicrobial era, there was no change in the incidence of tuberculosis complicating pregnancy. This shows that the tuberculosis-pregnancy problem is still acute.

Until the middle of the 18th century, it was believed that pregnancy, and particularly delivery, were beneficial to the tuberculous process. Little by little, the majority of authors and research workers modified this point of view and became convinced that pregnancy and delivery were detrimental to tuberculosis. The number of abortions for tuberculosis increased to such proportions that in 1923, Rist, Pankow and others declared that it was necessary to interrupt a pregnancy in every case of active tuberculosis, so as to prevent exacerbation of the disease after delivery.

This was the common concept until 1950. In a survey of 120 deliveries during 1950, Simpson and Long proved the ill effects of delivery on active tuberculosis and they recognized a close connection between the stage of tuberculosis before delivery, and the rapid progress of the disease following it. They also shared the opinion that pregnancy should be interrupted in cases of active tuberculosis.

This opinion was radically changed by the modern treatment of pulmonary tuberculosis, i.e., the antimicrobial and surgical treatment. As a result of this treatment, the number of exacerbations following delivery dropped to such an extent that it did not exceed that prevalent in other cases of tuberculosis. There was a marked decrease in the number of indications to interrupt pregnancy for tuberculosis and today, if such measure is resorted to, it is mostly due to social reasons.

Material and Methods

This paper is based on the review of the clinical histories of 55 women who were delivered during the period 1952-57. They were hospitalized

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at Beer Yaacov Hospital in a special ward where they were treated by a team of workers trained for attending such patients. The deliveries took place in the maternity ward of “Asaf Harofe” Hospital, which is located in the vicinity of our hospital. A few days after delivery, they were returned to us and treatment continued. In 31 (56 per cent) of the cases, the disease was discovered on routine x-ray film examination during pregnancy. Of these, 22 suffered from tuberculosis, 11 of them with cavitations. Of the rest, 24 cases were old tuberculosis patients, who suffered from the disease for many years, some of them with chronic active disease and most of them with inactive lesions. It is a firm belief in our country that hospitalization of pregnant tuberculous women for delivery purposes protects them from a relapse in tuberculosis and for this reason the chest clinicians used to hospitalize the great majority of such patients even with inactive disease.

The newborn babies were separated from their mothers immediately after delivery, and were given BCG and then transferred to proper institutions for the duration of their mothers' stay in the hospital.

The age of the patients ranged from 18 to 40. Thirty-five of them were admitted with active, and 20 had inactive lesions.

The distribution by stages of disease was as follows:

<table>
<thead>
<tr>
<th>Stages</th>
<th>BK-positive with cavitation</th>
<th>BK-negative</th>
<th>INACTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderately advanced</td>
<td>13</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Far advanced</td>
<td>6</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>19</td>
<td>16</td>
<td>20</td>
</tr>
</tbody>
</table>

Of the 35 cases of active tuberculosis, 19 had cavitation (BK+). For 28 of the patients this was their first delivery, while for 27, their second or more. Those with active tuberculosis were immediately, upon the discovery of the disease, hospitalized in the fourth or fifth month of pregnancy. Those with inactive lesions were hospitalized in the eighth month of pregnancy, with the total length of hospitalization not exceeding four months.

During the years 1952-1955, all the patients received PAS and Nicotinbin during pregnancy. In the last month of pregnancy and following delivery we also added streptomycin. Patients with severe tuberculosis received streptomycin also during pregnancy. From 1956 on, all with active tuberculosis received the three drugs immediately upon entering the hospital, and for the duration of their hospitalization. The antimicrobial treatment was given for six months up to two years, depending on the stage of the disease.

In one case, a segmentectomy was performed in the fourth month of pregnancy. In five of far advanced tuberculosis with cavitation of the lower lobes, we induced pneumoperitoneum after delivery and maintained it for a few months — in one of them, for about three years.
Results

The post-partum clinical course of the tuberculous process was observed in the hospital and after discharge from the chest clinics for periods ranging from five months to five years.

| DURATION OF FOLLOW-UP OF THE PATIENTS AFTER DELIVERY |
|-----------------------------------------------|-------|-------|
| Time            | Active | Inactive |
| Up to 6 month   | 12     | 9      |
| Up to 12 months | 9      | 5      |
| 1 — 2 years     | 7      | 1      |
| 3 — 5 years     | 8      | 4      |
| TOTAL           | 36     | 19     |

Among the patients with inactive tuberculosis there was no case of exacerbation of the disease during the follow-up period. Among 35 patients suffering from active tuberculosis, 33 showed signs of improvement during pregnancy which persisted after delivery. Some of these women had far advanced cavitary tuberculosis which prior to the introduction of antituberculous drug treatment could not have reasonably been expected to go through with delivery without serious risk to life. Even these patients were delivered without difficulty and their post-partum clinical course was satisfactory.

In two cases only, there appeared an exacerbation of the disease during the first three months following delivery. Out of 19 patients suffering from tuberculosis with cavitation, 16 (84 per cent) became bacillus of Koch negative either during pregnancy, or after delivery; three remained bacteriologically positive. In not one case where a patient was negative during pregnancy did she become positive after delivery.

The following table illustrates the patients' state of disease at the end of the follow-up:

Case Reports

M.R., had far advanced bilateral pulmonary tuberculosis, with a giant cavity in the right lower lobe, bacillus of Koch strongly positive (Fig. 1). She was hospitalised in
the seventh month of pregnancy in 1954. After receiving antimicrobial treatment, the cavity shrank considerably and marked absorption of the infiltrative changes was noted. After delivery, pneumoperitoneum was induced, the condition of the lungs improved gradually, and the cavity closed. She left the hospital well, bacillus of Koch negative (Fig. 2).

R. C., 21 years old, was hospitalized in December, 1954 because of exudative far advanced pulmonary tuberculosis, with a giant cavity in the right middle lung field (Fig. 3). In June, 1955, she became pregnant and was successfully delivered in March, 1956. After delivery pneumoperitoneum was induced. An x-ray film four months after delivery showed considerable improvement in the tuberculous process, i.e., disappearance of the giant cavity and absorption of the infiltrative changes (Fig. 4).

![FIGURE 3](Image)

**FIGURE 3**

![FIGURE 4](Image)

**FIGURE 4**

<table>
<thead>
<tr>
<th>ACTIVE</th>
<th>Koch bacillus positive with cavitation</th>
<th>BK-negative</th>
<th>INACTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Moderately advanced</td>
<td>2</td>
<td>2</td>
<td>48</td>
</tr>
<tr>
<td>Far advanced</td>
<td>3</td>
<td>2</td>
<td>50</td>
</tr>
</tbody>
</table>

**Discussion**

After reviewing the material and checking the results of the treatment and the follow-up of patients after delivery, it seems to us that the fundamental problems to be answered are as follows:

a) Do pregnancy and delivery cause exacerbation of tuberculosis?
b) Should pregnancy be interrupted in cases of active tuberculosis?
c) What is the health condition of children delivered of mothers suffering from tuberculosis?

It seems from our findings that in the era of modern antimicrobial treatment, and especially long-term treatment, combined with moderate lung excisions, there is no reason to be afraid of exacerbation of the disease after delivery. The antimicrobial treatment, provided that full sensitivity to such drugs does exist, guarantees against exacerbation of the disease during and following delivery. The clinical course of active tuberculosis during pregnancy and after delivery is not substantially different from that in non-pregnant women and the lesions respond to antimicrobial treatment during pregnancy and after delivery in a satisfactory manner.

The antimicrobial treatment also permits excisions in the early months of pregnancy without untoward effects on the pregnancy. According to our experience, the percentage of exacerbation is quite low and it is similar to that shown in the report of Schaefer, which is based on a follow-up of 255 women. Pregnancy and delivery have no effect whatsoever on inactive tuberculosis. According to our material, as well as
INFLUENCE OF PREGNANCY ON PULMONARY TB

Figure 7

Figure 6

Figure 5

1. H. 22 years old, who had suffered for many years from her advanced pulmonary tuberculosis on the left side with cavitation, be-

progressed her form rashes.

Pulmonary tuberculosis and active, tuberculosis, development and its is probably the reason why antituberculous drugs treatment given during pregnancy and after delivery.

The disease (Fig. 7). She has been considered to be the best possible. It is worth noting that in spite of prolonged treatment, no change occurred in February, 1951. She was hospitalized again and x-ray film taken two months after delivery did not show extension of disease nor any deterioration in the patient's condition (Fig. 6). In spite of continued treatment, she became pregnant again and
came pregnant in 1955. She entered our hospital in May, 1956 (Fig. 5) to be delivered. X-ray film taken two months after delivery showed no change.
that of Schaefer, no patient was found who deteriorated following delivery. In view of this, the question may be raised: Is it still advisable to interrupt pregnancy, for medical reasons, in pulmonary tuberculosis?

Various medical people point to the possibility of exacerbation of the disease as a result of an abortion. In our experience, which is based only on a small number of tuberculosis patients who underwent abortions for social reasons, we also observed definite deterioration in the condition of a woman whose pregnancy had been interrupted.

H.S., 28 years old, was hospitalized because of infiltrative, bilateral, process with cavitation. Following antimicrobial treatment the cavities closed. During the period of hospitalization the patient became pregnant and, due to social reasons, an abortion was done. About a month later, one of the cavities re-opened. It would seem to us that in this case the deterioration in the patient's condition may have been caused by the abortion.

We should not forget that interruption of pregnancy endangers the life of the patient, and may be the cause of future sterility. According to Klintakog, the mortality is 0.6 per cent, and sterility 2.7 per cent. Considering this, and also the fact that the percentage of exacerbation of the disease during pregnancy and delivery is very small, it is our opinion that in the era of modern treatment of tuberculosis there is no justification for surgical interruption of pregnancy in patients suffering from this disease.

Now, as to the health condition of the newborn. It is well known that hereditary tuberculosis is rare. All the patients selected for our survey had given birth to healthy children, free from tuberculosis. The infants received BCG immediately after delivery. As the BCG takes effect only after 6 to 8 weeks, it was necessary to separate the infants from their mothers during this period, and to place them in suitable institutions. Not one infant contracted tuberculosis. The antimicrobial drugs, including streptomycin, given the patients during pregnancy, had no ill effects on the infants, and had caused no complications.

CONCLUSIONS

1. Active pulmonary tuberculosis does not present a reason for interruption of pregnancy.
2. Delivery has no influence on the tuberculous process.
3. Routine fluoroscopy during pregnancy is an effective means for discovering pulmonary tuberculosis.
4. Infants born to mothers suffering from tuberculosis are free from the disease and have regular average weight.
5. Antimicrobial drugs given to tuberculous patients during pregnancy have no ill effects on the newborn and do not cause complications.
6. Close cooperation between the lung specialist and the obstetrician is essential to the treatment of a pregnant woman suffering from tuberculosis.

SUMMARY

This is a report on a follow-up of 55 cases of pregnancy in women with pulmonary tuberculosis who were hospitalized at the Malben Hospital in Beer Yaacov during the years 1952–1957. All received antimicrobial treatment during pregnancy and also after delivery. Only two active cases showed signs of deterioration after delivery. In all other cases there was no change in the tuberculous process after delivery, unless for the better.

In a follow-up of patients subsequent to delivery, no case of exacerbation of the disease was noted and we found no complication in the condition of the mothers or the infants as a result of having received antimicrobial treatment. It is possible to perform lung excisions and other chest operations during pregnancy, without untoward effects.

RESUMEN

Esta es una relación de la observación de 55 casos de mujeres tuberculosas embarazadas ingresadas al Hospital Malben en Beer Yaacov, durante los años de 1952-1957.

Todas recibieron tratamiento antimicrobiano durante el embarazo y después del parto. Sólo dos casos activos mostraron empeoramiento después del parto. En todos los demás no hubo cambio en el padeamiento tuberculoso después del parto y si lo hubo, fue hacia la mejoría.

La observación de los enfermos después del parto, dejó ver que no hubo ningún caso de exacerbación de la enfermedad y no encontramos complicación en las madres o en los niños por haber recibido tratamiento antimicrobiano. Es posible realizar resecciones pulmonares y otras operaciones durante el embarazo sin malos resultados.
RESUMÉ

L'auteur rapporte l'observation complète de 55 cas de grossesse chez des femmes atteintes de tuberculose pulmonaire hospitalisées à l'Hôpital Malben de Beer Yaacov pendant les années 1952 à 1957. Toutes reçurent un traitement antibacillaire pendant la grossesse ainsi qu'après l'accouchement. Deux cas seulement montrèrent des signes d'aggravation après l'accouchement. Dans tous les autres, il n'y eut aucune modification du processus tuberculeux après l'accouchement, si ce n'est une amélioration.

Dans un examen systématique des malades après accouchement, on ne nota aucun cas d'exacerbation de la maladie, et on ne trouva aucune complication dans l'état de santé des mères ou des bébés, provenant de l'administration d'un traitement antibacillaire. Il est possible de pratiquer des exérèses pulmonaires et autres opérations thoraciques pendant la grossesse sans effet nocif.

ZUSAMMENFASSUNG


Bei der Nachuntersuchung von Patienten im Anschluss an die Entbindung wurden keine Fälle Exacerbation der Erkrankung ermittelt, und wir fanden keine Komplikationen im Zustand der Mutter oder des Säuglings als Folge dessen, dass eine antimikrobielle Behandlung vonstatten gegangen war. Es ist möglich, Lungenresektionen und andere Thoraxoperationen während der Schwangerschaft auszuführen-ohne ungünstige Auswirkungen.

REFERENCES

2 Mitchell, R. S.: "Late Results of Modified Bed Rest in Active Uncomplicated Minimal Pulmonary Tuberculosis," Am. Rev. Tuberc. 87:401, 1953.