TUBERCULOSIS AS A COMPLICATION OF PREGNANCY AND PARTURITION,

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There is a superstition prevalent among the laity, and we regret to say, even among a very large number of the medical profession, that pregnancy is beneficial, or at least *not* harmful, to a woman possessed of a *tubercular pulmonary lesion*. This idea arose from the fact that, owing to the increased metabolism of pregnancy, an accumulation of fat is very often observed at such times. In reality,

as we shall see, the strain of child-bearing exhausts the vitality of the tuberculous subject and, in a large percentage of cases, bring about an untimely end.

Bacon has recently shown that pulmonary tuberculosis is found in about the same proportion of pregnant women as of the non-pregnant. Bacon claims that from one to one and a half per cent. of all pregnant women (about 30,000 in the United States) may be said to have a discoverable tubercular lesion, and West states that the disease is more common among married women than among those who remain single.

My purpose in writing this paper is to endeavor to combat anew this old-time superstition and to present again the very serious and baneful effects of pregnancy and parturition upon tuberculous subjects.

It has been my privilege to observe a considerable number of cases of pregnancy complicated by pulmonary tuberculosis, and I have been repeatedly startled with the careless mental attitude of both physician and patient in regard to this subject.

One hundred cases in which tuberculosis existed as a complicating factor during pregnancy have been taken as the basis of this report. They have been collected from the Hospital records and the following is a brief résumé of their salient features.

(1) *Severity.*

(A) In this series, thirty-four per cent. were *mild cases.*

In these cases the degree of the disturbance, caused by the pregnancy, was not great. A moderate aggravation, however, *did* occur in all. The cough became more frequent, the sputum was increased, the temperature was slightly more pronounced and the physical signs somewhat accentuated.

The patients in this class were all discharged from the Hospital on the tenth day of the puerperium, or soon after.

(B) Sixteen per cent. of the cases were chronic in character (the so-called "fibroid phthisis"), which seemed *practically* unaffected by the pregnancy or labor. Unfortunately, it is frequently *so* difficult to follow many of the cases for a long period after their discharge from the Hospital, that we cannot definitely say whether any of this class suffered at a later period from the *secondary effects* of the pregnancy.

(C) In twelve per cent. of the cases the type could be classified as *severe.* All of these patients showed a marked decline during the last trimester of the pregnancy. In them the cough was very troublesome, the sputum abundant, the temperature curve with a general tendency to be high. There was marked loss of flesh and strength (although not particularly noticeable during the first half of pregnancy).

(D) In thirty-eight per cent. of the cases the disease was *far advanced* when the patients first came under our observation. The patients all had the exaggerated loss of flesh and strength, the marked physical signs, the bad cough, and the severe temperature reaction, associated with advanced pulmonary tuberculosis.

(2) *Demonstration of Tubercle Bacilli in the Sputum.*

Tubercle bacilli were demonstrated in the sputum of *all* the *very severe cases,* in eight per cent. of the *severe cases,* and in nineteen out of the *thirty-four mild cases* (*i. e.,* in fifty-six per cent.).

(3) *Types of the Tubercular Involvement.*

In the group of thirty-eight severe cases there were

2 cases of tubercular laryngitis,
7 " " miliary tuberculosis,
2 " " pulmonary edema (with miliary tuberculosis),
27 " " phthisis.

(4) *Course of the Disease.*

Of the *thirty-eight cases of advanced tuberculosis,* all seem to have been distinctly and undeniably aggravated by pregnancy and parturition.

Twenty-nine of this group were only *moderately severe* at the onset, while the remaining nine cases were bad from the beginning of the pregnancy.

In the *moderately severe* and *very severe cases* the time of the *greatest danger* begins in the latter part of pregnancy, and this danger increases steadily through labor and the puerperium.

In the *mild cases* of this series, if any exacerbation occurred in the disease with the development of pregnancy, it took place either early, from the lowered nutrition and exhaustion due to the nausea and vomiting, or late in the pregnancy from increased intra-abdominal pressure and lowering vitality.

(In these mild cases the vitality and nutrition seem often to improve during the middle trimester, but this improvement is usually merely temporary.)

(5) *Deaths in this Series.*

Nineteen cases died as a direct result of the tuberculosis, *i. e.*, nineteen per cent. of the one hundred cases and fifty per cent. of the "very severe" group.

(6) *Time of Death.*

1 case died in the eighth month, undelivered.
2 cases " on labor day.
1 case " " first day post partum.
3 cases " " sixth day
1 case " " seventh day
2 cases " " eighth day
1 case " " twelfth day
1 " " " fifteenth day
1 " " " sixteenth day
1 " " " twenty-second day
1 " " " twenty-fifth day
1 " " " twenty-sixth day
1 " " " twenty-eighth day
1 " " " thirty-sixth day
1 " " " fifty-ninth day

(7) *Number of Still-Births.*

Seven per cent.

(8) *Number of Infant Deaths while in Hospital.*

Thirteen per cent.
(Fifty-five days was the longest any of these infants lived.)

(9) *Prognosis.*

After studying the series of one hundred cases, presented above, as well as from similar data published by others, we ought to realize that, as a general rule, excepting in the very *mild cases,* pregnancy and labor exert a deleterious result upon the patient as well as upon the offspring. The mere fact that nineteen per cent. of these patients died, is perhaps in itself *not* the *most significant fact,* for these cases might not have lived a great while even without the addition of the pregnancy. *The most noteworthy features consist in the marked aggravation of the disease in the presence of pregnancy in such a large percentage of cases, as well as in the undoubted hastening of the end in so many.*

In Senator's Clinic, in Berlin, it was found "that thirty-three out of fifty cases were perniciously influenced by pregnancy, that eight cases were not affected by it, and that in nine cases the result was doubtful.

"Of twenty-three tuberculous women, fourteen died during labor and seven within a few days later."

The early nausea and vomiting interfere with the nutrition; the ever-increasing size of the uterus interferes with the free oxygenation of the blood; but the chief drawback lies in the fact that the pregnant woman is obliged to nourish *two* individuals. Increased anabolism is necessary in the tuberculous non-pregnant individual. When pregnancy occurs—excepting for a possible transitory well-being—the anabolism is insufficient for the extra strain on the system, and the "weakest point" gives way either at once or ultimately.

As shown in our analysis, the lighting up of an old tubercular focus, or the exacerbation of an active process, does not manifest itself markedly, as a rule, until pregnancy has been under way for some time.

We should observe further that even if a woman passes through her pregnancy without a too severe exacerbation, she may go to pieces *during labor* (*vide* Senator's figures), or at any time in the puerperium.

The effects of labor, even though this be not prolonged, are always likely to be serious. The prolonged muscular exertion, the loss of blood, the attendant exhaustion and the use of anæsthesia are always serious.

The cough, the fever and the very frequent accompanying endometritis may cause an abortion or premature labor. Bernheim found that twenty-three per cent. of 315 pregnancies in tubercular subjects were interrupted.

Although our statistics do not closely agree with those of Senator, we believe, from the former as well as from the figures of others, that the time *above all others* when the greatest number of deaths occurs is *in the puerperium*. This is the *great danger period*.

After the temporary stimulus incident upon the presence of the fetus in utero has been removed, katabolism takes place—in some very little, in many very rapidly and excessively.

The most fatal cases are those with "miliary tuberculosis" and those with "laryngeal tuberculosis."

In ninety-seven cases of tuberculosis of the larynx complicating pregnancy, collected by Küttner, ninety died. This type appears early in pregnancy and usually progresses rapidly. Küttner thinks that in pregnancy tracheotomy may improve the prospects in cases that still have a fighting chance.

We cannot accept the view of some that *pregnancy may prove beneficial* to a tubercular subject, excepting in the *rarest instances,* and in the few (authentic) cases reported it is not quite clear to just what extent the patient's environment was responsible for the improvement. Pinard believes this to be possible. Bonney recently reported two such cases, where the pulmonary process became arrested during pregnancy and was not followed by a renewed activity after the completion of the puerperal state. I myself have had one such case (*q. v.* case report no. 8549). All these cases, however, were, in my opinion, largely influenced by superior climatic conditions.

Finally, I desire to reiterate the *fact,* which the majority of clinicians of experience recognize, that the combination of pregnancy, parturition and lactation causes a tremendous tax upon the consumptive, directly lowering her resistance and in many cases hastening her death by many months, perhaps by several years.

ILLUSTRATIVE CASES.

In order to further demonstrate the influence of labor and parturition upon individuals suffering from tuberculosis, brief histories of a few characteristic cases will now be presented, illustrating the important types that are met with in our work:

Case I.—Illustrating mild type of tuberculosis, aggravated by one pregnancy, and apparently arrested during a subsequent one.

Mrs. M.; C. N., 8549; age, 22; para IV. Was admitted to the Hospital October 24, 1906, in the third month of pregnancy. Patient had been treated at intervals for two years for pulmonary tuberculosis. One year previous to admission had had a spontaneous abortion at the second month. She had an old double apical lesion with several old areas in both bases; had been under treatment in the mountains as well as in one of the tubercular clinics in this city and had improved remarkably.

Condition on admission. For the past month her cough had been much aggravated and numerous subcrepitant and crepitant rales were heard over the old areas. Her general condition was fairly good, although not as good as before conception.

She had a retroverted uterus (three months pregnant), which was freely movable.

We decided to empty her uterus. This was done in two sittings, so that only a minimum amount of anæsthesia was used.

Patient recovered rapidly from the effects of the operation. The cough and rales were still present on discharge. A pessary held the uterus in position and the patient was warned *not* to get pregnant again. She went abroad soon after leaving the Hospital, and as she regained her strength the cough gradually left her.

Patient again became pregnant the last of 1907 and has just gone through the entire pregnancy successfully. Her health is better than it has been at any time since the onset of the disease. She was watched carefully, in fairly good surroundings. She did not come under my notice this last time, until well along in pregnancy.

Case II.—Illustrative case of tuberculosis of the larynx and pregnancy.

Mrs. S. L.; G. H., 1544; age, 22; para I. Was brought to the Hospital November 26, 1906. Cough for several months, with rapid loss of flesh and strength. She was eight months pregnant. For the past three weeks had had aphonia, with attacks of dyspnœa at varying intervals. There was painful deglutition. Expectoration contained considerable blood and many tubercle bacilli.

Lungs. Physical examination showed many small tubercular foci scattered through both lungs. Dr. Adams reported tubercular ulceration of larynx. By December 1st patient was breathing with more and more difficulty and was losing ground rapidly. On December 3d, eight days after admission, patient suddenly went into collapse and died from laryngeal obstruction, undelivered. Her temperature ranged throughout between 98 and 99.2°, and pulse was around 130.

Case III.—Example of tubercular pulmonary edema during labor.

Mrs. E. L.; age, 26; para III. First came under our care when in advanced labor. The second stage was short. Temperature,

99.8°; pulse, 94. Immediately after the completion of the third stage patient began to cough violently, became cyanotic, raised much frothy, bloody fluid; breathing was difficult, chest full of moist rales, bronchial breathing left side. Respirations, 48 to the minute; pulse, 120.

The pulmonary edema cleared up under vigorous treatment. After the edema had disappeared crepitant and subcrepitant rales were heard over both chests. Bronchial breathing in many spots. There was typical tubercular history of two years' duration.

Patient improved gradually. The temperature ranged between 100° and 101°, the pulse around 100. She was discharged, against advice, on the fourteenth day after labor. Baby weighed eight pounds and was in good condition.

Case IV.—Example of direct intrauterine transmission.

Mrs. L. A.; C. N., 4918; age, 33; para IV. Entered Hospital December 7, 1904. She was eight months pregnant and was suffering from advanced pulmonary tuberculosis of only six months' duration.

Physical examination. Patient was very weak and emaciated. Impaired resonance all over chest, posteriorly. Bronchial breathing at apices and in different spots in both lungs and many crackling rales heard throughout. Sputum showed an abundance of tubercle bacilli. On December 11th patient delivered herself of a 2100 gram living child. She became rapidly weaker and weaker; the breathing became more difficult; an increased number of rales was heard. The temperature was high, the pulse 140 and poor. Patient died December 17th, on the sixth day after labor.

Autopsy report of baby, which died on nineteenth day after birth: Acute miliary tuberculosis of the lungs, liver, spleen, kidneys and mesentery.

N. B.—This is the only authentic case of *direct transmission* of the disease from parent to fetus, in utero, in the records of this Hospital.

Case V.—Example of death soon after termination of labor.

Mrs. D. D.; C. N., 3351; age, 22; para I; nine months pregnant. Was first brought under our care January 18, 1893, as an emergency case, in advanced labor.

Patient was in desperate condition when first seen by us. She gave a history of acute tuberculosis of not more than six months' duration with hemoptyses for the past two months.

Physical examination revealed large cavities in both lungs. During labor she had several hemoptyses and breathed with the greatest difficulty. Pulse was very rapid and weak. She was in labor only eight hours, but went to pieces immediately after delivery and died two hours later from exhaustion and heart failure.

Baby was born alive—*not* asphyxiated. Discharged in fair condition.

Diagnosis. Acute pulmonary phthisis.

Case VI.—Example of acute delirium and death on fourth day from tuberculosis.

Mrs. R. F.; C. N., 13184; age, 30; para IV. Was brought to the Hospital July 24, 1908. Patient was seven months pregnant and was suffering from advanced pulmonary tuberculosis. She had been suffering from the disease for about one year, with cough, profuse sputum, night sweats, etc., There was great emaciation.

For the last two months prior to admission she had been under treatment in another institution, during which time she had run an irregular temperature between 98.8 and 104 or 105°. She had been growing rapidly worse, and the beginning of her marked downward course started about three months after the onset of this pregnancy.

On admission patient was found to be greatly emaciated and critically ill. Examination of the chest showed many scattered foci throughout both lungs. In the middle lobe of the right lung was a cavity the size of an egg. There was also some consolidation in the right apex. The sputum showed large numbers of tubercle bacilli. Her temperature was 101.4°, and pulse 140 on the day of admission. She was given a nourishing diet and was kept continuously in a quiet place, in the open air, on the roof of the Hospital. She continued about the same until the 29th of July (*i. e.,* for five days), when her mind at times began to wander.

She went into labor July 30th and delivered herself (with the aid of forceps) of an 1800 gram baby.

The day after labor she seemed easier and brighter, but on the

following day she grew delirious and rapidly weaker, the cough became more troublesome and death occurred on the fourth day post partum.

N. B.—The baby died, despite great care, on the twenty-fourth day, from prematurity.

Case VII.—Death in puerperium from miliary tuberculosis.

Mrs. E. R.; C. N., 4732; age, 26; para II. Entered the Hospital October 10, 1904, seven days after a four-months abortion. She was greatly emaciated and very weak, evidently suffering from advanced tuberculosis, with a history of the disease for about two years.

Physical examination. Numerous moist rales throughout both chests with prolonged expiration, friction sounds over both chests and bronchial breathing over both apices. Right lateral scoliosis. Abdomen was rather tense, but boggy; moderate tenderness in lower half. Uterus moderate in size and retroverted. A mass felt on either side of pelvis. Patient died on twelfth day after admission.

Autopsy. Chronic miliary tuberculosis of lungs and omentum, acute miliary tuberculosis of liver, spleen and kidneys. General tuberculous peritonitis with miliary tuberculosis of uterus, tubes and ovaries.

Case VIII.—Acute phthisis developing during pregnancy.

Mrs. M. L.; C. N., 9954; age, 22; para II; eight months pregnant. Was admitted to the Hospital May 15, 1907. Father died of tuberculosis. Present illness began apparently about five months ago with cough, expectoration, loss of weight and strength.

Lungs. Over both bases, posteriorly, was decided dulness; diminished fremitus and marked lessening of respiratory excursion. Chest anteriorly showed bronchial and amphoric breathing; many crackling rales were heard throughout both upper lobes. The patient looked markedly phthisical. There was a severe cough and many tubercle bacilli were found in sputum. She was kept on the roof constantly, in the open air. Supportive treatment was instituted. She went into labor spontaneously, May 25th, and had an easy delivery. Baby weighed 2750 grams, was very feeble and died on the fifth day.

The patient at first seemed none the worse for the labor. By

the second week, however, she began to lose strength again, began to vomit and to have loose stools (abdomen soft). Cough and night sweats became more severe; there was pain in the chest, with apparently rapid breaking down of lung tissue. Despite all treatment death occurred on June 22d (twenty-eight days after labor).

The Relation of Tuberculosis and Marriage.

If we admit, as we must, that tuberculosis is really a great "White Plague;" if we admit that it is a disease whose ravages are enormous; that it is a disease which plays a very large part in the question of depopulation; and if we further recall that these ravages are greatly accentuated by pregnancy and parturition, we will then realize how important the question of marriage is in an individual with tuberculosis, or who has, at some time, suffered from the disease. Osler has so ably and strongly expressed his views on this subject that I will quote him in his summary:

(a) Subjects with healed bone or lymphatic tuberculosis marry with personal impunity and may beget healthy children. It is undeniable, however, that in such families scrofula, caries of the bone, arthritis, cerebral and pulmonary tuberculosis are more common. The risks, however, may be taken.

(b) The question of marriage of a person who has "arrested or cured pulmonary tuberculosis" is more difficult to decide. If a man, the personal risk is not so great; and when the health and strength are good, the external environment favorable and the family history not extremely bad, the experiment—for it is such—is often successful, and many healthy and happy families are begotten under such circumstances.

In women the question is complicated with that of child-bearing, *which increases the risks enormously.* With a localized lesion, absence of hereditary taint, good physique and favorable environment, marriage *might* be permitted. When tuberculosis has existed, however, in a girl whose family history is bad, whose chest expansion is slight and whose physique is below the standard, the physician should, if possible, place his veto upon marriage.

(c) With existing disease, fever, bacilli, etc., marriage should be *absolutely* prohibited. Pregnancy and parturition hasten the process in nearly every case. There is much truth in the remark

of Dubois: "If a woman threatened with phthisis marries, she may bear the first accouchement well; a second, with difficulty, and a third, never."

According to Lawrence Brown, "conception should be forbidden in all cases where the patient has not been well for at *least two years*. The dangers of repeated pregnancies should be explained. The financial condition of the patient is of great importance, and if she must work she must not conceive."

Intermarriage of consumptives, or of those of known predisposition to the disease, should be forbidden *absolutely* and *without compromise,* both on their own account and on account of the great danger of begetting offspring with like pathologic tendencies, or more rarely, with the active disease.

Prof. Pearson recently emphasized a rather unusual feature of the question, namely, "The possible danger from *selective preference* of the tuberculous for each other in their choice for matrimony, with its consequent relation to the propagation of the disease."

If tuberculous subjects, whether married or single, become pregnant they should be placed at once under the best surroundings possible and under the watchful care of a competent physician. If poor, they should be under the care of a good dispensary, or in a hospital. As stated under the general management of these cases, an abortion should be performed, in our opinion, if the case is seen early, during the first trimester.

General Management.

The management resolves itself into

(1) The general medical treatment.
(2) The obstetrical treatment.

The medical treatment resolves itself into practically the same general methods as employed in cases of non-pregnant tubercular females. The difficulties are far greater, unfortunately, and yet these patients are more in need of care and advice, good food, fresh air, etc., than any other class. The difficulties depend upon three essential factors: (a) These patients, being usually married, cannot, excepting with the greatest difficulty, leave home, because of husband or children; (b) being pregnant, it is both risky and

mostly impossible (excepting among the rich) to send them to the country or mountains; (c) being pregnant and tubercular, if poor, they are refused admittance to most "charitable homes," nor are they admitted to most hospitals, until either pregnancy is interrupted prematurely or until labor at term comes on.

The *obstetrical treatment* depends upon the time in pregnancy at which the patient comes under observation. During the *first three or four months artificial abortion* should be resorted to after due care and deliberation, in the majority of cases. It is especially in the mild cases that this operation has its chief value; for if performed early in the pregnancy, the patient can usually readily recuperate from the operation. She must then be warned against renewed pregnancies (excepting when the process has been inactive for one or two years) and should be placed under proper medical supervision. By emptying the uterus in those "mild cases" the patient's health may be restored and life prolonged many years. The husband, too, should be made to realize what conception means, in the presence of tuberculosis.

Again I repeat, these mild cases are the ones, and the only ones, that may offer a bright outlook, after early abortion, and yet it is *in this very type that the greatest laxity exists in the event of pregnancy.*

In the advanced cases, which are seen early, an abortion should likewise be performed, but will probably be of no great value. Early emptying the uterus certainly gives much more satisfactory results than the induction of premature labor, and if done more often our results would be much better than they are.

After the first three or four months, (a) pregnancy should be allowed to *continue* if the patient is holding her own fairly well; (b) if the case was only moderately severe at the beginning of pregnancy and is losing ground, pregnancy should be interrupted; (c) if the case is a bad one, interruption of pregnancy is of no real value; in fact, in the cases losing ground *rapidly* it merely tends to hasten their death.

Labor should always be made as easy as possible, particularly the second stage, which, as a rule, should be assisted with forceps or version. Little anæsthesia should be used, and, when used, is advantageously combined with oxygen.

EFFECTS OF TUBERCULOSIS OF THE PARENT UPON THE OFFSPRING.

Spontaneous interruption of pregnancy is fairly common. Bernheim found that twenty-three per cent. of 315 pregnancies were interrupted. The percentage of still-births and of deaths, in the early days or weeks of extrauterine life, is considerable.

In our series of one hundred cases, seven per cent. were still-births or abortions; thirteen per cent. died while still in the Hospital.

If a child is born alive and does not die at a very early date, there are three great dangers it has to contend with: (1) the inherited tendency to develop the disease; (2) the danger of contracting it from the mother, or perhaps the father; (3) the possibility of direct intrauterine transmission of the disease. This possibility of direct intrauterine infection *does exist,* although it is *rare.*

The writer reported an extremely interesting case of this type in the Bulletin of this Hospital for June, 1905 (C. N., 4918, given above). This baby was born in the thirty-sixth week of pregnancy. It weighed 2100 grams and died on the nineteenth day, having been kept apart from its mother the entire time. There was found, at the autopsy, acute miliary tuberculosis of the lungs, liver, spleen, kidneys and mesentery.

In congenital tuberculosis it is always the mother who is the transmitting agent. Not a single *indisputable* case of direct transmission from the father is on record, even though experiments have proven, beyond a doubt, that the semen may contain tubercle bacilli in advanced general tuberculosis, or severe tuberculosis of the testes.

The infection is transmitted in all cases through the placenta or decidua basalis, from the maternal blood. Although the ovary may be the seat of tuberculosis, it has not been positively demonstrated that direct infection has taken place through an infected ovum.

The placenta shows in all cases tubercular changes; but the degree of infection of the child does not necessarily depend upon the extent of those changes.

Babies at birth should be kept absolutely apart from their mothers, or from any other source of contagion. They should be fed on the milk from a wet-nurse, or on modified milk, and should

never, excepting perhaps in the mildest types of the disease, be allowed to nurse their mothers. Nursing is a great drain on the tuberculous woman; the milk is unsatisfactory for the child, and the association with its mother at such times, as just stated, is not allowable.

"Fille, pas de marriage;
Femme, pas de grossesse;
Mère, pas d'allaitement."

—*Peters (quoted from Lawrence Brown.)*