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# PREGNANCY AND TUBERCULOSIS*

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## PART I—THE EFFECTS OF PREGNANCY ON TUBERCULOSIS

THERE is plenty of scope for discussion, and room for difference of opinion, when a tuberculous woman is found to have become impregnated, as to what can be done and what should be done about it; but there is no difference of opinion as to this, that in most cases, and in the long run, the child-bearing cycle will have a very unfavourable effect on the woman who has pulmonary tuberculosis.

Among the practitioners of an earlier day, chiefly men interested in obstetrics, who perhaps did not follow their patients much beyond the time of delivery, there was an idea that a certain proportion of tuberculous women were actually helped by pregnancy. Perhaps some anæmic or bronchitic, nervous or under-par women, wrongly classed as consumptive, may have been improved, even permanently.

Even tuberculous women may frequently show improvement, usually temporary, during some part of the term of pregnancy. In a recent paper which paints this silver lining a little broader, perhaps, than usual, Dr. J. H. Elliott points out that the pregnant woman, if she eats, digests and assimilates well, has the advantage of utilizing food elements better than her usual, and "A form of hypernutrition, the products of which are intended for the fœtus, can be very useful to the mother who thus derives a certain profit from her greater histogenetic activity." However, in the later months of pregnancy, "A demand for decalcifiation of her own osseous system, the resources of which have already, perhaps, been depleted on account of her tuberculosis . . . . leads to a condition of demineralization unless digestion and assimilation are active."

Elliott's conclusion is not so very different from the dictum of Bacon that *many* tuberculous women do well in the first three months of pregnancy, *fewer* in the second three months, and *very few* in the last three months.

And the termination of pregnancy is by no means the end of danger. The most fateful part of the child-bearing cycle for the tuberculous woman begins with parturition does not end there. Bacon states that one-third of child-bearing women who are actively tuberculous die within a year following labour. Of two hundred child-bearing women treated in the Manitoba Sanatorium, reported upon in 1917, the breakdown to tuberculous disease appeared to have occurred during the nine months of pregnancy in twenty-five per cent., or at the rate of nearly three per cent. per month; in the one month following labour, in twenty-four per cent., or at the rate of twenty-four per cent. per month; during the next twelve months, the period of lactation, in thirty-six per cent., or three per cent. per month; and in the interval between child-birth cycles, in fifteen

*(Part 2, dealing with "The Treatment of Tuberculosis Complicated by Pregnancy," will be published in a later issue.)

per cent., about one per cent. per month. The damage in these cases became apparent in the one month following parturition as often as during the whole nine months of pregnancy, or eight times as often as in any other one month in the cycle; and of break-downs during the cycle, only one-fourth occurred before, and three-fourths after the child had been born.

Pregnancy, then, is a complication, and maternity often a disastrous complication of pulmonary tuberculosis. Funk reports that thirty per cent. of married women, patients in the Phipps Institute at Philadelphia, dated the onset of acute symptoms of tuberculosis to pregnancy or parturition. Davis of Milwaukee quotes Trembly of Saranac as stating that among 250 tuberculous mothers, active disease in 63 per cent. was first discovered after the birth of a child. In 29 per cent. of the tuberculous women observed by Schauta the disease originated or became recognizable during pregnancy or the puerperium. Thirty-seven per cent. in Fishberg's series considered that they had no symptoms of tuberculosis until after one or more childbirths. Jacob and Pannwitz, to quote still farther from data collected by Norris and Landis and also by Davis, found that 25 per cent. of 337 tuberculous women attributed the origin or aggravation of their tuberculosis to pregnancy. Maragliano reported 59 per cent. According to Scarborough 47 per cent. of 200 tuberculous married women in the Iowa State Sanatorium considered that active symptoms first appeared after childbirth. In the Ohio State Sanatorium, Douglas and Harris found among mothers 37 per cent. in whom pregnancy appeared to be the cause of tuberculosis activity. Pregnancy was found according to Norris and Landis to have had a bad influence upon the course of pulmonary tuberculosis, in 75 per cent. of the cases of Lebert, 64 per cent. of those of Deibel, 70 per cent. of Rosthorn's, 73 per cent. of Herman's, 94 per cent. of the patients of Pankow and Kepperle, 77 per cent. of Reiche's and 38 pre cent. of Freud's. Von Bardeleben considered that pregnancy gave an unfavourable turn to tuberculosis in 71 per cent. of his cases and was fatal in 47 per cent. McSweeney and Wang conclude that in some women "pregnancy and labour whip a slightly active tuberculosis into a rapidly advancing and quickly fatal disease."

The saying has been attributed to Dubois and also to Louis that a tuberculous woman may bear the first childbirth well, the second with difficulty, the third not at all. Of the women in the Manitoba Sanatorium series already referred to, the first childbirth seemed to have been the cause of one-fourth of the break-downs, the second of one-fourth, the third of one-fourth and childbirths beyond the third; of the remaining fourth. A miscarriage seemed to have been more damaging than a childbirth. The whole series of tuberculous mothers showed on an average an advance in the progress of their disease about 20 per cent. greater than 1900 other Sanatorium patients.

After all allowances have been made, the conclusion cannot be avoided that child-bearing has a definite place in favoring the progress of tuberculous disease. It can break down resistance, light up anew old pre-maternal lesions and bring about the first sign of breakdown in one who has never before shown evidence of the disease.

This is not strange, but only what might be expected, when the events of the child-bearing cycle are considered in relation to the tuberculous woman. Pregnancy puts an added strain upon the whole nervous organization and on the organs of assimilation and elimination. Nature's arrangement for better assimilation during this period is very often counterbalanced by impaired appetite, nausea and vomiting, though it is said that tuberculous women get off easier than others. Even if metabolism should be bettered the demand is also increased. What vital reserve a tuberculous woman may have, which should be consecrated to the arrest and cure of her disease, is robbed from her by pregnancy. The actual physical burden of a gravid uterus is considerable. The lungs, with other viscera, are pressed upon, perhaps with some benefit to pulmonary disease, but if so, with corresponding harm when the pressure is suddenly removed at parturition. Van Voornveld believes that the sudden re-expansion of a compressed lung after childbirth is the greatest single menace to tuberculosis in the whole cycle, and recommends artificial pneumothorax as almost specific treatment in case of pregnancy in a tuberculous woman.

Parturition with laceration, loss of blood, anæsthesia and changes in pressure involves an amount of shock comparable to that of a laparatomy. Over-strain and violent respiratory efforts are not only most exhausting to an already enfeebled woman but tend also to force infective material from old foci into new lung areas. In autopsies upon women who died of tuberculosis after labour, Hanan found such new areas of infiltration. Van Voornveld considers that a miliary type of tuberculosis may thus be set up which

may simulate and be confused with puerperal sepsis.

Lactation can be avoided, and needless to say, should be; indeed must be; but child care is even more burdensome on that account. The birth of a child into a home doubles work for the mother who is nurse and housekeeper as well, and disturbs rest. Few mothers can make pregnancy and child care their one occupation. For most, these are new burdens which must be added to a load already heavy, sometimes heavier than can be borne.

To believe that such a degree of strain and stress, so great a disarrangement of habit, such interruption of rest, may break down a woman with partly patched up tuberculosis, or, added to other burdens, one with latent disease which has not yet shown open symptoms, it is not necessary to believe that childbirth creates any specific predisposition. The *quantity* of the over-strain, apart from the *kind*, explains the breakdown. If the ordinary routine of an ordinary woman under ordinary conditions has resulted in breakdown to tuberculosis, can the same woman, with the same disease still latent, add to her ordinary burdens the extra strain of pregnancy, childbirth and child care and expect to avoid harm? For the woman who carries the mortgage of a previous tuberculosis, child bearing, which will almost certainly mean expenditure of strength away beyond income, is a very risky speculation. If it is ever to be considered, all resources must be investigated and the whole cost counted.

Should a woman known to be, or to have been actively tuberculous, ever risk maternity? Like most large questions this cannot be answered categorically. Even normal maternity is not altogether without danger, but always means sacrifice, and many women who have been tuberculous will demand motherhood even if their danger and their sacrifice are to be beyond the usual. Where should the line be drawn?

Pregnancy should not be allowed in a woman who has *ever* reached the anatomical far-advanced stage, or *ever* had far-advanced symptoms. By "far-advanced" I do not mean coarse râles, a hollow cheek, and a cavernous cough, but a stage of the disease consistent with very fair appearance, popularly considered as "early" and unfortunately usually described also by many physicians as "early" or "incipient."

Pregnancy should never be allowed in the presence of active symptoms, however slight, or connected with however slight a lesion, and not for years after such a lesion and such symptoms have cleared up.

It should not be allowed until the disease, which has not at any time been severe, has been apparently arrested for at least three years, or still longer if bacilli have ever been found in the sputum.

When may pregnancy in a tuberculous woman, or rather in one with a tuberculous history, be considered?

If, when the disease was active, the lesion was small or moderate in extent; if the course was in every respect favorable, the arrest definite; if there has been freedom from symptoms for from three to five years; if, during that interval, strength and resistance have been well tried out at ordinary work with no evidence of weakening or break-down; if at the same time living conditions are good; if it is possible during practically the whole period of pregnancy and child-care to have, if necessity should arise, release from other burdens, and if there can be experienced, cautious supervision of the mother during the whole period by one who knows the ways of tuberculosis, pregnancy can be allowed in a tuberculous woman with some confidence that it will not lead to a breakdown. But strait is this gate, and narrow this way, and few there be of the women who have ever been tuberculous who can go in thereat.

Women who are or have been tuberculous should be plainly and frankly told of the danger of pregnancy. I have made it a rule to let no woman of child-bearing age, who was definitely tuberculous, whether married or unmarried, go from under my care without such a statement, and have discussed the same matter with the mothers of younger girls. While some with a history of tuberculosis may risk maternity, these are the carefully chosen few, and for the many the old rule holds that the tuberculous woman should not marry, or if married should not become a mother. The dangerous association of maternity and tuberculosis should be more widely known. Indeed, there would be no harm in having people in general realize that while motherhood in a normal woman is a normal function, in a woman weak or ill it is pathological.

# PREGNANCY AND TUBERCULOSIS*

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PART 2.—THE TREATMENT OF TUBERCULOSIS COMPLICATED BY PREGNANCY.

WHEN pregnancy has, through ignorance of the law, or of conditions, or in defiance of them, or on wrong advice, or against advice, actually begun in a woman who is tuberculous, what is to be done about it? Should pregnancy be terminated, and when, and how: or should it not be terminated: and if not, then what can be done? Into these decisions many considerations enter.

Three schools are described by Schauta. One teaches that abortion should be done on every pregnant woman who has tuberculosis; the second that abortion should never be done, but the best of treatment given, and the woman allowed to go through with her pregnancy; the third, that there can be no fixed rule and no general indication, but every case must be considered and decided by itself.

The avoidance of pregnancy is one thing and the interruption of pregnancy quite another. Ordinary human feeling and the religious teaching of many hold the emptying of the uterus and the destruction of the fœtus excusable only when life is to be saved thereby. The law of the land rightly holds the emptying of the uterus for any other reason to be criminal malpractice.

The problem is essentially one of prognosis—judgment as to the probable outcome of the tuberculosis, handicapped by pregnancy and what follows, or, on the other hand, relieved so far as an abortion can relieve it. It is not an obstetrical problem. A wise prognosis in tuberculosis is much more difficult than diagnosis or treatment, and comes only through long experience. The elements which enter into such an estimate can only be briefly indicated. Time is an element in resistance. Long duration is more favourable, other things being equal, than short duration, and quiescence and evidence of arrest are more valuable the longer they have lasted. Small extent of disease, again other things being equal, is much better than greater extent, but not infrequently extensive old chronic disease may give a much better outlook and bear burdens better than a smaller, newer and more active lesion. Activity, even slight, and shown by even the slightest symptoms, always means danger. Complications of any sort are bad, especially when added to pregnancy, which is in itself a bad complication. Pregnancy with laryngitis, or intestinal tuberculosis, even the slightest, gives an outlook almost absolutely bad. In a woman under twenty, pregnancy as a complication to tuberculosis is more serious than in a woman beyond twenty. Out of these and many other elements must be built up an estimate of the possibilities and probabilities of the patient's power of resistance to the disease with a continuance of the pregnancy, or after abortion.

Into the decision must enter practical as well as theoretical considerations. The conditions under which the pregnancy will be passed, the child born and the mother and child live, must be considered. Under the very best conditions it is possible for a child born of a mother actively tuberculous to get a fair start; under average conditions it is most unlikely, and under the worst conditions impossible. How can a mother in a poor home, herself with active disease and in need of care, with other children dragging at her skirts, give anything like a fair start to the latest born whose coming was, from all points of view, a mistake? A consideration of that mistake, how great it is, should enter into the decision for or against release from pregnancy. It is better to sacrifice an unborn fœtus than a mother and a little child.

What chance is there of improvement in the tuberculous condition if pregnancy be terminated? Unfortunately, while an operation can undo the pregnancy, it cannot by any means undo all its

*Part 1, dealing with the effects of Pregnancy on Tuberculosis, was published in January.

evil effects. It cannot make all conditions as though pregnancy had not been. Too often the flare-up of disease due to pregnancy goes on unchecked though the pregnancy be ended. While the second school described by Schauta, teaching that no tuberculous woman should have an abortion, has not prevailed, the present tendency is distinctly toward conservatism, and is so because abortion even if done in the first three months is not infrequently disappointing in its results That it does save life in some cases, however, is undoubted.

To wait and bring about premature labour offers no advantage and many disadvantages. The only wise interference is within the first three months if possible, and on no account later than mid-term. Some recommend not abortion but hysterectomy.

If pregnancy should be allowed to continue in a woman with any tuberculous activity whatsoever, there is one course only to follow. She must "take the cure" of rest and care absolutely, once for her tuberculosis and twice for her pregnancy. Even slight symptoms indicate rest in bed all through pregnancy and for months after the child is born. Almost as strict a routine should be followed by a woman whose uterus has been emptied. For a woman with old tuberculosis now latent much the same routine should be recommended, should pregnancy occur.

In many cases of pregnancy with tuberculosis the decision for or against interference has to be made, and such decisions are always difficult. Men whose opinions should carry weight differ in their teaching, as one leans toward interference and another toward conservatism. But upon this all agree, and this dictum practically all repeat: that no rule can be made, but each case must be considered by itself; and upon this also all agree, that the problem is not obstetrical but medical, a matter first of the most careful estimation of all elements in the prognosis of tuberculosis, and then of constant supervision and control by one wise in the ways of tuberculosis.

Funk of Philadelphia considers that "If the tuberculous lesion is early and active, the pregnancy should be terminated if it has not gone beyond four and a half months." If interference at once is not imperative he would put the patient to bed for a time for close observation. Activity of the tuberculous lesion in spite of this rest should decide for interference. "If the tuberculous lesion is early and inactive, in a patient who gives a previous history of sanatorium care and in whom signs and symptoms are those of an arrested or cured case, the pregnancy should be left alone." If activity appears, he would terminate the pregnancy, but adds: "If the tuberculosis is so acute that the termination of pregnancy would seem immediately necessary the chances are that such a termination will not help an already overwhelming lesion."

Elliott, who is inclined to be conservative, considers that "There are no rules we can follow which will aid us to determine with certainty which cases will bear the added strain of pregnancy well and which badly. It is equally difficult to determine in what cases an abortion will improve the future prospect of the pregnant woman. As in all forms of treatment of tuberculosis, we must individualize; all rules fail. Intervention after the fifth month rarely gives satisfactory results. Prior to the fourth month, it is possible that the mother's future may be improved by emptying the uterus through the modern operation of vaginal hysterectomy."

Van Voornveld, writing in the *Swiss Journal of Surgery*, expresses the common opinion that no general rule can be given, but that the activity of the focus should decide. Holding firmly to the belief that the most damaging feature of the cycle is the sudden re-expansion at delivery, of the diseased lung which has been compressed by pregnancy, he considers artificial pneumothorax a procedure of especial value. In certain cases he would decide upon abortion if lung collapse were not possible, but if the lung could be collapsed by artificial pneumothorax, he would allow pregnancy to continue to term.

Bandolier and Roepke consider that "With manifest active tuberculosis artificial abortion is indicated. The bad effects on the disease will not be thereby always prevented, but the trial must be made." They add that "Artificial induction of premature labour has no advantage whatever over normal confinement. Results of interference are relatively good if the operation is performed early—that is, early in the pregnancy. After five months, induction of labour must as a rule be avoided."

The summing up of C. H. Davis of Milwaukee is a little more unfavourable to interference. There is, he considers, no certain means of determining which patients will be benefitted and which harmed by abortion. He quotes Bacon as considering abortion justifiable in not more than ten per cent. of tuberculous pregnant women; Veit, as reporting no improvement

following abortion in 43 per cent. of the cases collected by him; Trembly, as having had in his large experience so varied results that a general summary was not possible; and Von Bardleben as stating that 50 per cent. of his patients died after abortion.

John Ritter of Chicago puts doubtful cases to bed. If symptoms of tuberculosis subside, the pregnancy is not interrupted. If the symptoms do not subside, interference somewhat improves what is in any case a bad prognosis.

Fishberg's summing up is to the effect that—"Pregnancy is a grave complication of phthisis and in incipient cases it is advisable to induce abortion whenever it occurs."

Douglas and Harris consider that with active tuberculosis therapeutic abortion is indicated when the lesion is early or moderately advanced, or extensive and quiescent, or when complications are present.

Much the same conclusion is reached by Norris and Landis, who think that, "Prior to the fifth month the uterus should be emptied if the disease manifests evidence of becoming active, or if the lesions are extensive or laryngeal involvement occurs." Interruption of the pregnancy, they consider, "does not ensure an amelioration of the pulmonary condition, but does definitely improve the prognosis." They estimate that about 65 to 70 per cent. of patients prior to the fifth month will be definitely improved by the emptying of the uterus as soon as acute symptoms arise, provided proper after-treatment is carried out.

McSweeny's experience has been so varied that he can offer no sure rule. In his series, "Some who were thought to have a poor initial prognosis seemed to progress favourably; others retrograded when it was unexpected. . . . . To answer the question as to the termination of pregnancy in the individual case is extremely difficult, and perhaps the best way is to imagine one's self in the position of the tuberculous woman and then decide."

My own practice has been very conservative, and I do not think I have more than twelve times is as many years advised that pregnancy be interrupted. What little experience I have had, and a study of such statements as have just been quoted, leave me with the opinion that though conservatism is the proper tendency, my own practice has erred in being too conservative; and that interference would have been the better choice in some cases in which I advised against it.

The whole subject of the relation of maternity to tuberculosis is of importance away beyond any general interest or special study so far given it. Bacon estimates that between 24,000 and 36,000 women, with a more or less active tuberculosis, come to child-bed each year in the United States; that more than one per cent. of all pregnant women have tuberculosis active enough and advanced enough for definite diagnosis; and that of all women who die of tuberculosis between twenty and forty, one quarter break down during the child-bearing cycle. Bacon's estimate, if applicable to Canada, would show three thousand pregnancies occurring each year in Canada in women with active tuberculosis.

It is scarcely necessary to point morals which are self-evident.

1.—The occurrence of pregnancy with active tuberculosis even once in one hundred maternity cases establishes this complication as one general practitioners and obstetricians should have definitely in mind. It is perhaps a counsel of perfection to urge a complete chest examination early in every pregnancy (and before every surgical operation also), but even the slightest sign or symptom or suspicion should be considered to merit not a cursory look-over, and a bland assurance of safety, but a thorough examination and investigation. And when during pregnancy or the puerperium symptoms of real illness occur a flare-up of tuberculosis should be one of the first possibilities to occur to the thoughtful physician.

2.—When tuberculosis has been found in a pregnant woman, or pregnancy occurs in one known to be tuberculous, no time should be lost in having the best estimate possible as to the extent and severity of the tuberculosis; in deciding what is best to be done and in getting it under way. The Sanatorium routine is the minimum in such cases.

"Watchful waiting" in such a case is a dangerous motto. The first half of pregnancy will likely go well; it is after mid-term as a rule that trouble begins. But interference is inadvisable after mid-term. So interference must usually be considered and decided for or against, while yet very little trouble has occurred. Forecast, not observation, must rule. The problem is one essentially of prognosis; prognosis of the tuberculous disease, not of the pregnancy.

3.—Bacon has advocated, and McSweeny, on Staten Island, and Dr. Dobbie, at Weston, have organized special hospital sections for the care of tuberculous women, during and after delivery,

and of their infants. In every centre of population such provision should be made.

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