THE AMERICAN

JOURNAL OF OBSTETRICS

AND

DISEASES OF WOMEN AND CHILDREN.

VOL. LXXIII. JUNE, 1916. NO 6.

ORIGINAL COMMUNICATIONS.

PREGNANCY IN THE TUBERCULOUS.

(With the Report of Sixty-eight Cases.)*

BY

CHARLES C. NORRIS, M. D.,

Instructor in Gynecology, University of Pennsylvania, Assistant Gynecologist to the University Hospital, Physician to the Philadelphia Maternity Hospital, Consultant Gynecologist and Obstetrician to the Henry Phipps Institute, Philadelphia, Pa.

In reviewing the early literature of pregnancy in the tuberculous, it is interesting to find that, pregnancy was for many years believed to exert a favorable influence on the course of pulmonary tuberculosis. This is probably due to the fact that gestation tends somewhat to increase the weight of the woman.

Frequency.—Tuberculosis itself is essentially a disease due to faulty hygiene; the latter is the most common among the ignorant and poor, a class in whom fertility is notorious. Although the fertility among the poor is probably largely the result of ignorance regarding the methods of preventing conception, the fact remains that pregnancy and tuberculosis frequently coexist.

Bacon(1) states that 32,000 tuberculous women become pregnant annually in the United States, and that between 44,000 and 48,000 women of the child-bearing age die of tuberculosis every year.

THE PHYSIOLOGY OF PREGNANCY IN ITS BEARING UPON THE COURSE OF TUBERCULOSIS.

The deleterious influence of pregnancy on tuberculous women is well known and many theories have been advanced to explain this

* Read before the Alumni Society of the Sloane Hospital for Women, January 28, 1916.

fact. During pregnancy the woman carries a double burden, and as the gestation advances, the drain upon her strength becomes more and more marked. Although pregnancy is a physiologic process, and one that the healthy woman is well able to bear, when it occurs in a patient whose resisting powers are weakened by disease, the extra stress may be sufficient to overbalance her resistance, and, as a result, the disease may progress rapidly in a woman who had heretofore held her own, or who had even been successfully combating her infection.

This is true of all diseases, but especially is it so of tuberculosis. Many of the physiologic changes that occur as the result of pregnancy, and that are commonly pointed out as the cause for the injurious action of pregnancy hardly appear of sufficient importance during the early stages to account for the rapid progress of the disease frequently observed at this point. The author believes that further study of this subject is required to explain why so many cases of early pregnancy show an exacerbation of the tuberculous condition.

Larynx.—The frequency with which laryngeal involvement occurs in the pregnant tuberculous woman has been commented upon by most observers. Malsbary(2) has suggested that some relationship may exist between this and the so-called "genital spot." Brettauer has called attention to the relationship between the "genital spot" and dysmenorrhea. Hofbauer(3) has demonstrated that, as the result of pregnancy, there is an increased congestion of the larynx, affecting especially the false vocal cords, and that there is also a slight cellular infiltration of the tissue in this location. Hofbauer (*Ibid.*) also states that, in the normal pregnant woman, the mucosa of the larynx becomes reddened and swollen, so that a step from the physiologic to the pathologic is not unlikely.

Puerperium.—Fraught with more danger than pregnancy itself is the puerperium, and here a definite basis of the exacerbation of the tuberculous condition which so frequently occurs at this time can be determined. The patient has already suffered the strain of pregnancy, and has undergone whatever deleterious effects this exerted. The straining and increased blood pressure incident to labor are probably frequently sufficient to break down minute, partially healed pathologic processes, and thus converted closed lesions into open ones. As a result, hitherto partially or entirely encapsulated tubercle bacilli are liberated in more or less large numbers. Many free organisms are thrown into the blood stream, thus accounting for many of

the cases of miliary tuberculosis that have been reported as occurring at this time.

The actual physiologic exhaustion following a difficult labor is also a contributing factor in many cases. The congestion of the lungs incident to labor must likewise be taken into consideration. The prolonged muscular exertion, the physical exhaustion of labor, the possible loss of blood, or the effects of a general anesthetic, if one has been used are also factors that must be considered.

Susceptibility of Pregnant Women to Tuberculosis.—The author believes that, as a general rule, pregnancy, and especially the puerperium exerts an unfavorable influence upon the course of tuberculosis. Whether the normal pregnant woman is more susceptible to infection by the tubercle bacilli is still an open question. It is certain that a definite proportion of women apparently contract the disease during either pregnancy or the puerperium. This is particularly true of the wives of tuberculous men living amid unhygienic surroundings. Whether this is due to an increased susceptibility at this period, or to the added strain on the general system is not known, but both are probably contributing factors.

The change in the general routine of life incident to pregnancy, and the lessened amount of fresh air and lack of exercise indulged in by the pregnant women may to some extent also be causative factors in some cases. Doubtless many cases in which the disease is apparently contracted during pregnancy are in reality exacerbations of hitherto mild and unsuspected lesions, and as the disease progresses clinical symptoms become manifest, with the result that the condition is attributed to an infection occurring during pregnancy. The combined results of eleven observers show that 42 per cent. of their patients first noticed pulmonary symptoms during pregnancy or shortly following it.

The important points in the study of pregnancy in the tuberculous are the prognosis and the treatment. Notwithstanding the frequency of these cases and the amount of study that has been devoted to them, comparatively few valuable statistics have been formulated—too few, in fact, to permit the drawing of any hard or fast rules. The reasons for this are obvious, as so many factors enter into each case—the virulence of the infection, the stage of the disease, the resistance of the patient, her social standing, mode of life, ability, intelligence and willingness to submit to treatment, and the advancement of the pregnancy are all vital factors to be considered. Additional difficulties encountered in the compiling of statistics are that, with reference to the pulmonary conditions, special diagnostic skill is

required and even when this is had the most experienced may vary widely, since the personal equation enters somewhat into these cases.

Condition of the Child.—In considering the prognosis and treatment, a question that immediately arises in the investigator's mind, and in the minds of the prospective parents, is the probable condition of the child. The combined results of fourteen observers show that the average infant mortality in a large series of cases was 58.83 per cent. Armand-Delille(4) studied a series of 787 children born or living in 175 families, one or more members of which were tuberculous. Of these children, 323 were placed in the country and did well; 396 were not removed from their infectious surroundings, and of these 238 developed tuberculosis. From this can be seen the postnatal danger to which the child of a tuberculous mother is exposed.

Doubtless a large proportion of the mortality of the children is the result of death or invalidism of the mother, which often leaves the child without adequate care. Many of the infants of tuberculous mothers are bottle fed even during the mother's life, and the mortality among such children is naturally high. Many authorities believe that the children of a tuberculous mother are constitutional weaklings. In this the author concurs only to a limited extent. The author has seen large, healthy children born from mothers in the last stages of the disease.

Some possible causes for the high infant mortality other than constitutional weakness have already been suggested. It is, however, probable that if a large series of such infants was compared with a series from normal women, that the former would be found smaller and weaker in the average, and this would probably also be the case if a series of infants of anemic or otherwise weakened, but non-tuberculous women were studied. In other words, it does not seem probable that tuberculosis generally exerts any specific action on the infant other than would be produced by any other weakening condition.

INFLUENCE OF PREGNANCY UPON THE COURSE OF PULMONARY TUBERCULOSIS.

Of even more importance than the life of the unborn child is the question of the influence pregnancy will have upon the course of the tuberculosis in the woman. A number of the German authorities argue that, since no one can tell which apparently favorable cases will do well and which will do badly, the correct treatment in all cases of early pregnancy is, therefore, to empty the uterus, and thus

be on the safe side. However, the reverse is also true, although, unfortunately, in a much smaller percentage of cases. Even the test of pregnancy is no certain criterion, as even the cases that do well during this period may suffer severe exacerbations during the puerperium.

Furthermore, apart from an exacerbation of the pulmonary condition, it seems but logical to assume that obstetric complications will develop more frequently in these patients than in normal individuals. In nearly all tuberculous patients, forceps, versions, or some other form of operative delivery is indicated, and this in itself tends to increase the likelihood of sepsis, lacerations, and other complications, and thus to increase the maternal and infant mortality. The anemia and general weakened condition of many of the mothers also constitute a factor in increasing the proportion of dystocia and other obstetric complications.

Lebert(5) found that pregnancy had a bad influence on the course of tuberculosis in 75 per cent. of cases. Deibel(6) found this to occur in 64 per cent. of cases, von Rosthorn,(7) in 70 per cent. von Bardeleben(8) found this to be true in 71 per cent. and states that 47 per cent. of these patients died during pregnancy, labor, or the puerperium. In all von Bardeleben's mild cases there was more or less, sometimes only slight, aggravation of symptoms during pregnancy or the puerperium, and that in most of these cases, the acute symptoms subsided, at least to some extent, in from eight to twelve months. In this series 16 per cent. were presumably closed lesions when the pregnancy occurred, 12 per cent. were severe or acute cases, and all exhibited an aggravation of the disease, especially toward the close of pregnancy. Heiman's collected statistics(9) showed that pulmonary lesions grew worse during pregnancy in 73.4 per cent. Pankow and Kupferle(10) found that 94 per cent. of their cases of active pulmonary lesions grew worse. Reiche(11) observed ill effects in 77 per cent., and Freund in 38 per cent. of cases. Freund(10). Of Lobenstine's(12) ten cases, all grew worse and only four survived labor for three months. Fellner(13) and Schauta(27) found that quiescent or mild chronic cases that had been well for a considerable period prior to pregnancy, suffered a relapse in 68 per cent. of cases.

Pradella's (quoted by Schauta, 27) findings were even less favorable. In a series of 1035 cases he found that 95 per cent. grew worse. Kunreuther(14) also emphasizes the dangers incident to this condition. Marletti(15) found that 50 per cent. grew worse during pregnancy; von Rosthorn,(7) 70 per cent.; Kamina,(16) 50 per cent.; Schauta(27) states that in tuberculous guinea-pigs pregnancy

distinctly shortens the life of the animal. In the author's animal experiences, this was also found to be the case, and especially did this occur in the period following parturition. Schauta(27) quotes the authorities from German sanatoria to the effect that only 25 per cent. of tuberculous women were able to work four years after childbirth, and that all these are by no means cured cases.

Albeck, of Norway(27), found that of sixteen cases, all of which were treated in private sanatoria, and were therefore presumably the recipients of excellent treatment, six died within fifteen months. Essen-Möller(27) reports that death or aggravation occurred in 50 per cent. of his series of sanatorium patients. Schauta (Schauta) (27) states that in at least 75 per cent. of all cases, the disease was aggravated as the result of the pregnancy. Ebeler,(17) from a study of thirty-two cases, recommends the immediate emptying of the uterus unconditionally in every stage of tuberculosis and in any month of pregnancy. Parry(18) reports that in her series of thirty-eight cases, all of which were of the severe type, 50 per cent. died within two months after labor. Fellner(13) observed a general maternal mortality in 9 per cent. Osler quotes Dubois to the effect that, "If a woman threatened with tuberculosis marries, she may bear the first accouchment well; the second with difficulty, and the third never."* Malsbary(2) found the highest mortality among primiparæ.

Bacon(1) estimates that 33 per cent. of tuberculous women who become pregnant die in less than one year following labor. Hoffman(19) found that the greatest mortality among tuberculous women was between the ages of fifteen and forty-five years (195.5 per cent. per 100,000 population), whereas in men the highest mortality was between forty-five and sixty-four years (254 per 1,000,000), indicating that many women die as the result of pregnancy and childbirth. Schlimpert(20) asserts that the greatest number of deaths from tuberculosis during pregnancy occur in childbed (75 per cent.).

In reviewing the foregoing statistics, a number of facts must be taken into consideration. A certain number of cases of pulmonary tuberculosis will exhibit exacerbations even when not pregnant, and this proportion must be deducted from the figures here given when considering the influence of pregnancy upon the course of the disease. On the other hand, statistics compiled from maternity hospitals from which patients are discharged in two or three weeks after labor, no further track being kept of them, are misleading in that no note can thus be made of the exacerbations occurring in the late puer-

*Some authorities attribute this statement to Louis.

perium or during lactation. In this class belong the majority of statistics compiled from English and American hospitals.

Only when the cases are carefully followed for at least six months (some authorities assert for two years or more) can accurate figures be obtained. Owing largely to their registration laws, the opportunities for the German to gather figures is exceptional, and his statistics are especially valuable. In reviewing the literature on this subject, it must also be remembered that in Catholic countries the general feeling against the induction of abortion must be taken into consideration, and doubtless influences the view of many operators.

Laryngeal Tuberculosis.—Practically all authorities recognize the gravity of laryngeal involvement in turberculosis. Fellner,(13) in his series of 289 cases, had a maternal mortality of 44 per cent. Of 231 cases of laryngeal tuberculosis collected from the literature by Lobenstine(12), 200 died during pregnancy, labor, or soon after—a mortality of 86 per cent. In this series of cases spontaneous abortion and premature labor were not infrequent. Raspine(21) emphasizes the ill effects of laryngeal involvement. In the combined mortality statistics from tuberculosis during pregnancy, cases of laryngeal involvement constitute a very definite percentage.

The death-rate among the infants of these patients is about 60 per cent. Imhofer(22) reports a mortality of from 86 to 90 per cent. in those cases in which laryngeal involvement occurs; Küttner,(23) 90 per cent.; Stoechel (*Ibid.*), Lasogna,(24) Pankow and Küpferle,(10) Lubliner,(25) von Sokalowski,(26) and others give practically similar figures.

Nursing.—Tuberculous women should not nurse their children, except in exceptional circumstances, for the mother's sake, and because of the dangers to the child. Tubercle bacilli are occasionally present in the mother's milk. The chief danger of breast feeding to the child is, however, due to accidental contamination, such as occurs from infected fingers carrying tubercle bacilli to the child's mouth, either directly or from infection of the nipples. Kissing and handling of the infant by the mother is a fertile source of infection, and these accidental contaminations are probably much more likely to occur than is a direct transference of the disease by tubercle-bacilli-bearing milk, and probably constitutes the chief danger of nursing.

TREATMENT.

Prophylactic.—Many authorities believe that tuberculous individuals should not marry. Certainly marriage should be advised against

in the presence of any active lesion, no matter how limited in extent. On the other hand, it seems too radical an attitude to forbid the woman with a small, nonactive closed lesion, which has been in abeyance for two or three years, to marry.

We have previously endeavored to emphasize the necessity for individualizing in the case of these patients. Occasionally a case may occur in which the lesion is limited in extent and has been inactive for not less than two years. Under such circumstances, if the patient is intelligent and able to avail herself of proper treatment and supervision, and if she is especially desirous of having a child, conception is probably justifiable. These cases are, however, exceptional, and even under the most favorable circumstances such a patient materially increases the risk of bringing on an exacerbation of her disease. If one or two children are living at the time that the woman becomes infected or seeks advice, conception is best advised against in all cases.

It is impossible to escape the fact that any form of pulmonary tuberculosis, no matter how limited in extent, is especially prone to become aggravated during the pregnancy and the puerperium. Some cases may do well, and, as the result of a limited experience, the physician may easily be led to underestimate the dangers of pregnancy. Unfortunately, despite the most pains-taking study, we are as yet unable to determine with certainty which case will bear pregnancy and the puerperium well, and which will fare badly. No positive prognosis can, therefore, be given in the case of an individual patient. At times, even those cases that appear most favorable will result disastrously, and occasionally, but though unfortunately only in a small proportion of instances, the reverse will be the case. The safest plan for the woman, therefore, is to avoid conception. In these exceptional cases in which conception has been countenanced, strict hygienic measures must be enforced, and the women kept under close observation and examined at frequent intervals by an experienced internist.

TREATMENT OF PREGNANCY AND TUBERCULOSIS.

General Considerations.—As a matter of fact, the physician is frequently not consulted regarding the advisability of either marriage or conception, and often sees the case for the first time after pregnancy has taken place. This is especially true of the ignorant classes, and even the intelligent are as yet not sufficiently educated upon this point. If pregnancy has taken place, the most important point to be decided is, shall the uterus be emptied, and if so, what

are the indications for performing abortion. In cases of early pregnancy the diagnosis of the latter condition is somewhat difficult. Too much attention must not be paid to amenorrhea as a diagnostic sign, as this is not an infrequent symptom in tuberculosis. In our series of 214 cases of tuberculosis in which the menstrual changes were especially studied, total amenorrhea was present in 5 per cent. of cases, and scanty or irregular flow was observed in an additional 53 per cent. of patients.

Schauta (27) states that the opinion of the medical world regarding the treatment of pregnancy in the tuberculous may be divided into three groups: (1) The French school, which admits the unfavorable effect of pregnancy on the course of pulmonary tuberculosis, but declines to induce abortion, and places its hopes for success upon diet, hygiene, etc. (2) The second group, which consists of those who individualize, and who induce abortion if the tuberculosis is advancing, but if it is not, employ general treatment and supervision; and (3) the third group, which considers tuberculosis an unconditional indication for abortion.

The author is not in entire accord with any of these groups, but believes that the attitude toward any given cases must depend upon the conditions surrounding it. In considering the subject, many factors must be taken into consideration, among the most important of which are the advancement of the pregnancy and the character of the pulmonary lesion. The social status of the patient, her intelligence, and whether she is able and willing to observe proper hygienic and dietary precautions, her financial condition, her mental attitude, and the question of whether she already has one or more children are all factors of the utmost importance and should be weighed carefully before determining upon the treatment to be instituted. No hard and fast rule that will be applicable to all cases can, therefore, be laid down.

In the early months of pregnancy, with a rapid advancing pulmonary lesion, there can be no question but that the induction of abortion should be performed without loss of time, and this is also true if laryngeal involvement occurs. On the other hand, given a similar case in the late months of pregnancy, little can be gained by the induction of premature labor.

Speaking on the broadest general lines, the case of pregnancy in the tuberculous may be divided into two groups according to the advancement of the gestation, the first group consisting of those cases seen prior to the fifth month, and the second, those encountered from the fifth month on.

INDICATIONS FOR THE INDUCTION OF AN ABORTION IN THE TUBERCULOUS PRIOR TO THE FIFTH MONTH.

The writer believes that in the presence of an extensive lesion, even in the quiescent stage, or even of small active lesion, the uterus should be emptied at once. This also applies to those cases in which laryngeal involvement of any degree is present. The development of secondary tuberculous lesions in parts of the body other than the lungs is also an indication for this procedure. Excessive vomiting, renal insufficiency, and other complications of pregnancy may, as in the normal woman, constitute indications for emptying the uterus. It must be remembered that the tuberculous woman has smaller resisting powers than the uninfected. Our object is to maintain her powers of resistance to their highest point. In other words, to improve her general health. This is of the utmost importance.

Gastric disturbances or other complications that might be borne by the normal woman may be sufficient to lower the tuberculous patient's resisting powers to such an extent that an exacerbation may occur. For this reason intervention should be employed considerably earlier in the tuberculous woman, and for a milder degree of complications than in the normal woman. Loss of weight is not in itself an indication for the induction of abortion. It is, however, a danger signal of great practical value. Veit(28) lays special stress upon the prognostic value of a loss or gain in weight. Women who lose weight in the latter months of pregnancy often succumb during the puerperium. As a general rule, the earlier the intervention the better is the prognosis.

A much more difficult point to determine is the attitude of the physician toward the patient with the quiescent lesion of moderate or small extent. Here the patient must be studied individually, and the points previously referred to considered. It must be remembered that in every such case the woman runs an added risk by allowing the pregnancy to continue. It is conceded that intervention in the early months of pregnancy is productive of at least moderately good results, but that intervention in the latter months of gestation is of little value. One of the chief dangers, therefore, in these cases is that the patient may do well until about the sixth or the seventh month, when it is too late to do good by emptying the uterus. On the other hand, it is by no means justifiable to advise induction of abortion in every case.

As a general rule, the longer the lesion has been inactive, the better is the prognosis.

Lesions of limited extent and those that have never shown very marked activity are also more favorable. A factor of the utmost importance is whether or not the patient is in a position to obtain proper hygienic and dietary treatment.

Results of Intervention Prior to the Fifth Month.—The combined statistics of twenty-one observers comprising nearly 1000 cases shows that 77 per cent. of women were benefited by emptying the uterus, the percentage varying from 20 to 97 per cent. The diversity of opinion regarding the treatment of this condition is evidence in itself that no ideal plan has as yet been evolved. It will be noticed, however, that the general trend of opinion is toward interruption of pregnancy in the early months of gestation, and toward nonoperative treatment in the second half. The author believes that the wise obstetrician will familiarize himself with the results obtained by others, and carefully consider the source and the methods employed in compiling the statistics; that he will then individualize, and empty the uterus only when it is necessary, and will not allow his natural repugnance to the performance of this operation to influence him to the detriment of his patient.

CONSULTATION AND PRECAUTIONS TO BE ADOPTED PRIOR TO EMPTYING THE UTERUS.

Before deciding to empty the uterus a consultation should always be held. If any doubt exists as to the certainty of the diagnosis of tuberculosis, an experienced internist should be called in. The services of a competent bacteriologist will prove an additional safeguard. The entire procedure should be performed as openly as possible; the family of the patient, and in most cases, the patient herself, should be informed of what is about to be done. No loophole for subsequent criticism should be left. The prognosis should in all cases be guarded, for benefit may not accrue from emptying the uterus, and the family should be so informed, and the true state of affairs explained to them as nearly as possible. With the patient herself a more optimistic view is justifiable.

Choice of Operation.—Prior to the sixth or eighth week, the author has had excellent results from dilatation, and the removal of the products of conception with placental forceps and a dull curette, and packing the uterus with sterile gauze at the completion of the operation. After the eighth week, the ordinary dilatation and curettage has proved an unsatisfactory operation. At this stage of pregnancy, the complete removal of the products of concep-

tion at one sitting, by the ordinary dilatation and curettage is difficult.

There is often considerable hemorrhage, which the patient can ill stand, very frequently it is necessary to repack these cases one or more times, during which period more or less oozing of blood is occurring. A far more satisfactory operation for those cases advanced beyond the second month is vaginal hysterotomy. There is little loss of blood, the uterus can be completely emptied at one sitting, no packing is necessary, there is no subsequent bleeding, and convalescence in my cases has been quiet and uneventful.

TREATMENT OF PATIENTS WITH PREGNANCY ADVANCED BEYOND THE FIFTH MONTH.

As a general rule, this should be expectant, as little benefit can be derived from interference. If the pelvis is at all contracted, or the child seems unusually large, the induction of premature labor, a couple of weeks before the date of confinement is advisable. Every effort which does not materially increase the risks to the child, should be made to give the patient as short and easy a labor as possible. With this end in view, the induction of premature labor a week or two before term is often advisable even in cases in which there is no disproportion in size between the child and the outlet. For the same reason it is rarely advisable to let these patients go beyond term.

The infant should be at once removed from the mother, and should be bottle-fed, and guarded from infection.

The following is the report on sixty-eight cases of pregnancy in tuberculous women: fifty from the Henry Phipps Institute in Philadelphia, and eighteen from obstetric practice. For purposes of study, it has seemed wise to separate these in two groups. The results in the cases from the Phipps Institute are in such marked contradistinction to the second group, and from the results usually obtained, that a short description of the methods employed at that Institution is advisable.

Eighteen months ago, a prenatal clinic was instituted, at the Phipps Institute, for both tuberculous and nontuberculous patients. We get these patients at an average of about the fifth month of pregnancy. Ninety per cent. of them are foreigners, and for the most part poor and ignorant. They are examined by the obstetrician at the prenatal dispensary, and are seen by him at monthly intervals. They are visited by a special social service worker at their homes

at regular intervals, at which times the blood pressure is taken, temperature, pulse and respiration are observed, a specimen for urine analysis is obtained, and the general condition of the patient noted. Close supervision is thus kept, the frequency of the visits depending somewhat upon the individual case. If the patient has no family doctor, arrangements are made for her delivery at a maternity hospital. An important detail of this work is the care after delivery. The patients are again subjected to a pelvic and abdominal examination and the same internist who had been treating them during their pregnancy, again makes a thorough chest examination, and new chest charts, etc. The child is brought at regular intervals to a children's clinic, also an outgrowth of the Phipps Institute, and is there treated, and the mother given whatever advice is necessary. The visits of the social service worker are continued.

It will be seen that not only do these women obtain efficient treatment, but we are also in a position to give accurate data regarding the end results. I have interrupted pregnancy three times in this group of cases, twice with marked benefit, and in the third case the pulmonary condition continued to advance, and the patient died some months later. The following is a summary of cases of pregnancy in the tuberculous from the Henry Phipps Institute. Some of these cases have been followed for eighteen months, whereas, others are not yet delivered.

Fifty cases practically all showed evidences of pulmonary tuberculosis prior to conception (94 per cent.). Many of these women

TABLE I.*

	Cases from the Henry Phipps Institute		Cases from obstetric practice (private and hospital)	
	Number	Percentage	Number	Percentage
Apparently improved	3	6	1	5.55
Not materially worse as result of pregnancy	34	68	4	22.2
Worse as a result of pregnancy	9	18	11	61.11
Deaths	4	8	2	11.11
Total	50		18	

* The average period of observation of these cases has been about nine months. It follows, therefore, that a definite proportion have been followed for a short time. Therefore, if observed two years hence, or even a year after delivery, it is but natural to suppose the percentage of fatal cases would be increased.

have borne a number of children since the onset of their infection, thus, 32 were i-para, 6 were ii-para, 4 were iii-para, 3 were iv-para, and 1 was viii-para. Some of these patients have been under observation at the medical clinics for years, whereas in others, we have had to depend upon the physical findings and upon the history for the estimation of the duration of the tuberculosis. Four are not yet delivered.

Table I showing comparative results in cases from the Henry Phipps Institute, and from those observed in ordinary obstetric practice.

The following is a table showing the number of abortions, miscarriages, and infant deaths:

TABLE II.

	Fifty cases from the Henry Phipps Institute		Eighteen cases from obstetric practice (private and hospital)	
	Number	Percentage	Number	Percentage
Infant deaths	5	10	6	33
Abortions, miscarriages, premature labor (not induced)	2	4	0	0

The results in Table I are very striking, the personal cases following closely the results usually observed. One will naturally ask why in this apparent discrepancy, or in other words, why are the results from Phipps Institute so much better than those in the second group, some of which are private cases, and it would be fair to expect that in these, better treatment would be obtained than in the dispensary patients, no matter how carefully the pre- and postnatal care was conducted. A number of reasons suggest themselves. In the first place, fifty cases is not a large series from which to draw conclusions, especially when the results are so at variance from those usually obtained. Our work at the Phipps Institute is by no means finished, and indeed, this is but a preliminary report; our second or third series of fifty cases may give less favorable results. Second, these cases did obtain not only careful pre- and postnatal care, special care during delivery, and expert medical observations and treatment during their pregnancies and subsequently. Third, early intervention and emptying of the uterus on the slightest definite signs of a pulmonary exacerbation, provided that such occurred prior to the fifth month of pregnancy, and fourth, the majority of

these cases were in the first stage of tuberculosis, and were chronic ambulatory patients prior to conception.

In other words, these patients represented about the ordinary run of pulmonary tuberculosis as observed in the average out-patient department. Whereas in the private cases, the majority showed active lesions. Not infrequently the family physician will care for his tuberculosis patient as long as she is doing well, but will call for consultation as soon as exacerbation occurs; not a few of my personal cases were of this type. These cases naturally help to swell the mortality column. Furthermore, all of the cases from the Phipps Institute were under the care of especially skilled internists, and not only did they obtain skilled treatment, but also the benefits of an early diagnosis. Indeed it seems but fair to assume that some of these cases might not have been correctly diagnosed at all by the obstetrician or the general practitioner. The diagnosis of pulmonary tuberculosis in its early stage is not always easy.

I wish to take this opportunity to express my thanks to the staff of the Phipps Institute for their help and cooperation in the study of these cases, and especially to Dr. H. R. M. Landis. Especial praise is also due to Miss Lucinda N. Stringer, and Miss Margaret Roche, in whose hands the social service work of these cases has fallen. It is largely due to their unfailing efforts that these cases have been followed, and have received as efficient care as they have.

CONCLUSIONS.

I. The combination of pregnancy and pulmonary tuberculosis is a common one.

II. Pulmonary tuberculosis exerts little or no influence against conception.

III. Pulmonary tuberculosis exerts but little influence on the course of pregnancy, and except in the advanced stages exerts little or no influence toward causing abortion, miscarriage, or premature labor.

IV. About 20 per cent. of mild, quiescent pulmonary tuberculosis and 70 per cent. of more advanced cases exhibit exacerbations during pregnancy or the puerperium.

V. Marriage is worse for the tuberculous women than for the tuberculous man owing to the dangers incident to pregnancy.

VI. Unless the pulmonary lesions have been quiescent for a moderately prolonged period, tuberculous women should not marry.

VII. Tuberculous women should not become pregnant unless the

disease is in the first stage, and has been quiescent for a minimum period of two years.

VIII. It is as yet impossible to determine with certainty which case will bear the added strain of pregnancy well and which badly. We must individualize our patients. Moderately extensive lesions, recent activity, the development of secondary lesions, especially laryngeal involvement, loss of weight, fever, hemorrhage, sweats, lack of vigor, inability to obtain proper treatment are ill omens, whereas the reverse are more favorable.

IX. Prior to the fifth month of pregnancy, the uterus should be emptied if the disease manifests any evidence of becoming active. Curettage during the first six or eight weeks, and in the latter cases, vaginal hysterotomy are the preferable methods. Interruption of pregnancy does not insure an amelioration of the pulmonary condition, but does greatly improve the prognosis. About 65 to 70 per cent. of cases, prior to the fifth month of pregnancy, will be definitely improved by emptying of the uterus as soon as acute symptoms arise, provided that proper after-treatment is carried out. Late intervention, that is after a week or more from the onset of the exacerbation has given less satisfactory results. Sterilization is rarely justifiable.

X. After the fifth month of pregnancy, it is generally advisable to treat these patients expectantly. Labor should be made as easy as possible. For this end, induction of premature labor two weeks before term is often advisable, rarely if ever, should they be allowed to go beyond term. At labor forceps or version is usually indicated.

XI. Infants should not nurse tuberculous mothers, and should be especially guarded from infection.

XII. Hygienic and dietary treatment should be employed at all times. These patients should be kept under close observation and should be examined by a competent internist at regular and frequent intervals.

XIII. In the great majority of cases the tuberculosis preceeds the pregnancy. Even in those cases in which the symptoms are first observed during pregnancy, infection has generally occurred prior to conception and an exacerbation during pregnancy has directed attention to the pulmonary condition.

1503 Locust St.

REFERENCES

1. Bacon, C. S. *Jour. Amer. Med. Asso.*, Chicago, 1913, lxi, No. 10, pp. 750–752.

2. Marlsbary, C. E. AMER. JOUR. OBST., N. Y., 1905, lvii, pp. 28–56.
3. Hofbauer. *Zent. f. Gyn.*, Leipz., 1908, xxxii, 429–431.
4. Armand-Delille. AMER. JOUR. OBST., N. Y., 1912, lxvi, p. 664.
5. Lebert. *Thèse de Paris*, 1909.
6. Deibel. *Inaug. Dissertation*, Heidelberg, 1899.
7. von Rosthorn. *A. Kustner's Klein. Lehrb. d. Gyn.*, Jena, 1901, 365–386, Abb. 3.
8. von Bardeleben. *Deutsch. med. Wochenschr.*, 1911, p. 764.
9. Heiman, quoted by Schauta. *Monats. f. Geb. u. Gyn.*, 1911, Bd. 33, H. 3, S. 265.
10. Pankow, O. R. and Kupferle, L. Die Schwangerschafts-unterbrechung bei Lungen und Kehlkopftuberculose, G. Thieme, Leipzig, 1911.
11. Reiche, F. *Munch. med. Wochenschr.*, Sept., 19, 1911.
12. Lobenstein. AMER. JOUR. OBST., N. Y., April, 1913.
13. Fellner, O. O. *Wein. med. Woch.*, 1904, liv, 1157, 1213, 1273.
14. Kunreuther, M. *Berlin. klin. Wochenschr.*, 1914, li, 1628.
15. Marletti. *Arch. ital. di gynec.*, 1904, II, 4.
16. Kamina. *Deutsch. med. Wochenschr.*
17. Ebeler, F. *Prakt. Ergebn. d. Geb. u. Gyn.*, 1914, vi, 87.
18. Parry, A. AMER. JOUR. OBST., N. Y., 1914, No. 1., p. 94.
19. Hoffman. From the Department of Medicine, Jefferson Medical College, Philadelphia., 1914.
20. Schlimpert. *Arch. f. Gyn.*, xc, 121; *Ibid.* 1911, xviv, 863.
21. Raspine. *La Gynecologia*, 1913, x, p. 249.
22. Imhofer, R. *Prag. med. Wochenschr.*, 1914, xxxix, 3.
23. Kuttner, A. *Ann. d. mal. d. l'oreille, du larynx.* Paris, 1907, xxxiii, 445.
24. Lasogna, F. *Arch. ital. di otol.*, Torino, 1914, xxv, 10.
25. Lubliner, L. *Medycina i Kron. lek.*, Warsaw, 1910, xlv, 4890.
26. von Solakowski, A. Ztschr. f. Laryngol., Rhinol. Wurzburg, 1909, II, 575.
27. Schauta, F. *Monatsch. f. Geb. u. Gyn.*, 1911, Bd. xxxiii, H. 3, S. 265.
28. Veit. 75th Versamlungdeutcher Naturforscher. und Artz. in Cassel. *Absilung f. Geb. u. Gyn.*, Sept. 2, 1913.