

VENEREAL DISEASE IN RELATION TO PREGNANCY*

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VENEREAL disease in pregnancy frequently presents a very practical problem to the general practitioner. This paper is written in the hope that it will prove of service and stimulate further interest in one very important phase of venereal disease control. Whereas the paper is essentially a review, a number of suggestions are included for the practical management of venereal disease in pregnancy and the prevention of disease in the newborn. In

view of the present active American campaign against venereal diseases, notably syphilis, a review of the subject of this paper would appear to be definitely in order, more especially as little in this regard has appeared in Canadian literature of the past five years.

It has been only as a result of education and intelligent cooperation of the laity, the organization of special clinics and other facilities for treatment, modern methods of investigation, and improved methods of therapy, that venereal disease now does not possess the same relative prominence it did only a short two or three

* Read before the Section of Preventive Medicine and Hygiene, the Academy of Medicine, Toronto, November 25, 1937.

decades ago. Even within the past few years the medical viewpoint has changed remarkably regarding the advisability of prenatal anti-luetic treatment—former therapy was inadequate (in the light of modern ideas) or was deferred entirely until after childbirth, consequently with a much higher incidence of congenital syphilis.

The association observed between venereal disease and all phases of the reproductive function makes the former a clinical subject of major obstetrical and gynaecological significance. Early investigation, diagnosis and treatment are of extreme importance if a pregnancy is to continue safely and terminate in the birth of a healthy infant. In the light of modern treatment such tragedies as the stillbirth of syphilis, the congenital syphilitic, the blindness of ophthalmia neonatorum, are almost entirely preventable, but their prevention demands un-failing prenatal watchfulness on the part of each physician.

In this paper the discussion will be limited to syphilis and gonorrhœa in relation to pregnancy. Infection producing the chancroid lesion (due to the bacillus of Ducrey) is rarely seen in conjunction with pregnancy. The records of the Special Treatment Clinic during the last six years do not contain a single reference to pregnancy complicated by this type of venereal disease, and this has been a matter in accordance with my own observation elsewhere.

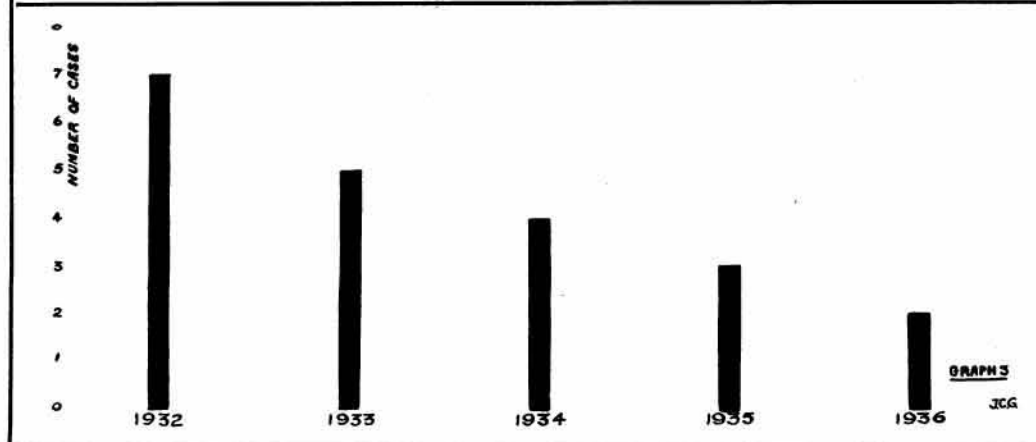
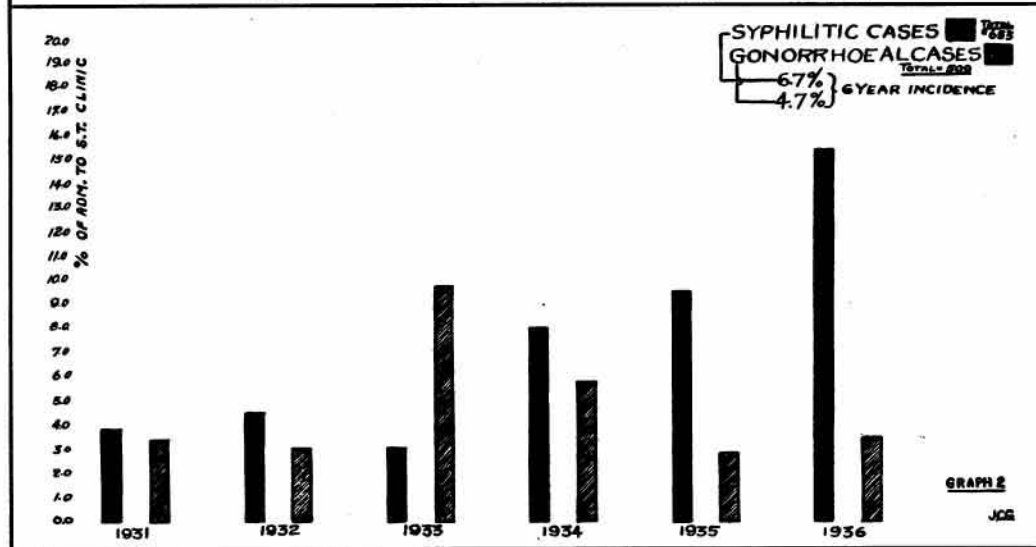
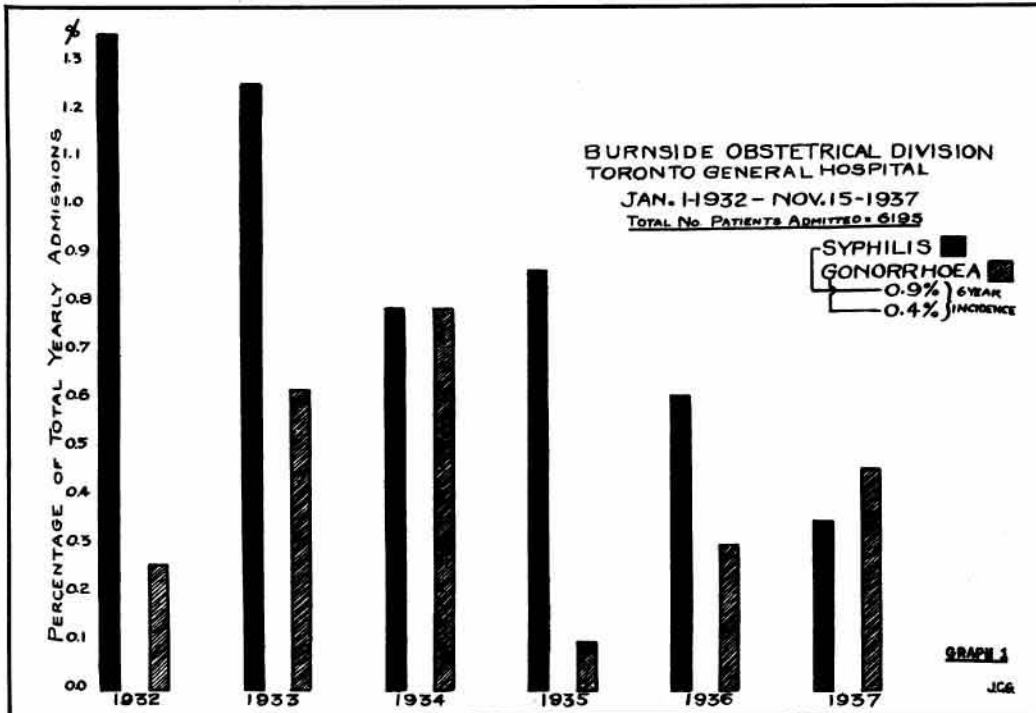
SYPHILIS IN RELATION TO PREGNANCY

According to a calculation by Holland¹ stillbirths due to syphilis approximate 4,000 per year in England and Wales. While such a state of affairs, if we consider it in its world-wide aspect, undoubtedly possesses a certain economic advantage in population control, yet from the purely obstetrical viewpoint it strikes us as a challenge. Surely better methods of control of population exist. Where miscarriages and stillbirths result from syphilis, children with congenital syphilis will also result, and in addition the maiming effects of syphilis may be observed in the parents. The economic disadvantage of thousands of such syphilitic families surely is greater than that of the additional population which would result from the absence of syphilis. Further, one has to face the uncertainty as to where the disease may be found even among

intelligent expectant mothers. Syphilis is most frequently contracted from their husbands, who have come in contact with the multiple existing sources of infection. Were it not for the assistance of routine prenatal Wassermann and Kahn tests, combined with constant clinical watchfulness, the majority of these innocently infected mothers might pass unnoticed, even in spite of stillbirths, until the disease finally became apparent in the birth of a child showing congenital syphilis. The simple prenatal inclusion of the serological test for syphilis is necessary, even though the incidence of syphilis among our Canadian obstetrical patients is low. It will be kept low only by reason of our individual efforts.

The frequency of syphilis in pregnancy.—The frequency of pregnancy complicated by syphilis depends largely upon the class of patients with which one has to deal, and it varies in different parts of the world. A series reported by Ricord² in Paris gives an incidence of 1 syphilitic in 8 pregnant women. McCord³ in 1926 reported incidences of from 7.5 to 22.5 per cent among series of pregnant negro women in the United States. More recent reports among the white population of the United States tend to show a much lower incidence. Based on serological tests the majority of series reported in recent literature give a figure of less than 5 per cent. Plass⁴ states that the percentage of syphilis is greater in multiparæ than in primiparæ. He further points out the tendency toward a lower incidence of syphilis among private patients, and quotes a series with an incidence of approximately 1 per cent positive Wassermann reactions.

The frequency of syphilis among public ward obstetrical patients at the Toronto General Hospital is shown in Graph 1. The average incidence over approximately a six-year period is slightly less than 1 per cent, and it is interesting to note how the rate has dropped since 1932. This also is shown in Table I. At the Special Treatment Clinic of the Toronto General Hospital the incidence of syphilis associated with pregnancy, from 1931 to 1936 inclusive, is shown in Graph 2, with an average six-year incidence of 6.7 per cent. An increase in the proportion of pregnant syphilitic patients is observed in the years 1934 to 1936 inclusive, although Table II shows a decrease in the total number of



Graph 1.—Incidence of syphilis and gonorrhoea in public ward obstetrical cases. Graph 2.—Incidence of venereal disease in association with pregnancy, in out-patients' special treatment clinic, Toronto General Hospital. Graph 3.—Incidence of gonorrhoeal (neonatal) ophthalmia in-patient cases, Hospital for Sick Children, Toronto, January 1, 1932 to December 31, 1936.

patients treated over this period. These patients varied from two to eight months' gestation on admission to the clinic for treatment.

Clinical aspects.—Syphilis tends to be a milder disease in women than in men, with the primary lesion often passing unnoticed according to Plass⁴ and Moore.⁵ The secondary lesions

TABLE I.
INCIDENCE OF VENEREAL DISEASE IN PUBLIC WARD
OBSTETRICAL CASES

Year	Total admissions to Burnside	Syphilitic cases	Gonorrhœal cases
1932	1,170	16	3
1933	1,128	14	7
1934	1,015	8	8
1935	1,037	9	1
1936	985	6	3
1937	860	3	4
Totals	6,195	56	26

TABLE II.
INCIDENCE OF SYPHILIS AND GONORRHOEA ASSOCIATED
WITH PREGNANCY AT OUTPATIENT DEPARTMENT
SPECIAL TREATMENT CLINIC.

Year	Total admissions to clinic	Number of pregnant patients
<i>A. Syphilis</i>		
1931	131	5
1932	133	6
1933	117	4
1934	99	8
1935	95	9
1936	78	12
Totals	653	44
<i>B. Gonorrhœa</i>		
1931	87	3
1932	134	4
1933	91	9
1934	69	4
1935	71	2
1936	57	2
Totals	509	24

may be forgotten or ignored. This mild picture is more frequently the case where syphilis is acquired about the time of conception than where the infection occurs later in the pregnancy.

There is considerable unanimity of opinion that an accurate history of syphilis is almost impossible to obtain in the majority of obstetrical patients. In a moderately large series reported by Nathanson¹² syphilis could not be diagnosed in over 80 per cent of cases on the basis of the history and physical findings alone. The routine Wassermann reaction, confirmed by

the Kahn test to avoid error, stands out as the best diagnostic procedure, and should form an integral part of every prenatal routine. Although McCord⁶ states that pregnancy does not affect the reliability of the Wassermann reaction it is advisable to repeat the test where a positive test is given and also where syphilis is suspected in spite of a negative report.

Syphilis in general does not materially affect labour or the puerperium. Occasionally inertia is observed in labour; lacerations in the birth canal tend to be deeper in the presence of luetic lesions, and often heal slowly. There is an increased tendency toward puerperal sepsis, due to lowered general resistance to bacterial infection, or from secondarily infected genital lesions.

The effect of syphilis upon the fetus.—It is known that the effect of syphilis upon the fetus tends to be mitigated with subsequent pregnancies in the syphilitic mother. Miscarriage due to syphilis is apt to be followed by the birth of a premature macerated fetus, then by stillbirth at or near term, then by a living child with congenital syphilis, and then by later children presenting milder degrees of luetic infection. The transmission of syphilis to the fetus from the mother is always through the placenta; any other mode of infection is extremely improbable and need not be considered here. According to Adair¹¹ the effect of syphilis in producing abortions has been overestimated. It is believed that interference with the nutrition of the embryo by reason of placental syphilitic disease does not occur before the 16th week, as spirochætes have never been demonstrated in either the fetus or placenta of less than 16 to 18 weeks. After this period of intrauterine life, however, maternal syphilis jeopardizes the existence of the fetus with the production of placental syphilis and this is responsible for fetal death *in utero*. The essential feature of the syphilitic placenta is an endarteritis of the vessels of the chorionic villi. This leads to progressive decrease in fetal nutrition. In the case of stillbirth where syphilis is suspected the placenta should be subjected to histological examination for evidence of syphilitic disease. A positive Wassermann reaction, confirmed by the Kahn test, at the present time, according to most authorities, offers reliable evidence as to maternal syphilis, and one may justifiably use it as a diagnostic basis for anti-syphilitic treatment.

Even if the treatment is begun late in pregnancy evidence exists⁴ that the syphilitic placental changes may improve sufficiently to permit the birth of a living child. Eastman¹² states that the placenta stores salvarsan for secondary supply to the fetus according to its needs.

As a general rule it may be said that the child of a syphilitic mother will be syphilitic, although Fildes¹³ states that maternal syphilis does not always mean fetal infection. Conversely, the mother of a syphilitic child is always syphilitic. Surveys show that a small percentage of healthy children may be born of syphilitic mothers, even though the latter be untreated. This remote possibility might occur where the mother became infected late in pregnancy, but there always exists a further possibility that the apparently healthy newborn child might later present evidence of syphilis. Boas and Gammeltoft, quoted by Plass,⁴ state that untreated syphilitic mothers with strongly positive Wassermann reactions give birth to a very high percentage of syphilitic infants (96.5), and this finding is confirmed in the main by other observers. According to McCord⁶ and others the x-ray finding of osteochondritis of the long bones is pathognomonic of congenital syphilis, and almost invariably will be present even in the absence of other clinical evidence of the disease.

Comments as to treatment.—In view of the possibility of latent syphilis it is advisable to give treatment during pregnancy in cases giving a history of antiluetic treatment, even where the Wassermann test is negative, and irrespective of the absence of symptoms. McCord⁶ states that, regardless of the activity of the disease, whether latent or actively progressive, sufficient prenatal anti-syphilitic treatment will assure a woman a syphilis-free child in 95 per cent of the cases. This opinion is confirmed by others such as Nabarro, Harrison, Anwyl-Davies.¹ Cole *et al.*⁷ state that congenital syphilis and other syphilitic manifestations, such as miscarriage and stillbirth, are preventable, but *their prevention is dependent upon early diagnosis by routine prenatal serological tests and adequate early treatment.*

According to a number of observers^{4, 5, 6, 7} the pregnant woman tolerates anti-syphilitic treatment as well as or better than the non-pregnant. Every case should be treated even if discovered

late in pregnancy. Even admittedly inadequate treatment given late in pregnancy has been reported as showing surprisingly beneficial results in the offspring.⁴ Observers have noted that a partial or a single series of an intravenous arsenical has occasionally been followed by a permanently negative Wassermann reaction. Where, under close prenatal supervision, adequate treatment is begun early in pregnancy, in the absence of toxic manifestations due to treatment or other complications of pregnancy, the degree of fetal protection against syphilis is almost absolute. Further, no disturbance of labour or the puerperium has been observed as a direct result of prenatal anti-syphilitic treatment.

The carefully supervised administration of modern arsenical preparations in combination with a heavy metal such as bismuth is regarded by the majority of observers as a safe procedure in pregnancy. Arsenical overdosage in pregnancy, however, has been reported by Cormia⁸ and by Plass and Woods¹⁰ as responsible for hæmorrhagic encephalitis—a serious and usually fatal manifestation clinically resembling eclamptic toxæmia. McKelvey and Turner⁹ however, report 1,000 cases of syphilis in pregnancy treated with moderate dosage of arsenic with no serious toxic disturbance. Plass and Woods¹⁰ stress close observation in giving the first course of treatment in the latter months of pregnancy, because of possible toxic disturbances.

A ROUTINE OF TREATMENT OF SYPHILIS IN PREGNANCY AT THE SPECIAL TREATMENT CLINIC, TORONTO GENERAL HOSPITAL

This plan of treatment follows the Harrison routine, though modified to give a somewhat smaller arsenical dosage over a longer period. Treatment is begun as soon as the disease is diagnosed, and always if possible before the fifth month of pregnancy. Even if the patient does not report until late in pregnancy treatment is given until full term. Treatment is continued to full term even though the Wassermann and Kahn tests become negative. Patients having been treated prior to the advent of pregnancy are subjected to further treatment during pregnancy, regardless of negative Wassermann and Kahn tests. Each patient is treated in collaboration with the prenatal clinic or with her own physician if confinement is to

take place at her own home. She is instructed to return to the clinic following confinement for further observation and treatment. Through the social service department arrangements are made for the children born of these mothers to be investigated, and, where necessary, treated by the Special Treatment Clinic of the Hospital for Sick Children or by their own physician.

I. *The early case.*—By "early" is meant primary, the sero-positive primary, and the secondary luetic case. This group will usually include those cases in which infection occurs at or about the time of conception. The same plan is also followed for the early case appearing any time later in pregnancy. The treatment is as follows—(a) Novarsan (0.45 to 0.6 g. depending on the patient's weight) is injected intravenously; and (b) 2 grains of bismuth oxychloride is injected intramuscularly (hip). This combined dosage is given every 5 days for five treatments. Following this the novarsan and bismuth oxychloride in the same doses are given at weekly intervals for 10 to 12 weeks. Then the novarsan is discontinued and the bismuth oxychloride continued for a further period of 6 weeks. Then the novarsan and the bismuth oxychloride are again resumed for 10 to 12 weeks. Again, as before, the novarsan is discontinued, and the bismuth oxychloride continued, and so on with this alternation until full term is reached, endeavouring if possible to end the prenatal treatment with the arsenical plus bismuth and not with the bismuth alone.

2. *The late case.*—By this is meant the latent, or the tertiary case. Usually the only evidence of latent syphilis is the positive Wassermann and positive Kahn reactions. Essentially the same form of treatment is followed, but at weekly intervals without the initial 5 treatments at five-day intervals. In the tertiary case saturated solution of potassium iodide in 10 minim doses, t.i.d., is given as in the Harrison routine in conjunction with the administration of novarsan and bismuth oxychloride.

Treatment is discontinued (pending further investigation), either temporarily or completely, on the advent of toxic manifestations such as the following: prolonged nausea or persistent vomiting, for more than 24 hours; jaundice; albuminuria, or other evidence of renal damage; dermatitis; pre-eclamptic or eclamptic toxæmia.

For the most part, however, this routine has been well tolerated by pregnant patients and has been associated with no serious toxic complications.

GONORRHOEA IN RELATION TO PREGNANCY

Gonorrhœal infection in pregnancy is a common occurrence, and the incidence, as with syphilitic infection, varies in different areas of the world and in different classes of society. Neisser at one time stated that male and female gonorrhœal infection possessed an incidence only secondary to that of measles. At the present time the relative incidence in proportion to population has shown a distinct decrease as a result of education, venereal disease control measures, and more satisfactory methods of treatment.

The frequency of gonorrhœa in pregnancy.—The frequency of the disease in relation to pregnancy, according to European writers, varies from 1.5 to 50 per cent. American series show a generally lower incidence of infection, averaging from 5 to 10 per cent of pregnant patients. Bernstine and Castallo¹⁴ give an incidence of 7 per cent among outpatients attending the prenatal clinic of the Jefferson Medical College Hospital; and Bernstine¹⁷ gives an incidence in delivered ward cases of 5.4 per cent. Schumann¹⁴ is quoted as being of the opinion that an incidence of 2 per cent is more nearly correct for the present frequency among all classes of society.

The incidence of gonorrhœa among public ward patients of the Burnside Obstetrical Division of the Toronto General Hospital over approximately a six-year period (January 1, 1932 to November 15, 1937) is shown in Graph 1 and Table I, the average incidence being less than 0.4 per cent. In Graph 2 and Table II is shown the frequency of pregnant patients attending the Outpatient Special Treatment Clinic for the treatment of gonorrhœa from 1931 to 1936 (inclusive), an average incidence over a six-year period of 4.7 per cent. The incidence in the Burnside obstetrical series is lower than in other reported series, being slightly under 1 per cent at its maximum for any one year. The proportion of pregnant patients with gonorrhœa attending the Special Treatment Clinic of the Toronto General Hospital is comparable with that of pregnant patients with syphilis, in both

instances the average six-year incidence being about 5 per cent.

Clinical features.—Chronic gonorrhœa may be present in pregnancy with little or no clinical evidence, becoming apparent only with the occurrence of ophthalmia neonatorum or with the post-partum manifestation of acute salpingitis or arthritis. Not infrequently the chronic infection is activated by pregnancy, which state produces a more fertile field for the growth of the gonococcus, due to increase in pelvic vascularity and in glandular secretions. Acute and subacute infections in pregnancy usually present intensified clinical evidence for the same reason. Bernstine¹⁷ has shown that *Trichomonas vaginalis* infestation is not an infrequent associate of the gonococcus. He found that 18 per cent of the patients presenting *Trichomonas vaginalis* infestation in pregnancy also had gonorrhœa. The two conditions thus may be confused. A case clinically diagnosed as gonorrhœa, which shows considerable resistance to treatment, may have *Trichomonas vaginalis* infestation as well, or the clinical picture may be due entirely to the latter.

The chronic case of gonorrhœa presents the greatest potential danger, as it may pass unrecognized. The trivial amount of discharge noticed by the patient is often completely ignored. The patient with the acute disease usually reports to the clinic or to her own physician for treatment, though here again patients have a tendency to explain any vaginal discharge to their own satisfaction. If the condition does not greatly inconvenience them they resort to frequent douching until the discomfort has passed, and then proceed to ignore it. The majority of intelligent women, however, will report a persistent or irritating vaginal discharge, and on learning its cause will cooperate until cured. The greater number of the cases of pregnancy complicated by gonorrhœa coming to the clinic presented evidence of the chronic stage of the disease, the acute form being less common. Patients with infections occurring in the course of pregnancy commonly report the source as their husbands, and not infrequently the latter were supposed to be cured.

The search for evidence of gonorrhœa should be an integral part of every prenatal routine. Occasionally the diagnosis of a chronic case may be difficult, necessitating the examination of several smears. The method of bacteriological

culture of the gonococcus represents a valuable diagnostic aid, and has been constantly employed in this clinic for over a year with a remarkable minimum of error. It is used initially to determine a positive diagnosis, and, when the clinical picture has improved, is also useful as an indication of cure.

The results of gonorrhœal infection in relation to pregnancy.—Gonorrhœal infections in women have far-reaching effects. The disease until recent times has been given credit for the production of approximately 40 per cent of the sterility in women, and has been held responsible for nearly one-half of all gynæcological operations. Marshall¹⁵ states that gonorrhœal ophthalmia accounts for approximately 20 per cent of all blindness observed in state institutions.

The influence of gonorrhœa upon pregnancy, labour, and the puerperium.—Abortion, miscarriage and premature birth are very unlikely complications of gonorrhœa, and, when occurring, are more likely due to ill-advised or carelessly conducted treatment than to the infection itself, even though acute. The only abortion noted in the past six years at the special treatment (gonorrhœal) clinic of the Toronto General Hospital, followed cauterization of the lower cervical canal in a case in which early pregnancy had not been diagnosed.

As a result of the softening influence of frequent baths and the daily warm antiseptic douches advised during treatment of gonorrhœal infection in pregnancy the dilation of the cervix tends to occur more quickly, and the second stage of labour may be shortened. There is always the possibility of puerperal pelvic infection (acute salpingitis) in gonorrhœal cases as a result of upward extension from the cervical focus. This danger is obviously increased if manual or instrumental interference has been associated with delivery. For the same reason third-stage uterine manipulation also should be avoided.¹⁹ The only instance of post-partum gonorrhœal extension to the pelvis in the Burnside obstetrical series (whose incidence has been shown in Graph 1), was a non-clinic case of acute bilateral salpingitis where gonorrhœa was not recognized or treated prenatally. Three-fourths of the cases in this series in which gonorrhœa had been diagnosed prenatally had received treatment either at the special treatment clinic or through their own physicians.

Ophthalmia neonatorum.—May² pointed out that ophthalmia neonatorum, twenty-five years ago, was the cause of 30 per cent of the total blindness; and by 1924 it still could be regarded as the etiological factor in about 10 per cent. The blindness in these cases is theoretically preventable. Notwithstanding the fact that the Credé technique (immediate neonatal instillation of 1 per cent silver nitrate) has been almost generally used in the prophylaxis of ophthalmia neonatorum, various writers, such as Marshall,¹⁵ have pointed out that there has been no appreciable decrease in this serious complication of childbirth in the past fifteen years. This may be due to (1) carelessness in the use of the Credé technique; (2) difficulty in delivery, with excessive or prolonged contact of the child's face against the cervix and lower genital tract; (3) early rupture of the membranes. (In this connection it has been stated that the incidence of ophthalmia is less where the membranes remain intact until just before delivery); and (4) possible infection following delivery.

There is little danger to other obstetrical patients from an unisolated gonorrhœal case where the modern routine postpartum nursing care is followed. One, however, cannot stress too highly the possibility of neonatal eye infection from infected mothers and the danger of spread from one infant with ophthalmia neonatorum to others in the same nursery. In the latter instance absolute isolation is of paramount importance.

DeLee²¹ believes that the proper use of the Credé technique would reduce the incidence of ophthalmia neonatorum below 1 per cent. The small number of ophthalmia neonatorum cases, 21 in all, admitted to the infant ward of the Hospital for Sick Children, Toronto, from 1932 to 1936 inclusive (as shown in Graph 3), would tend to show that this condition is decreasing in frequency—the hospital admission rate being fairly constant over this period. Marshall¹⁵ states that where gonorrhœa in the mother is treated prenatally, ophthalmia neonatorum may be reduced to one-fifth of that seen in a series where no treatment is given prior to delivery. Bernstine and Castallo¹⁴ present 84 treated gonorrhœal cases in a series of 3,586 obstetrical patients with no ophthalmia neonatorum. There were in this same series of obstetrical patients 15 cases of ophthalmia neonatorum which occurred where the mother's disease had not been

recognized or treated, and, further, in spite of routine Credé prophylaxis. Prenatal gonorrhœal treatment for this reason is a very important factor in the prevention of ophthalmia neonatorum.

Carefully conducted prenatal treatment, even if a cure does not result by the time of delivery, in all likelihood will sufficiently mitigate the infection to render Credé prophylaxis effective. Further, it will reduce the danger of the postpartum spread of gonorrhœal infection to the pelvis and will aid in making the disease more amenable to later treatment. Among 26 Burnside obstetrical patients (Table I), whose prenatal condition was complicated by gonorrhœa, 2 cases of ophthalmia neonatorum occurred. In both instances the mother's disease had not been recognized or treated. Thus in 24 out of the 26 cases the Credé technique was an important factor in the prevention of ophthalmia, though approximately 75 per cent of these patients were treated for gonorrhœa by the Special Treatment Clinic or by their own physicians.

ROUTINE OF PRENATAL TREATMENT OF GONORRHOEA, SPECIAL TREATMENT CLINIC, TORONTO GENERAL HOSPITAL

All patients on admission and on discharge from this clinic are subjected to Wassermann and Kahn tests because of the possibility of associated syphilis. The diagnosis of gonorrhœa is confirmed by bacteriological culture, swabs being taken from the urethra and cervix. The husband of an infected patient, whether he is infected or not, is kept under treatment or observation until both patient and husband are free from infection. Likewise, the non-infected pregnant patient is kept under observation as a possible contact if the husband is infected until the latter is cured. Sexual intercourse is prohibited until both patient and husband are free from infection. Alcohol and highly seasoned foods are not allowed. Fluids are forced throughout the period of treatment. This plan of treatment is followed progressively through each stage of the disease; and the patient on admission to clinic is placed on that part of the routine applicable to the stage of her disease.

Acute.—Rest in bed for 7 to 10 days. Urinary sedative if dysuria exists. The external genitalia are kept as free from discharge as possible by use of 1:4,000 potassium permanganate solution, either poured over the parts or used in a sitz bath, three or four times daily for 7 to 10 days. No douche or local treatment is given in this stage.

Subacute.—If the patient is within 2 months of term visits are to be twice weekly; otherwise once a week. This stage of the disease usually requires 4 to 5 weeks of treatment. Restrict activity to a minimum. *Urethral treatment.*—Given each visit. A small narrow absorbent cotton tampon is folded over a ball-pointed probe. The tampon is then saturated with 50 per cent silvol and inserted into the urethra, leaving about one-fifth of it protruding from the orifice. The patient is instructed to leave in the tampon for four hours if possible. The act of voiding will expel the tampon. *Cervical treatment.*—On each visit to the clinic the cervix and vagina are thoroughly dried; and then gently swabbed with a 1:500 metaphen solution. The patient is instructed to take a 1:4,000 potassium permanganate douche twice daily at low pressure and body temperature; the douche to be taken with the patient lying down over a douche or bed pan. She is instructed as to the sterilization of her douche equipment.

Chronic.—Visits to the clinic are to be at intervals of two weeks if the patient reports within the first five months of pregnancy; and weekly if the first visit is after the fifth month. Continue treatment until term. If smears and culture become negative, visits can be extended to intervals of two to three weeks. Ordinary activity, but no fatigue, is permitted. Urethral treatment, on each visit, as described above. Cervical treatment, on each visit, as described above; 1:4,000 potassium permanganate douche once daily. *N.B.*—Electrocauterization, diathermy, or any intracervical treatment is not used at any stage of the pregnancy. Sulphanilamide is not given prenatally, because of possible toxic effects.

Post-partum.—Every patient is instructed to return to the clinic at the 6th week post-partum for further treatment if smears or cultures are still positive; and for three months further observation if negative. She is discharged as cured following three months' post-partum observation, if monthly cultures are reported negative. These cultures are taken as nearly as possible following the conclusion of each menstrual period, or once a month if the patient is not menstruating.

CONCLUSIONS

1. The incidence of syphilis in pregnancy would appear to be decreasing as a result of education of the public, venereal disease control measures, adequate facilities for, and improved methods of, treatment.

2. Wassermann and Kahn tests should form an integral part of every prenatal routine.

3. As a general rule the clinical manifestations of syphilis are less marked in the pregnant than in the non-pregnant woman.

4. The pregnant patient tolerates anti-syphilitic treatment as well or better than the non-pregnant, and every syphilitic pregnant patient

should be treated, unless a serious contraindication to treatment exists.

5. Anti-syphilitic treatment is safe essentially, providing arsenical dosage is moderate and the patient kept under close observation for evidence of toxic manifestations.

6. Congenital syphilis and other evidence of fetal-placental syphilis is theoretically completely preventable, providing early adequate prenatal treatment is given.

7. An outline of the routine plan of prenatal anti-syphilitic treatment, as followed by the Special Treatment Clinic of the Toronto General Hospital, is included.

8. The incidence of gonorrhœa in pregnancy appears to be declining for the same reasons as stated in regard to syphilis.

9. The clinical and bacteriological search for evidence of gonorrhœal infection should form part of every prenatal routine.

10. Adequate prenatal treatment of gonorrhœa practically eliminates any danger of post-partum maternal gonorrhœal complications.

11. Adequate prenatal treatment of gonorrhœa combined with the immediate neonatal use of the Credé prophylactic technique will give the infant almost absolute protection against ophthalmia neonatorum.

12. The routine plan of prenatal treatment of gonorrhœa, as followed by the Special Treatment Clinic of the Toronto General Hospital, is included.

The writer is indebted to Dr. Noble Black, of the Special Treatment Clinic Staff, Toronto General Hospital, for the outline of the prenatal treatment of syphilis in pregnancy, as included in this paper.

The assistance of Miss Phyllis Denne, of the Social Service Department, Toronto General Hospital, in regard to the statistical data presented, is much appreciated.

The writer is also indebted to Dr. W. W. Wright for permission to include data as to the incidence of in-patient cases of ophthalmia neonatorum at the Hospital for Sick Children, Toronto.

The complete references for this paper can be obtained on application to the author. The small figures in the text refer to these.