Post-Graduate Medical Journal

LONDON, JULY 1944

VENEREAL DISEASE IN RELATION TO PREGNANCY

By W. NEVILLE MASCALL, M.A.(Cantab.), M.R.C.S.(Eng.), L.R.C.P.(London)

(Acting Director, L.C.C. (Whitechapel) Clinic. Acting Consultant Venereologist to the L.C.C.)

It is indeed a tragedy when a woman contracts venereal disease, but it becomes a double tragedy when she becomes pregnant whilst suffering from the disease, as there are then two individuals involved—the mother and her unborn babe. It should, however, be stressed from the outset that venereal diseases are curable, and their effects upon the offspring avoided provided that the conditions are recognised early enough in pregnancy and that once they are recognised suitable treatment is commenced. The willing co-operation of the patient is essential to success. When, therefore, discussing pregnancy associated with venereal disease, the subject must at the same time of necessity include the prevention of the transmission of the disease to the child. A case of pre-natal syphilis or gonorrhoeal ophthalmia must be considered as a serious breakdown in the mechanism of preventive medicine, and casts a definite slur on those in charge of the case. Both pre-natal syphilis and gonococcal ophthalmia are preventable diseases, provided that there is thorough ante-natal supervision and co-operation.

At the present time there are five recognised venereal diseases in the British Isles, namely: (1) *Syphilis*; (2) *Gonorrhoea*; (3) *Soft Chancre*; (4) *Granuloma Inguinale*; (5) *Lymphogranuloma Inguinale*. An attempt will be made in this paper to point out how these conditions may be detected, how they affect pregnancy, and how they are affected by pregnancy. It should be stated that syphilis and gonorrhoea will be the main topics of discussion, because these two are transmissible and are capable of affecting the future generation.

Origin of Infection.

There is no doubt whatever that the majority of women infected with venereal disease are married women. The majority of these women are infected by their husbands, who are either infected prior to marriage and inadequately treated, or who become infected after marriage through illicit intercourse.

FOURNIER found that 67 per cent of 208 women were infected by men who had acquired the disease prior to marriage. He also showed that 75 per cent of his syphilitic married women patients acquired the disease from their husbands. The SOLOMONS estimated that 80 to 90 per cent of their husbands acquired syphilis before marriage.

At the WHITECHAPEL CLINIC analysis of one hundred consecutive cases gave the following results:

Married	..	..	..	..	..	59 per cent
Single	..	..	..	..	..	41 per cent
Pregnant	..	..	..	..	..	13 per cent

The 59 married women, as far as could be ascertained, had all been infected by their husbands. Of these one hundred cases, 19 per cent were suffering from syphilis and 41 per cent were suffering from gonorrhoea.

It is highly probable that a large proportion of these infections could be avoided by a compulsory pre-marital medical examination, such as is now demanded in some of the Dominions and several other countries in the world.

SYPHILIS

Detection.

Undoubtedly, the most certain way of detecting syphilis in a pregnant woman is by the use of routine ante-natal serological tests. These tests should be carried out on all patients, irrespective of social status, remembering that there are no class distinctions in relation to venereal disease. The ideal would be to take serological tests at the second month, fifth month, and a final one at the eighth month.

The theory that pregnant women are liable to give false positive serological reactions has now been exploded. This theory arose from the fact that a large percentage of pregnant women unfortunately gave negative serological reactions and yet gave birth to a large proportion of syphilitic infants. These sero-negative syphilitic pregnant women create one of the most difficult problems which face the medical attendant. Regarding the causation of this apparent false reaction, BURKE puts forward the following theory:

"The chief characteristics of the physical and chemical constitution of protozoa is that they are rich in lipoids and that they have an affinity for tissues of a like nature. This is especially so in respect of the *Treponema pallidum*. It is a lipid-rich assailant of lipid-rich tissues. When it attacks such tissues lipo-proteins are formed which are set free into the circulation. These stimulate the production of lipo-proteolytic ferments—antibodies or amboceptors—which become bound to lipid-rich tissue and which exercise a lytic action upon protozoal organisms. They have both a combinative-tissue action and a lytic-organismal action. These ferments, which are simply antibodies for lipoids, again attack fresh lipid-rich organisms and tissues, more lipo-proteins and ferments are produced, and so the process goes on. Although the ferments are antibodies, they are not absolutely specific for any particular type of protozoan parasites. Their specificity or power increases directly with the lipid content of the parasite. In a like manner their affinity for body tissue varies directly with the lipid-richness of that tissue. Furthermore the higher the lipid content of the parasite infected, the more severe will be the attack upon the lipid-tissue and the greater the production of ferment.

In a protozoal complement fixation test, such as the Wassermann, we are concerned primarily not with the parasites but with their essential and characteristic lipoids. If then a patient has syphilis—or more accurately, if his, or her, syphilis is such that there has occurred a sufficient destruction of lipid-rich tissue—his, or her, serum will contain enough lipo-proteolytic ferment or reagin to give a positive result when tested by the Wassermann reaction.

Why is it, then, that women who have syphilis, and especially when they are pregnant, so frequently show a negative serology? Either they do not produce sufficient ferment to give a positive result, or that, although the production of the antibody is adequate, it does not reach the serum in sufficient quantity to be detected.

The general rule, then, is that the higher the lipid content of the patient, the greater the amount of ferment produced, but the less of it will there be free in the serum. So it is that during pregnancy, when the bodily lipid-richness is markedly increased, there is a still greater tendency for the Wassermann to be negative."

The fact of this suppression, which is expressed in the small number of positive reactions found in ante-natal clinics, has led some misguided people to decry the use of routine blood tests. Dr. Nabarro concluded from his investigations of routine Wassermann Reactions in ante-natal clinics that the number of positive reactions varied from 0.46 to 2.79 per cent. He judged that the figure for the whole country was from 1 to 2 per cent. Some people argue that the results do not justify the outlay. I am, however, of the firm conviction that if only one child is saved from the ravages of pre-natal syphilis, the trouble is worth while. The following are the figures given by the Ministry of Health for new cases of congenital syphilis:

1940	..	..	..	..	1,358
1941	..	..	..	..	1,380
1942	..	..	..	..	1,464

In all probability to-day this figure is increasing.

If there is any doubt either about a negative or positive reaction the test should be repeated. If it is returned persistently positive, commence treatment at once; if persistently negative, further search is essential. Delve deeply into the patient's past history, also that of her husband. Enquiry may reveal that the patient has had syphilis, which has either not been treated or treated ineffectually, insomuch as that it has caused reversal of the serological reactions, but is insufficient to prevent transmission to the child. A history of sores, rashes and persistent sore throats is definitely suspicious. Palpation of the patient's buttocks may reveal unabsorbed patches of bismuth. Fortunately, the number of these sero-negative cases is being

substantially reduced by the increased sensitivity of the modern serological reactions. It is essential that every pregnant woman should be subjected to a thorough clinical examination. First of all palpate the inguinal glands. In syphilis these glands are painlessly enlarged, are discrete and of a rubbery consistency. Inspect the vulva, vagina and cervix for any suspicious sore. The lesions likely to be found are of two forms.

(1) **The primary lesion: the chancre.**—This sore usually appears about twenty-one days after infection has taken place. The commonest sites of the primary chancre in order are: the labia, the urethral orifice, the clitoris, the fourchette, and the cervix. The true characteristic, punched-out, indurated single sore is not frequently seen. In the very early stages it may appear as a simple minute abrasion, which looks as though the surface of the epithelium has been rubbed off. These sores are usually non-painful. Contact sores may occur. Unfortunately the primary sore is apt to be overlooked. It causes no discomfort to the patient, and is often situated where it is not readily apparent.

(2) **The secondary lesion: condylomata lata.**—These are the commonest lesions seen in the female and are modifications of the primary sore owing to the moisture of their situation. They are non-pedunculated condylomata which may occur either discreetly or in bunches. They may be spread all over the vulva, perineum and anus, and on to the thighs and vaginal wall.

Examine the skin for a rash. This is usually of a polymorphous character, and it is most pronounced on the flexor surfaces, or where pressure from body-belts or corsets occurs. Watch the forehead.

In all cases the throat should be examined as in the early stages of the disease there is usually some infection of the fauces. In the secondary stage ulceration may occur upon the fauces and tonsils: this ulceration has a characteristic snail-track appearance. Scarring of the palate or absence of the uvula may be evidence of previous disease.

Any suspicious lesion should be investigated as follows. The lesion should be cleaned with a swab soaked in saline. It should then be rubbed with a dry swab until it is caused to weep, avoiding making it bleed if possible. Then squeeze the base of the lesion to try to make it exude serum. Healed lesions may have to be scarified. Collect the serum on a coverslip and transfer this on to a microscopic slide on which is placed a drop of saline, and subject this to microscopical examination, using darkground illumination, for the *T. pallidum*. Familiarity with this method is essential. *T. pallidum* may be found in the skin lesions and throat if treated in a similar way.

Sores may have been treated with ointment, or are too far healed to produce any serum; then attention should be directed at the inguinal glands. Select a prominent enlarged gland and cleanse the skin over it with spirit. Transfix the gland between the thumb and finger and pierce it with a hypodermic needle to which a syringe containing a few drops of sterile saline is attached. Force the saline into the gland, then withdraw it. Subject the withdrawn fluid to darkground examination.

(3) **Tertiary lesions.**—The tertiary lesions of syphilis affect the skin and central nervous system. The cutaneous lesions or gummata occur on the skin, usually over bony sites, namely, the shins, the arms, the shoulders, the forehead and nose. These gumma begin as painless, intra- or subcutaneous nodules, which have a characteristic elastic rubbery induration. The skin over these indurations breaks down and a deep, sloughing, punched-out ulcer results. The base of the ulcer is usually dirty and covered with a wash-leather-like slough. Although occasionally single, these ulcers are usually multiple, when they are apt to coalesce, forming a large ulcer with a circinate margin. When healed these ulcers leave a characteristic parchment-like scar. Characteristic signs in the central nervous systems are:

- (1) Argyll-Robertson pupils: loss of reaction to light, but not to accommodation.
- (2) Exaggerated or absent ankle jerks. These usually alter before the knee reflexes.
- (3) Exaggerated or absent knee jerks.
- (4) Flexor response to Babinski's sign. The big toe becomes flexed on stroking the sole of the foot.
- (5) Positive Romberg's sign. This is demonstrated by making the patient stand with the feet close together and then close her eyes. A swaying, or tendency to fall, is a positive reaction.

The diagnosis is helped by performing a lumbar puncture and examining the cerebro-spinal fluid. A positive Wassermann Reaction with or without a *paretic* (55554332100) or *tabetic*

(01234432100), Lange Colloidal Gold test curve, is definite evidence of involvement of the central nervous system. Attention should also be taken of the globulin content and differential cell count. The normal cell count ranges from nought to three. The cells predominating in neuro-syphilis are lymphocytes. A count of five to ten cells should be taken as definite evidence of meningeal involvement and if ten or over it is of grave significance as regards prognosis. Increase in the amount of globulin in the cerebro-spinal fluid occurs in practically every case of neurosyphilis and, although suspicious, it is not diagnostic of the condition as it occurs in other organic affections of the central nervous system.

With regard to lumbar puncture during pregnancy, as a general rule this should be avoided unless absolutely essential. It seems hardly fair to submit the patient, already considerably inconvenienced, to any further unnecessary discomfort and the risk of severe headaches. Really all treatment during pregnancy is directed at saving the child from infection, and the knowledge gained from a lumbar puncture will not help at all. If the patient is known to have syphilis after she has been delivered and whilst still in bed just before discharge from hospital, it should be done as it may influence her future treatment.

Having convinced one's self that the patient has syphilis, treatment should be commenced at once.

It was estimated in the U.S.A. in 1940 that approximately one million of the potential mothers of that country had syphilis, and these studies have shown that in a group of women who had never received antisyphilitic treatment, only 17 per cent of the known conceptions resulted in living non-syphilitic children. The remaining 83 per cent terminated in miscarriages, still-births or living children with syphilis.

The Effect of Syphilis on Pregnancy

It has been shown by Stokes that a syphilitic woman who remains untreated, or is improperly treated, has only one chance in six of bearing a live, healthy child, as compared with the normal woman's three chances in four.

The usual history regarding pregnancies of an untreated syphilitic woman is one of premature births, rather than abortions; miscarriages alternate with stillbirths and with living children.

The pathology of this seems somewhat obscure; it has been suggested that when the parasite enters the fertilised ovum, either at conception or after conception, by way of the maternal blood stream, a perivascular infiltration of the ovum by lymphocytes and plasma cells occurs. What follows depends on the intensity of the reaction and the time of the infection. If the reaction is early and severe, abortion takes place. When the infection is delayed, or the reaction not so severe, death of the foetus *in utero* may occur. If further delay occurs, a living child, heavily infected, may survive death for a short while, until finally a child is born which does survive, even though ravaged with disease.

KASSOWITZ law states that the probability that the child will be infected *in utero* diminishes to some extent as the years after the mother's infection pass by. It is not, however, safe to work on this law without very careful consideration of the pros and cons. Recent research on premature infants born before the fifth month of pregnancy has shown that in all probability infection of the foetus *in utero* does not occur until about the fifth month. It is believed that infection is carried *via* the maternal blood stream. Waves of spirochetemia occur, until finally one of these waves is large enough to force the protective barrier set up by the placenta.

It can, however, be taken as a working rule that if the mother contracts syphilis shortly before, at the time of or just after conception, the result will be that the foetus-in-utero will be infected if the infection takes place any time during pregnancy, unless it occurs just before delivery. Colles's Law believed that the apparently healthy mother of a syphilitic child probably escaped infection herself by acquiring some form of immunity during pregnancy, and that she could nurse her child without danger of infection. This has now been disproved.

BROWN and PEARCE have shown very clearly that the reaction of the rabbit to inoculation with *T. pallida*, when it coincides with conception, differs very considerably from that of the normal animal inoculated in the same manner, and that this difference extends throughout the period of pregnancy and during most of the period of lactation. The differences were of two kinds: ordinarily it appeared that the defensive mechanism of the pregnant animal was capable of opposing a resistance to inoculations performed at the time of conception in that little, or

no, signs of infection appeared. In the other instances, however, slight local reaction and marked constitutional disturbances were produced, which suggested an ineffectual resistance to the infection or a breaking down of the defensive mechanism.

Profeta's law considered that the apparently healthy child of a syphilitic mother also acquired an immunity, and that there was little or no danger of it contracting syphilis. It is, however, well known that the mother first, and the child secondarily, can be infected with syphilis in a marked degree of latency.

KOLMER states: I cannot believe that it is generally possible for a woman to give birth to a syphilitic child and escape infection, and I believe that she is a fit subject for treatment. Her disease is latent and may remain so for many years, but tertiary lesions are apt finally to develop. Whether the child of a syphilitic woman is always syphilitic is much less certain. Certainly the most rigid clinical and serological examination of the children of syphilitic women fails to elicit the slightest evidence of syphilis, although it is to be admitted that one cannot be absolutely sure of freedom from infection as it is well known that the disease of the child may be so latent that lesions do not develop until very late in childhood, and indeed not until adult age has been reached. It is not at all uncommon to see Interstitial Keratitis appear as the first sign at the age of twenty or later. Kolmer furthermore believes that a wife may be infected directly by the semen without involving the question of pregnancy, and especially if her husband's testicles are infected with *T. pallida* as is now regarded of frequent occurrence even in the absence of clinical signs of infection. In such cases the disease may run a very mild course without its presence being suspected, the wife being entirely ignorant of the infection because the *Treponema* are of greatly reduced virulence.

It is held in some circles that the *T. pallidum*, or a small spore-like form of it, may cause direct infection of the ovum, but that the mother may escape infection owing to the destruction of the *Treponema* by placental ferments (Routh).

It should also be remembered that if the mother is suffering from active untreated syphilis the child may be affected during delivery and so suffer from acquired syphilis.

The Effect of Pregnancy upon Syphilis

The exact manner in which syphilis is influenced by pregnancy is as yet unknown. The fact still remains, however, that its entire effect can be summed up in the one word "latency." This latency may also be transmitted to the foetus. Moore believes that "a properly controlled pregnancy may be a valuable therapeutic measure in the treatment of syphilis in women, enhancing the probability of an ultimately favourable outcome."

It has been observed that if a woman contracts syphilis just prior to, or coincident with, or shortly after conception, the usual signs and symptoms of early syphilis are sometimes not apparent, or if they are, tend to be less severe than in the non-pregnant woman. This suppression of symptoms also seems to continue to the later stages of the disease, especially regarding the appearance of neuro-syphilis.

Kolmer points out "that the evidence at hand indicates that the mother is less extensively infected than is general in males and in non-pregnant females, and hence there is no reason for believing that antibody production in the pregnant individual is greater than usual if we accept that antibody production primarily occurs in syphilitic foci and therefore is roughly parallel with the degree of dissemination of the spirochaetes and the number and size of syphilitic lesions. Rather it would appear that the enhanced immunity of the pregnant subject is due to a re-enforcement, and if this is true, one naturally suspects that the new tissues of pregnancy are actively concerned in the process, since it has been shown that they are frequently infected. On the other hand, pregnancy and lactation may increase invasiveness, virulence and general pathogenic properties of the spirochaete, suggesting that the immunity mechanism may be depressed in some way. Either the influence of pregnancy is exerted by some effect upon antibody production or through some other agencies connected with the pregnant state and operative very early in pregnancy, which reduces the pathogenicity of *T. pallidum*."

Personally I see no reason why there should not be carriers of *Treponema pallidum* just as we know there are carriers of diphtheria, typhoid fever, and, as at last I think it has become recognised, of gonorrhoea. This would explain a considerable number of the events now explained by the vague term "latency," if we infer by latency a positive serological reaction without clinical signs.

GONORRHOEA

It is not uncommon that when a woman becomes pregnant, she complains of losing some vaginal discharge. This may be due to a simple increase in the normal secretions, which are increased owing to a varying amount of congestion which usually occurs. This congestion is most marked after the fifth month of pregnancy. The discharge, however, may be pathological and may be due to infection by organisms or parasites, the commonest of which are the **gonococcus**, **Trichomonas vaginalis** and **Monilia**. Such infections readily occur during pregnancy.

With regard to *Trichomonas vaginalis*, it should be pointed out that infestation with this organism may produce all the signs and symptoms of an acute gonococcal infection. The same complications, such as Bartholinitis, endometritis and salpingitis may also occur. More and more evidence seems to be coming forward that this infestation should be classified as a venereal disease. The failure to isolate the organism in cases of non-specific urethritis in the male, is probably due to faulty technique. This may account for many of our difficulties in clearing up this type of urethritis, which is known to be very persistent and to respond very poorly to the sulphonamides. The occurrence of *Trichomonas* infestation in the male has been reported by various investigators, as follows:

Liston and Lees	..	..	..	..	4 per cent
Riba and Harrison	..	..	..	..	10 per cent
Allison	..	..	..	..	15 per cent

Allison states in his articles that "inasmuch as the draftees, earlier mentioned as being sent to the Atlanta Venereal Clinic, had been rejected by the Medical Department of the Army because they had venereal disease, it may be inferred that the Army considers trichomoniasis a venereal disease."

Routine tests should be carried out in all pregnant women, especially if they are complaining of discharge accompanied by soreness, irritation or dysuria. Warty growths on the vulva should immediately arouse suspicion. These, in my experience, tend to be more profuse in the non-gonococcal diphtheroid discharges. It is always well to enquire into the health of the consort, as a history of a discharge or previous venereal disease, may be of importance.

Detection.

The symptoms of discharge, irritation and dysuria tend to appear three to fifteen days after exposure to infection. The patient should not have passed urine for at least two hours prior to examination. The lithotomy position is the most convenient for carrying out the investigations. The vulva is carefully inspected for any signs of inflammation, excoriation or abrasion. The presence of warty growths (condylomata acuminata) is noted. Palpate the inguinal glands and note any enlargement. They are generally moderately enlarged and sometimes tender. Palpate the labia, especially paying attention to Bartholin's glands. The presence of a scar or thickening may be evidence of previous disease. Having gently passed a cotton wool swab over the vulva, to remove any surplus secretion, attention should be directed to the urethra. In cases of acute infection a bead of pus may be observed at the meatus. If nothing is observed, pass a finger into the vagina and gently milk the urethra forwards. This in chronic infections may bring to light a mucopurulent secretion, analagous to the gleet seen in chronically infected males. In any case, gently pass a sterile platinum loop into the canal and transfer any secretion, first to a slide and then to a culture. Next gently introduce a suitable size of speculum into the vagina and carefully note the condition of the vaginal walls and the amount and nature of discharge present. In gonorrhoea the walls are uniformly inflamed and reddened. The discharge varies from mucoid to purulent and is greenish-yellow in colour.

Trichomonas vaginalis produces a strawberry appearance of the vaginal wall. Small white papillae stand out on a deep red background. The discharge is more watery than in gonorrhoea, and is often frothy in consistency. The cervix uteri is also affected.

Fungi infection produce a uniform reddening, but the discharge is apt to be like dry cheese, and the cheesy flakes appear to stick to the vaginal wall.

Collect by means of a pipette some pus from the post-vaginal fornix and transfer this to a plate culture. KING and MASCALL showed that this was a common site for a gonococcal infection. A platinum loopful of pus should be mixed on a slide with an equal amount of normal

saline for examination by darkground illumination for *Trichomonas vaginalis*; fungi can be identified in a smear stained with methylene blue.

Swab out the vagina carefully and next pay attention to the cervix uteri. The character of any discharge from the external os should be observed. This again may vary from mucoid to purulent, and vary considerably in amount. A sterile platinum loop should be passed directly into the cervical canal and specimens of the secretion transferred to a slide and culture.

A bimanual examination should be made in early cases of pregnancy, and tenderness and thickening of the Fallopian tubes should be noted. A specimen of blood is required for the gonococcal complement fixation test. This is especially useful in chronic cases. A positive reaction indicates that the patient has, or had, gonorrhœa.

Smears should be stained by a differentiating stain, such as Gram's stain or one of its modifications. Single stains are most unsatisfactory and lead to many errors in diagnosis. Cultures should be used warm and a reliable tried medium, such as Price's Egg Albumen medium, should be selected. They should be returned to the incubator immediately after inoculation, where they should be incubated at 37° C. for forty-eight hours.

The Effect of Pregnancy on Gonorrhœa

It seems probable that a pregnant woman is more liable to infection than a non-pregnant woman, owing to the increased congestion present. There is no doubt at all that when infection does occur during pregnancy, it is more acute than at other times. Complications are not more liable to occur during pregnancy than at other times, but special attention should be exerted during the puerperium, as dissemination of any existing infection may occur at this time, or an old infection may be flared up.

The Effect of Gonorrhœa on Pregnancy

Provided that normal precautions are taken and that the accoucheur knows that the patient is suffering from gonorrhœa, no ill-effects should occur. Nature is very kind in providing a prophylactic douche when the waters break, and every endeavour should be made to delay the rupture of the membranes as long as possible.

The real danger lies in the risk of the infant being infected during delivery. Genital infection may occur, especially in female infants, but here again nature takes a hand. It is well known that owing to the oestrin which is circulating in the maternal blood the infant vagina is more resistant during, and just after, delivery than it is some time afterwards when this source of the supply has been cut off. By far the most serious infection is that of the child's eyes causing **Gonococcal Ophthalmia**. This used to be one of the most frequent causes of infantile blindness, but by the introduction by Credé of instilling the eyes immediately after delivery with silver nitrate 2 per cent, it has been greatly reduced in incidence. It was found that 2 per cent was apt to cause a severe reaction itself, so the strength has now been reduced to 1 per cent. This should not be omitted in any case, whether infection is suspected or not. According to the Ministry of Health returns the following cases have been reported.

1938	..	..	..	..	5,168
1940	..	..	..	..	4,390
1942	..	..	..	..	4,516

Probably the greatest effect which gonorrhœa has on pregnancy is that it is the best contraceptive known. There is no doubt that gonorrhœa is the commonest cause of sterility in women. It has been said that at least 50 per cent of sterility is due to this cause. Sterility frequently follows endocervicitis, endometritis and salpingitis. In the case of the former, the endocervicitis may give rise to an alteration in the reaction of the vagina, so setting up a barrier to the progress of the sperms. Endometritis probably prevents the implantation of the ova. When involvement of the Fallopian tubes occurs, the inflammatory process may cause a simple "glueing-up" of the lumen. This may, however, be followed by a stricture, and finally complete obliteration, of the lumen. The ovary, which is in close proximity to the tube, rarely escapes. Thickening of the tunica albuginea, due to its involvement in the spread of the inflammation, may prevent rupture of the ripe Graffian follicles. Another type of sterility frequently seen in gonococcal infections is the so-called "one child sterility." Here a pregnancy takes place

normally, but during the time his wife is carrying the husband becomes infected. He in turn infects his wife shortly before parturition. Parturition is followed by a rapid spread of the infection to the uterus and tubes, resulting in subsequent sterility. A chronic endocervicitis following parturition will also form a persistent narrowing of the cervical canal and give rise to this type of sterility.

The remaining three venereal diseases, Chancroid, Granuloma Inguinale and Lymphogranuloma Inguinale, as far as our present knowledge extends, have no effect on pregnancy, except if the lesions are present during delivery they may make this more difficult. It has, however, been pointed out by recent research in America, according to the UNITED STATES HEALTH SERVICE, that in the case of Lymphogranuloma inguinale, the virus is transmitted in pregnant mice *via* the placenta into the foetus. There are also some cases on record when the child born of a mother with this infection reacted positively to Frei's test. It is stated, "Although we have not been able to confirm this, it is conceivable that pregnancy during the active phase of this disease could prove infectious for the foetus in utero."

The lesions themselves are not influenced by pregnancy except they may be more acute in the pregnant woman. The infections are all imported from abroad, and although they do occur in this country are not at all common.

CHANCROID

The commonest infection of the three is due to the bacillus of Ducrey.

After an incubation period of three to five days, the initial lesion appears at one of the following sites: the labia, clitoris, fourchette, vestibule, anus or cervix, as a small vesicle or pustule. This rapidly breaks down, leaving a sharply circumscribed saucer-like ulcer. The edges of the ulcer are ragged and undermined, and the base covered with a dirty grey exudate. It is surrounded by a red areola. The lesions are very painful and may be multiple. Occasionally a phagedenic type occurs which spreads rapidly and causes extensive deep necrosis. The labia may be completely destroyed. Contact sores may appear and spread to the perineum, groins, or thighs. They tend to be shallower and more persistent than the primary lesion.

In over 50 per cent of cases there is an accompanying adenitis, which is usually unilateral. The bubo, which is adherent to the skin, is erythematous and painful. Softening, fluctuation and subsequent suppuration may occur. Spontaneous rupture may cause ragged, necrotic ulceration of the groin.

Diagnosis depends on an intradermic skin reaction, using a vaccine of Ducrey's bacillus, namely *Dmelcos Diagnostic Vaccine*. Positive results are obtainable eight days after infection. The test may, however, remain positive for ten or more years after an initial infection. The Wassermann Reaction should be repeatedly taken over a period of at least three months.

GRANULOMA INGUINALE

This is due to infection with the Donovan body. The infection takes the form of an insidious granulomatous process which involves the inguinal region. The commonest sites for the initial lesion which is a small vesicle, papule, or nodule, are the labia, clitoris, vaginal orifice, inguinal region, perineum or buttocks. The cervix is rarely attacked.

The lesion becomes eroded and leaves a beefy, raw ulcer with a granular base. In the female the early lesion which is non-painful, may appear as a raised, velvety-smooth tuft of granulation tissue which bleeds readily, particularly at the muco-cutaneous juncture of the vaginal orifice. The inguinal involvement is always secondary to the genital lesion which may be so transient that it is not observed. Gradual spread occurs, and there is no tendency to heal. Marked ulceration may be caused by the coalescing of secondary lesions. The advancing border of the lesion has characteristic rolled edges. Scar formation may occur at one edge, whilst the other is progressing. The condition is extremely chronic, and when the lesions have been present for some time a peculiar pungent odour emanates. Secondary pseudo-elephantiasis of the labia may occur. Diagnosis depends on smears and biopsy.

LYMPHOGRANULOMA INGUINALE OR CLIMATIC BUBO

Lymphogranuloma Inguinale is a virus disease characterised by a small transient sore somewhere on the genitalia. This sore frequently evades notice as it is non-painful, non-irritant and non-indurated. It appears as a small vesicle or ulcer, with a slight serous discharge. It

is clear cut, and is surrounded by a red areola. The commonest site in the female is on the posterior vaginal wall, or in the precincts of the fourchette. Adenitis occurs in the area drained by the lymphatics from the primary lesion, and this may give rise to one of three syndromes.

(1) **Inguinal syndrome.**—In the early stages a simple, discrete movable gland appears in the groin. Extension to other glands occurs, forming a lobulated or elongated bulging mass. The skin becomes adherent and takes on a purplish hue. Irregular areas of softening occur which break down, thus producing numerous fistulous tracts. The buboes are usually unilateral. Spontaneous healing occurs in about a quarter of the cases.

(2) **Genital Syndrome (Esthiomene).**—In the female elephantiasis of the vulva or clitoris commonly occurs. In the case of the labia this may be uni- or bilateral. The swelling has a rubbery consistency, and the surface is smooth, verrucose, polypoid or ulcerated. Pedunculated tumours of the labium and clitoris commonly occur. Vaginal stricture or recto-vaginal fistulae may be met.

(3) **Ano-rectal syndrome.**—Accompanying the genital lesion polypoid or lobulated growths may appear around the anal orifice. These tags may be easily mistaken for haemorrhoids in the early stages. Stricture of the rectum may occur without any other sign of infection. A history of a bubo may be sometimes elicited. The stricture is cylindrical of the "rubber hose" variety, occurs just above the anal orifice. It is progressive, and difficulty may be experienced in introducing a finger for examination. Pain and purulent discharge may be accompanied by blood-stained stools and rectal haemorrhage. Malignant changes are liable to occur.

Diagnosis depends upon Frei's intradermic skin reaction, in which an antigen prepared from the bubo of a known case is employed. The results are taken in forty-eight hours.

In conclusion, it must be remembered that with any of the three latter conditions, it is possible to have a co-existent syphilitic infection, and this must always be looked out for and carefully excluded. Blood tests should be taken at intervals spreading over three months. It can safely be said that any genital sore should be examined, whenever present, by the dark-ground method if error in diagnosis is to be avoided.

REFERENCES

- FOURNIER, *Clinical Aspects of Heredosyphilis*.
SOLOMON and SOLOMON, *Syphilis of the Innocent*.
BURKE, E. T., *Venereal Diseases*.
NABARRO, D., *Personal Communication*.
STOKES, J. J., *Modern Clinical Syphilology*.
BROWN and PEARCE, *Arch. Dermat. and Syph.*, 1920.
KOLMER, J. A., *Chemotherapy with special reference to the Treatment of Syphilis*.
ROUTH, *Lancet*, 1920.
MOORE, J. E., *Modern Treatment of Syphilis*.
LISTON and LEES, *Brit. Journ. Ven. Diseases*, 1940.
KING and MASCALL, *Lancet*, 1935.
UNITED STATES HEALTH SERVICE, *Syphilis in Mother and Child. Management of Chancroid*.