TRICHOMONIASIS.

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During the last eighteen months I have seen 175 women suffering from ill-health due to this infection, of these 31 were private patients. In all of them I saw the trichomonas alive in a vaginal smear.

Definition.

The trichomonas hominis is a protozoon flagellate discovered by Donné in 1837. It is oatseed shaped and about the size of a leucocyte. The pointed end shows a tail-like process which is the end of the axostyle. The blunt anterior end has three, four, or five flagellæ, one of which, the longest, moves independently, and all waft bacteria or debris into the stoma or mouth at the base of the flagellæ at the side of the animacule. Reproduction is by binary fission and encystment does not occur.

Morphology.

Staining and culture of this protozoon is difficult, and this has been the reason of the failure until recently to detect it as a cause of disease. It is best seen in a fresh state, when its jerky movements lead to its easy diagnosis. A slight smudge on the centre of a clean slide with a gloved finger which has been contaminated by the vagina of an infected patient is all that is required. Immediate dilution of this with one drop of normal saline or Locke's solution and the insertion of the slide under the microscope will expose to the low power numerous round cells, which are mainly pus cells. Even under the low power, movements of the trichomonas amongst these leucocytes can be detected which become immediately obvious under the high power. I use a solution of Locke's or normal saline stained by Safranin or Eosin. This stains the leucocytes but not the trichomonas. The flagellæ are difficult to see unless under dark ground illumination. Some specimens show very active movements, while some are sluggish. The thin and ill fed ones look like miniature crayfish and move quickly, the larger and better fed ones seem to get rounder and are detected by one flagella moving like an outstretched finger, the tail and other flagellæ seemingly becoming immersed in the rounded body.

Pathology.

The extent of the pathology of this disease is looked on as nil by some and as almost infinite by others. Text books of repute state that its presence in the human body is of no pathognomonic significance. Recent writers, like Dr. Hees of Wiesbaden, who has cultivated this protozoon not only from the blood stream of infected women, but also from that of their husbands, from the lumen of pus tubes, placental debris and cancerous growths of the vagina and uterus, is convinced of the great and serious ravages caused by this disease.

Other workers find that the animal, although living on bacteria, like Döderlein's bacillus and the gonococcus, seems to live in symbiosis with a streptococcus, so that it may act as a carrier of infection by this streptococcus and produce metastatic infections such as endocarditis, breast abscesses, arachnoiditis, etc.

I find as a result of my investigations that I favour the serious view of the possible dangers of the disease. I have seen it in patients who have died—one with arachnoiditis—and I am now also enquiring into the health of the husbands of the patients infected.

Chronic prostatitis and urethritis in the husbands are not uncommonly indicated—thirty such being reported by a Chicago clinic in 1936.

It was found that 18 per cent. of a series of trichomonas cases were also infected by the gonococcus.

Etiology.

The following possible causes were blamed in my cases. Sleeping in infected bedclothes, using garments infected recently, sleeping with infected women, re-infection from the husband, bathing in swimming pools, using an infected douche apparatus.

The organism can only multiply at body temperature, but it can remain alive in milk at ordinary temperatures for days and can resist for a short time low temperatures sufficient to kill bacteria.

The time of onset of the infection was usually that at which the pH. of the vagina is less acid than usual, i.e. during and after a period, during pregnancy or after a miscarriage.

Signs and Symptoms.

Very few, or a great many signs and symptoms may be present in those infected. In view of the liability to exacerbations of infection and especially of ascending infection, causing salpingitis and ovaritis of the adhesive type resulting in severe dysmenorrhœa, backache and fixed retroversion, all cases detected should be treated seriously and effectively at once.

Discharge occurs in about 90 per cent. of the cases. It is usually greenish yellow or dirty white, irritating and foul smelling. Its consistency is watery and it may be frothy. Its pH. is about 6. It is worse during the days before and after the period and appears to be most copious in the morning on rising from bed.

Vaginitis occurs in about 20 per cent. of the cases. The vaginal wall is pinkish as a rule, like the inside of the cheek. Occasionally it is an angry red and shows punctate hæmorrhages from small raw areas. This results in the additional complaint of dyspareunia and dysuria.

Dysmenorrhœa and menorrhagia are common complaints due probably to the congestion of the endometrium caused by the infection.

Backache and thigh pains are also common symptoms and only yield to treatment when the causal infection is discovered and removed. They are due to an ascending infection causing an adhesive salpingitis and ovaritis which results in cysts of the ovaries and retroversion of the uterus. I have operated upon three or four such cases before discovering that they were trichomonas cases and in all adhesions were found, binding down the tubes and ovaries to the back of the broad ligament and to the pouch of Douglas and thereby causing a fixed retroversion of the uterus.

Sterility is a frequent complaint amongst those infected. In view of the pelvic adhesions and leucorrhœa caused by the disease, this is easily understood.

Miscarriages amongst those affected are not infrequent. Trichomoniasis, apart from the pelvic adhesions and misplacements of the womb it causes, is in itself, I believe, a cause of miscarriage. Twelve cases in my series had one or more miscarriages and no children.

Stillbirths and foetal abnormalities may result from infection. I discovered five foetal abnormalities amongst my parous cases. They mostly occurred in the twenty-one cases which were infected before conception. The drainage of glycogen from the mother caused by the constant discharge probably accounts for these happenings.

Severe vomiting of pregnancy may occur in the early months of pregnancy of those infected. I had five such cases and in all the sickness was at once cured by treatment of the infection.

Marital unhappiness. In view of the dyspareunia, lack of sex feeling, and general ill health of many of the cases, it is not surprising to find that 7 per cent. of the married women were separated from their husbands. Several cases had assumed for years that they were afflicted with gonorrhœa.

Dizziness after sudden movement of the head occurred as a complaint in many cases and in some it had resulted in an actual fall.

Sex determination. In October, 1932, this journal published an article of mine on sex determination, in which I stated that clinically I found that sex was decided in four cases out of five by the pH. of the vagina, which is affected by the orgasm of the female at coitus.

The discharge in this disease is acid—pH. 6—and copious as a rule. An orgasm even if it does occur is therefore not likely to affect the pH. to any extent.

Taking all the parous cases in my series and noting the sex of their last child and also noting whether they were infected before or after conception, I found my results were as follows:—

	Boys	Girls
Infection after conception	34	35
Infection before conception	4	18
Normal sex ratio	105	100

Although these figures are small, I regard them as corroborative evidence of the theory. In addition, I find that some of those infected for years produced a series of daughters—one produced four, and three produced two and no sons.

The pH. is not the only factor in sex determination, but I regard it as the largest factor. One of my series produced twins, a boy and a girl.

General symptoms. Depressed mental outlook, nervous breakdown, lack of sex feeling, severe hemicrania, attacks of sickness, flatulent distension, always feeling tired, always feeling cold, anæmia, colitis, pruritus vulvæ, and attacks of cystitis, repeated themselves as symptoms in my history sheets of these cases.

Unsuccessful operations were a special feature, which is only to be understood, as the general recognition of this parasite as a cause of disease is recent and also because its detection on a film apart from special fixing and staining is impossible, unless it is looked for immediately, which up to the present, has not been the custom.

These operations included dilatation and curettage, cauterisation of the cervix, amputation of the cervix, radium to the cervix, circumcision, Whitehead's operation, Ball's operation, hysterectomy, suspension operations, prolapse operations, ovariectomy and salpingectomy.

Treatment.

It is essential first of all to be sure of the diagnosis, for this, immediate examination of a fresh smear under the microscope is essential. In a small proportion of cases, staining a smear or using a culture method is necessary to diagnose the presence of the organism.

Having found the *Trichomonas* present, then treatment should be continued for two months at least, even in minor infections. In deeper infections of the system, *e.g.* where salpingitis is present, I regard additional intensive treatment in bed for ten days as a wise measure.

I am at present testing various treatments, such as the vaginal insertion of tablets of Devegan and Stovarsol, insufflation of the vagina with powders like Picragol, Yatren and arsenic by mouth, Emetine and Neosalvarsan by injection, and dieting on proteins.

The simplest and commonest routine treatment is to direct that a Stovarsol or Devegan tablet be inserted high up in the vagina each night when in bed, that douches should not be used, and that the tablets should also be employed during period times and until two periods at least have passed.