ABC of Sexually Transmitted Diseases

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VAGINAL DISCHARGE: DIAGNOSIS

Pathological causes

Infective:

Candida albicans
Chlamydia trachomatis
 Non-specific agents
Neisseria gonorrhoeae
Trichomonas vaginalis
Gardnerella vaginalis
 Cervical herpes genitalis
 Cervical warts
 Syphilitic chancre
 Toxic shock syndrome
 (? *Staphylococcus aureus*)
 ? *Ureaplasma urealyticum*
 ? β haemolytic streptococci

Non-infective:

Cervical ectropion
 Cervical polyps (s)
 Neoplasm
 Retained products
 (tampon, postabortion, postnatal)
 Trauma
 Allergy

Vaginal discharge is a common presenting symptom seen by general practitioners, gynaecologists, and those working in family planning clinics and departments of genitourinary medicine. As with urethral discharge, vaginal discharge may be either physiological or pathological in origin. It is difficult to know what proportion of discharges belong to either category since there have been few community based prevalence studies.

Physiological causes—Vaginal discharge is a continuum, and as such the concept of normality does not exist. Some patients have a copious discharge, others none or little. Only the patient can, therefore, determine what is her own normal experience. It is worth while reminding patients that a normal vaginal discharge may increase and be noticed only premenstrually, at the time of ovulation, or when using the contraceptive pill or an intrauterine device.

Pathological (infective) causes—The commonest organism giving rise to an infective pathological vaginal discharge is *Candida albicans*. Other infections causing this symptom may be due to agents such as *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Trichomonas vaginalis*, and *Gardnerella vaginalis*. Cervical lesions due to herpes, warts, and a syphilitic chancre may also cause a discharge. There is some doubt about whether *Ureaplasma urealyticum* and haemolytic streptococci do cause a vaginal discharge, and the discharge of the rare toxic shock syndrome is usually coincidental and overshadowed by the patient's general condition.

Pathological (non-infective) causes—Localised cervical lesions such as ectropion, polyps, and neoplasms may present with a vaginal discharge. It is surprising what may be retained in the vagina without the patient's knowledge: tampons and the occasional condom are common, but cloves of garlic have also been found. Trauma may be caused by sexual aids and irritant substances.

History

High risk profile

Partner change
 Multiple contacts
 Recurrent symptoms
 Symptoms in partner
 General symptoms:
 Abdominal pain
 Menstrual problems
 Rash
 Dyspareunia
 Arthralgia

As with urethral discharge, a careful history, physical examination, and microbiological tests are essential to establish an accurate diagnosis and to exclude a sexually acquired infection.

Certain points in the clinical history suggest that a sexually transmitted disease is a possibility—such as the development of symptoms after a recent change of sexual partner or recent multiple sexual contacts. To avoid contracting a sexually transmitted disease both partners need to be monogamous. The patient must, therefore, be asked whether her sexual partner has had intercourse with anyone else. Further points that should make the doctor suspect a sexually transmitted disease are symptoms in the patient that are recurrent or persistent and symptoms in her sexual partner. A urethral discharge in a woman's partner makes it highly likely that her symptoms are due to a sexually transmitted infection. Irritation, soreness, and redness of her partner's penis after sexual contact suggest infection with *Candida albicans*. Finally, the patient should be asked about any other symptoms that suggest complications of a sexually transmitted disease—for example, abdominal pain, rash, arthralgia, dyspareunia, or altered menstruation.

Neither the patient's symptoms nor a subjective description of the colour and quality of the discharge are of much value in reaching an accurate diagnosis. Even more so than in men genitourinary symptoms in women are a poor guide to the exact nature of the condition.

Physical and laboratory investigations

If a sexually transmitted disease is suspected from the clinical and sexual history the patient should be examined fully to exclude possible complications and coincidental abnormalities. Once the physical examination has been carried out local genital examination and tests should be undertaken. As with the symptoms, the physical signs and macroscopic appearance of a vaginal discharge do not help in making an accurate diagnosis. For instance, to rely on the suggestion that the discharge of vaginal candidosis is thick, curdy, and white will result in the wrong diagnosis in most instances. Similarly, no reliance should be placed on the supposed association between a frothy greenish discharge and trichomoniasis.

Infection can be diagnosed accurately only after microbiological tests have been carried out on samples from the appropriate anatomical sites. Women attending departments of genitourinary medicine have tests performed routinely to establish or exclude a diagnosis of candidosis, trichomoniasis, gonorrhoea, and often *Gardnerella vaginalis* infection. So that samples may be obtained from the appropriate sites a speculum should be passed to visualise accurately the cervix, posterior fornix, and the vagina. The reason these tests are performed routinely is because sexually transmitted diseases may occur concurrently. In clinics one fifth of the cases of trichomoniasis are associated with gonorrhoea. Many authorities do not consider that candidosis is sexually transmitted, but despite this it is associated with other sexually acquired conditions in a third of cases.

Candida albicans may be excluded by microscopy of a Gram stained smear and by culture of material from the vaginal wall. Both spores and mycelia stain Gram positive. Since some cases may be missed when microscopy alone is relied on cultures should be carried out to confirm the diagnosis or they may be used alone without microscopy. Traditionally, cultures are plated on Sabouraud's medium and incubated at 37°C for 48 hours; Stuart's or Amies's transport medium may be used when necessary. Other yeasts—for example, *Torulopsis glabrata*—also occasionally inhabit the female genital tract and grow on culture. Definitive differentiation may be achieved only by additional tests. *Trichomonas vaginalis* is usually best isolated from the posterior fornix, and a wet preparation using a drop of saline should be examined immediately by dark ground microscopy. Though the diagnosis may be confirmed by culture, microscopy alone is extremely reliable. The specimen of discharge must be placed directly into Feinberg-Whittington medium and incubated for 48 hours at 37°C or sent to the laboratories in Stuart's or Amies's transport media.

Gonorrhoea is an infection of mucous membranes, and since the vagina is lined with stratified squamous epithelium a high vaginal swab is not the best method of sampling in diagnosing this condition. The most productive sites for isolating the gonococcus are the endocervix and the urethra. Specimens should be taken from both sites, Gram stained, and cultured. As with specimens of urethral discharge the culture material may be put into a suitable transport medium (for example, Stuart's) or plated directly and

Gonorrhoea: diagnosis by site of infection

Isolation rate for *C trachomatis*

Gonorrhoea contacts	30-60%
Non-gonococcal urethritis contacts	30-35%
Attending GUM clinics (excluding above groups)	2-17%
Attending family planning/well women clinics	2-7%

incubated. Gram stained microscopy for *Neisseria gonorrhoeae* in women is unreliable. Reliance on this alone results in about a half of cases being missed. All women in whom gonorrhoea is suspected should therefore have cultures performed in addition to microscopy. One set of smears and cultures should detect 90% of cases. This figure may be increased by repeat testing and by sampling other sites.

The gonococcus may be isolated from the rectum in women with gonorrhoea in about 6% of cases in which it is not found in the conventional sites, the cervix and urethra. Proctitis arises more often by autoinoculation from vaginal discharge than from anal intercourse. For this reason all women who are contacts of men with gonorrhoea should have rectal tests carried out in the hope of increasing the chances of isolating the gonococcus.

C trachomatis is now known to be an important sexually transmitted agent which often causes asymptomatic infections and may occur concurrently with other sexually acquired agents, in particular *N gonorrhoeae*. Unfortunately, facilities do not yet exist for isolating this micro-organism in all laboratories supporting departments of genitourinary medicine. If they do an endocervical specimen should be cultured for *C trachomatis* in any woman attending a clinic. If only limited microbiological services are available cultures should be limited to women who are contacts of men with a gonococcal or non-gonococcal urethritis and in those presenting with a complication of these two conditions—for example, pelvic inflammatory disease.

The final agent that should be looked for is *Gardnerella vaginalis*. Certain clinical and diagnostic features seem to be associated with this infection: a fishy smelling discharge, which is particularly noticeable after sexual intercourse; the presence of clue cells (bacteria attached to vaginal epithelial cells) in a drop of infected discharge mixed with saline and viewed under the microscope; a pH of the vaginal discharge ≤ 5 (easily measured by pH paper); and a positive result on the Amies test. This test is performed by adding one to two drops of discharge and 5-10% potassium hydroxide together on a glass slide. If a fishy ammoniacal odour is released the result is positive. A similar smell may be obtained when *T vaginalis* or spermatozoa are present in the vaginal discharge in the absence of *G vaginalis*. The organism may be cultured using Stuart's or Amies's transport media.

Finally, all patients should have serological tests for syphilis carried out to exclude this as a concurrent infection, their urine tested for protein and glucose and cervical cytology if not performed in the previous year.

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Investigation of vaginal discharge

History and examination (including bimanual pelvic examination)

Microbiological investigations

Essential

Microscopy and culture for:

N gonorrhoeae and *C albicans*

Microscopy or cultures, or both, for:

T vaginalis

Desirable

Cultures

C trachomatis

In all patients; if not possible then in selected patients:
contacts of men with gonococcal or non-gonococcal urethritis
those with complications (pelvic inflammatory disease)

Microscopy or cultures, or both, for:
G vaginalis

If clinically indicated

Microscopy, or culture for:
N gonorrhoeae
(smears and cultures from rectum if contact, or rectal symptoms)

Herpes simplex virus
(ultral or cervical lesions present)

Urine analysis—protein, sugar

Serological tests for syphilis

Cervical cytology
(all new patients to clinic if not performed previous 12 months)

Investigate sexual contacts