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Focus

Abnormal vaginal discharge

Margaret J Sparrow is a sexual health physician and medical training officer in Wellington

DIAGNOSIS

The differential diagnosis of abnormal vaginal discharge should be based on the following general features.

Normal secretions

There is variation in the range of normal secretions, and sometimes women need reassurance that their vaginal discharge is normal. Some women are unaware of the cyclical variations and the mid-cycle peak flow of mucus. Women are very sensitive to a change in vaginal odour, and this should always be elicited in the history if not volunteered.
The pH of the normal vagina is acidic, between 3.8 and 4.5. This can be checked by taking a spatula scraping from the lateral vaginal wall and applying to pH tape or test strip. The sample should not be taken from the cervix as these secretions are alkaline.
The lubricating fluid released from the surface of the vaginal walls during sexual arousal is a transudate. Rarely women may describe a free flow of vaginal fluid (female ejaculation) which is difficult to distinguish from urinary incontinence.

Life cycle changes

Before puberty and after menopause, oestrogen levels are low, the vaginal epithelium is thin, and the pH is higher. Atrophic vaginitis may occur in postmenopausal women. In prepubertal girls the commonest infections are *Streptococcus pyogenes*, *Shigella spp*, or (in cases of sexual abuse) a sexually transmitted infection such as gonorrhoea, chlamydia or trichomonas. *Enterobius vermicularis* (pinworm) can cause a vulvovaginitis.

Foreign bodies

In children a variety of objects can find their way into the vagina. In adult women the two most common items are retained tampons and burst condoms. The offensive discharge will resolve spontaneously once the object is digitally removed, and swabs and antibiotics are unnecessary. The healthy vagina is self-cleansing, and douching for personal hygiene is not recommended.
If a tampon is impacted it can be removed under good vision with sponge-holding forceps. The main problem is minimising the offensive odour that can envelop the consulting room. Air freshener is often required. Two techniques for removal are recommended:

1. Have a container of water as close as possible to the introitus and immerse the tampon quickly

KEY POINTS

- Non-infectious causes of an abnormal vaginal discharge must be excluded
- A careful sexual history is essential
- Unless prohibited by pain, a speculum examination should be carried out
- pH tape and 10% KOH are simple additions to the consulting room equipment which will improve diagnosis
- In the reproductive age group, the two commonest causes of an abnormal vaginal discharge are thrush and bacterial vaginosis, and now and then they occur together
- Although thrush is very common, it is important to remember that not all itches are thrush and the diagnosis should be confirmed by swab or smear
- While most cases of abnormal vaginal discharge are easily diagnosed and treated in general practice, difficult cases may require specialist referral

under the water. Cover with a tight-fitting lid and dispose of with other surgery rubbish. Flushing down the toilet is less acceptable, especially with septic tank systems.
2. Have a thick plastic bag as close as possible to the introitus and quickly place the tampon in the bag and secure the top. Wrap in another rubbish disposal bag and place in lidded container for waste disposal.

Upper genital tract infections

Chlamydia trachomatis and *Neisseria gonorrhoea* may be asymptomatic or they may present as a cervicitis with vaginal discharge. They may cause an endometritis, salpingitis or pelvic inflammatory disease.
Fitz–Hugh and Curtis syndrome1 is an ascending peritoneal infection which localises around the liver causing a perihepatitis. A young woman presenting with right upper quadrant pain should always have a careful history and examination to exclude genital causation.
Herpes simplex cervicitis may be associated with a profuse watery, straw-coloured discharge.

Lower genital tract infections
In order of frequency the three most common vaginal conditions are candidiasis (thrush), bacterial vaginosis (BV) and trichomoniasis.

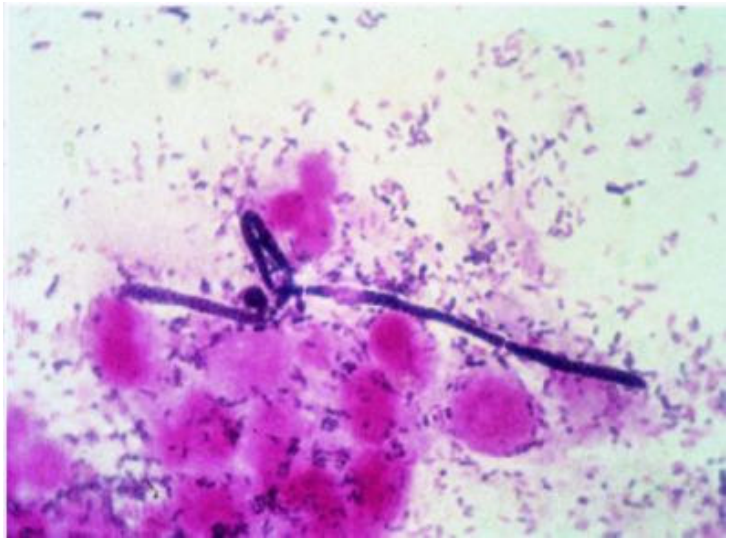

Figure 1. If microscopy is available, thrush can be detected by the presence of hyphae and spores on a Gram stain as shown in this photomicrograph. Thrush is often reported on a cervical smear and can also be seen unstained on a saline wet mount

1. Candidiasis (thrush)

Candida is a opportunistic yeast which thrives in a wide pH range. It is a normal commensal in the vagina. When symptoms occur, the culprit in about 95 per cent of cases is *Candida albicans*, but other species such as *C. glabrata* may be responsible. Iatrogenic thrush is most commonly precipitated by antibiotics.
Hormonal status may be significant. Thrush is rare in prepubertal girls and in postmenopausal women unless using hormone replacement therapy. It is less common in women using Depo-Provera and during lactation. It commonly appears in early pregnancy. In earlier times, higher-dose oral contraceptive pills contributed to the growth of thrush, but with modern low-dose pills this is not usually a problem.
Thrush may be associated with diabetes or an altered immune state, eg, HIV infection or immunosuppressant drugs. Frequently there is no known predisposing cause. Candida is present throughout the gastrointestinal tract but this is not considered an important reservoir of infection. Although in some instances re-infection from a male partner may occur, this is no longer regarded as a major source, and routine examination and treatment of the male partner is not justified unless he is symptomatic.

Symptoms in the female range from mild to severe with varying degrees of itching, irritation and vulval soreness. Classical acute thrush produces a white cottage-cheese-like discharge, but this is not the most common presentation. Sometimes cracks or ulcers appear in the vulval skin and scratching may lead to further skin damage with superficial dyspareunia or dysuria. There may be swelling and inflammation, especially if there is a hypersensitivity to Candida. Diagnosis should be confirmed with a vaginal swab test or cervical smear. Many women have treated themselves for long periods with various antifungal treatments, without improvement, because the underlying cause of their itching has not been fully investigated.

2. Bacterial vaginosis (BV)

There is increased vaginal discharge without significant pruritus or pain. The diagnosis is made when three out of four of Amsel's criteria are present:

- alkaline pH > 4.5. This can be tested with narrow range pH tape, eg, Whatman's tape or Merck indicator strips

- a positive "whiff" test or amine test. A fishy smell is released when the vaginal secretions are mixed with a drop of 10 per cent potassium hydroxide (KOH) on a glass slide, a simple consulting room procedure. (An unpleasant vaginal odour may be more noticeable after sex, as semen is alkaline producing an in vivo "whiff" test)
- characteristic grey-white, homogeneous "flour paste" discharge, which can often be seen on initial inspection, coating the vestibule and labia minora
- "clue" cells on microscopy of wet mount, Gram stain or Papanicolaou stain. The surface of vaginal squamous epithelial cells is covered with small coccobacilli.

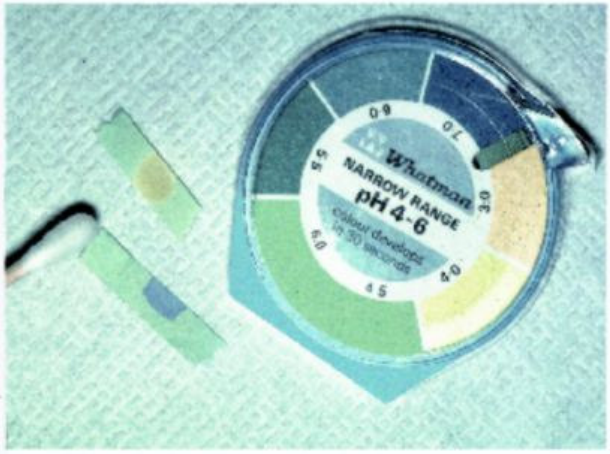

Figure 2. Narrow-range pH tape for testing vaginal pH. The healthy vagina is acidic, between 3.8 and 4.5 (yellow or pale green). An alkaline pH (blue) is found with bacterial vaginosis and trichomoniasis. a sample of the vaginal secretion from the lateral vaginal wall is obtained with a smear spatula or swab

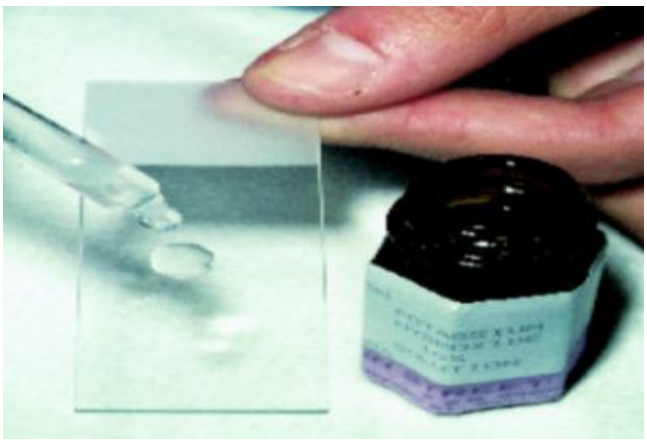

Figure 3. "Whiff" or amine test. A drop of 10% KOH is placed on a glass slide. This is then mixed with a sample of the vaginal secretions. In a positive test there will be an immediate release of fishy amines when the two are mixed

Confirmation can be obtained from a vaginal swab which grows Gardnerella and mixed anaerobes, or from a cervical smear which shows the "clue" cells. The organisms present in BV include G. vaginalis, Mobiluncus and Mycoplasma hominis. The principal anaerobic bacteria are Bacteroides (recently renamed Porphyromonas), Fusobacterium and Peptostreptococcus.
The overgrowth of these vaginal organisms is accompanied by a depletion of the normal hydrogen-peroxide-producing lactobacilli which create a healthy acid environment. Sometimes the condition recurs until lactobacilli are re-established.
BV is not regarded as a sexually transmitted infection but rather as an alteration in the normal flora. Partners do not need to be treated, but if the condition does not respond to initial treatment this may be considered. Within a month, 10 to 15 per cent of treated women will relapse and require further treatment, and 10 per cent of treated women will develop thrush.
BV used to be regarded as a benign condition, but recent research has linked it with the following:

- gynaecological sequelae, including cervicitis, PID, postsurgical infection
- obstetric sequelae, including chorio-amnionitis, late miscarriage, premature rupture of membranes, preterm labour, postpartum endometritis
- paediatric sequelae, including low birth-weight, neonatal infection.

3. Trichomoniasis

Unlike thrush and BV, this is always sexually transmitted. In women symptoms range from an asymptomatic carrier state to an acute infection with intense pruritus, dyspareunia and dysuria. Examination in an acute case may show diffuse vulvar erythema and an increased discharge, yellow-green in colour, frothy and with a fetid odour. The vaginal walls are inflamed and there may be a "strawberry" cervix due to punctate haemorrhages. The pH is alkaline and the "whiff" test (see above) is positive.

A swab should be taken from the pool of secretions in the posterior fornix and sent to the laboratory. If microscopy is available, Trichomonas can be observed as a unicellular flagellated protozoon in a saline wet mount. It does not show in a Gram stain but will be reported in a Papanicolaou stain (cervical smear).
Trichomoniasis is often associated with other STIs, and a full screen should be carried out on the patient and any partners. Unless asymptomatic partners are treated, re-infection can occur. Sometimes resistance to the recommended treatment regimens may be a problem but re-infection should be excluded before referring on.

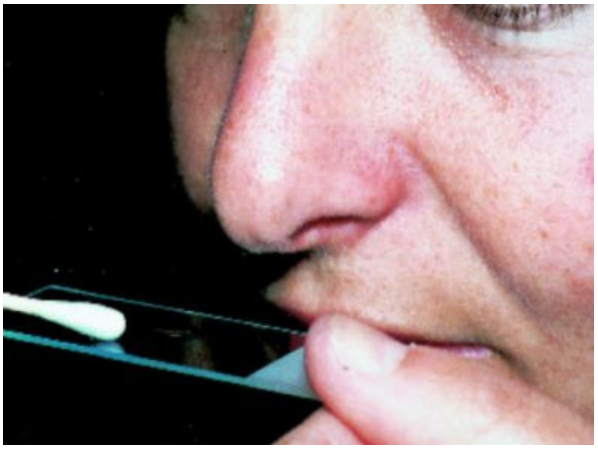

Figure 4. Detecting the release of volatile amines. The mixture of 10% KOH and vaginal secretions is immediately placed under the nose and sniffed. A positive "whiff" test is one of the four crieria for diagnosing bacterial vaginosis

TREATMENT

Thrush

The treatment of thrush has been revolutionised by the development of the imidazole group of antifungals. Most modern treatments belong to this group but nystatin, a polyene (Nilstat, Mycostatin) is still useful when imidazoles have failed, as in some cases of infection with C. glabrata. Oral antifungals such as fluconazole (Diflucan) and itraconazole (Sporanox) are subsidised on the recommendation of a specialist. Some antifungal preparations may cause damage to latex rubber, and this will be important for condom and diaphragm users. Clotrimaderm cream 1 per cent or 2 per cent has been confirmed by laboratory tests to be safe.[3]
A range of medications are available on prescription or over-the-counter, the choice depending in part on patient preference. The length of treatment in acute cases will be determined by the severity of the infection. Single-dose treatments are suitable for prophylaxis or mild cases, but severe infections will require a longer course. Creams are sometimes preferred as they have multiple uses: internal or external treatment for the woman and topical treatment for the partner. It is important to stress, however, that applying a cream to the outside will not treat the source of the infection in the female. Pessaries (vaginal tablets, ovules) are sometimes preferred as being less messy.
If hypersensitivity to candida is suspected, the addition of a mild cortico-steroid cream may be recommended. Reactions to topical preparations may occur, with symptoms worsening after application of the treatment. The sensitivity may be to the vehicle rather than to the antifungal.
Thrush is recurrent in about 40 to 50 per cent of cases, but in only a minority does it become chronic. When it does, it can be frustrating and may cause psychosexual problems. It may be associated with chronic vulval pain (vulvodynia). For chronic thrush, intermittent long term, low-dose (eg, once or twice weekly) topical or oral antifungal therapy is recommended for three to six months. If the history indicates premenstrual or menstrual exacerbations, then prophylactic treatment can be given at this time.
Boric acid is sometimes useful, especially in cases which have not responded to imidazole therapy.[2] Boric acid powder 600mg is made up into vaginal gelatin capsules and inserted once or twice daily for two to four weeks. It can also be used for long term prophylaxis for three to six months.
Patients with recurrent candidiasis often resort to self-help remedies. Among the most popular are acidophilus yoghurt, garlic and diluted Australian tea tree oil (New Zealand manuka) as an external soothing application. A saline bath (two handfuls of kitchen salt in a shallow warm bath) or a saline wash (1 teaspoon of kitchen salt in one pint or 600ml of water) is soothing. Gentian violet is no longer recommended as the dye is potentially carcinogenic. Anti-candida diets excluding refined carbohydrates and yeast products such as breads, wine and mushrooms are sometimes tried.

Bacterial vaginosis

Treatment options include:

- ornidazole (Tiberal) oral tabs 500mg bd for five days (first choice) or 1500mg nocté
- metronidazole (Flagyl, Trichozole) oral tabs 200mg tds for seven days (first choice) or 800mg mané and 1200mg nocté) for two days or 2G stat. Note that recent studies have concluded that metronidazole is safe to use at any stage of pregnancy[4,5]

- tinidazole (Dyzole) oral tabs 500mg, 2G stat
- clindamycin, which requires a specialist endorsement.

Trichomoniasis

Treatment options include:

- metronidazole (Flagyl, Trichozole) tabs 200mg, 400mg. Give 2g as stat dose (first choice). Alternatively tabs 200mg tds for seven days or 800mg mané, 1200mg nocté for 2 days
- ornidazole (Tiberal) tabs 500mg. Give 1500mg as stat dose (first choice). Alternatively tabs 500mg bd for 5 days
- tinidazole (Dyzole) tabs 500mg. Give 2G as stat dose.
  Alcohol should be avoided for 48 hours after treatment with metronidazole and tinidazole.

Other vaginal infections

Streptococcal and staphylococcal infections may require treatment, but only if associated with significant leucocytosis. Desquamative inflammatory vaginitis is a more severe condition which may respond to clindamycin or steroids.[6] More common is a non-specific vaginal infection where no infectious cause can be identified.
Although the presence of lactobacilli usually signifies a healthy vagina, excess lactobacilli are sometimes associated with the condition known as cytolytic vaginosis,[7,8] and abnormally long lactobacilli may cause vaginal lactobacillosis,[9] which has been treated with amoxicillin and clavulanate.

CONCLUSION

While most cases of abnormal vaginal discharge are easily diagnosed and treated in general practice, difficult cases may require specialist referral.

References

1. Milne IK. Fitz-Hugh and Curtis syndrome: a common cause of right upper quadrant pain in young women. *NZ Fam Physician* Summer 1994;3-5.
2. Jovanovic R, Congema E, Nguyen HT. Antifungal agents vs boric acid for treating chronic mycotic vulvovaginitis. *J Reprod Med* 1991;36:593-597.
3. Sparrow M. Update on vaginal products safe to use with latex condoms. *NZ Fam Physician* 2000; 27(4):18.
4. Burtin P, Taddio A, Ariburnu O, et al. Safety of metronidazole in pregnancy: a meta-analysis. Am J Obstetr Gynecol 1995;172(2 Pt 1):525-529.
5. Czeizel AE, Rockenbauer M. A population based case-control teratologic study of oral metronidazole treatment during pregnancy. *Br J Obstetr Gynaecol* 1998;105(3):322-327.
6. Sobel JD. Vulvovaginitis. Dermatol Clinics 1992;10(2):339-359.
7. Cibley LJ, Cibley LJ. Cytolytic vaginosis. *Am J Obstetr Gynecol* 1991; 165:1245-9.
8. Sparrow MJ. Reversal of persistent cytolysis in cervical smears by alkaline douching. *NZ Fam Physician* 2000;27(1):34-36.
9. Horowitz BJ, Mardh P, Nagy E, Rank EL. Vaginal lactobacillosis. *Am J Obstetr Gynecol* 1994; 170:857-861.