

An overview on approach to diagnosis and management of vaginal discharge in gynaecological practice

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Introduction

Vaginal discharge is a distressing and a subjective symptom. A proportion of women are troubled by a discharge which is not profuse whilst others interpret a heavier discharge as normal. Vaginal discharge may be a presenting symptom of a woman who has an underlying psychosexual problem¹. The structures of the female genital tract contributing to vaginal secretions include the uterine cervix, endometrial and tubal mucosa, transudation through vaginal epithelium and Bartholin glands.

At the outset it is pertinent to differentiate a physiological discharge from a pathological vaginal discharge. A physiological vaginal discharge is usually clear, but becomes yellowish on contact with air due to oxidation. The nature of physiological vaginal discharge, depend on factors such as age, phase of menstrual cycle, endogenous and exogenous hormonal influences. In some women an increase amount of blood oestrogen level may cause extension of endo-cervical columnar epithelium to ecto-cervical region to produce cervical ectopy, which in turn produce a troublesome vaginal discharge. If this change continues to remain, it is managed by cryotherapy or electro-cautery to ablate the extended columnar epithelium².

In a new born girl a blood stained vaginal discharge within the first week of life could be evident due to shedding of endometrium in response to withdrawal of maternal oestrogen. Physiological vaginal discharge is an unexpected finding both in childhood, until peri-menarchial period and in post menopausal woman. Nevertheless, post menopausal women may present with vaginal discharge secondary to age related hypo-oestrogenic atrophic changes in genital tract. The commonest cause of vaginal

discharge in reproductive age group is physiological². In reproductive age group, copious amount of thin mucoid vaginal secretions produced in peri-ovulatory phase of menstrual cycle in response to higher oestrogen level. Also, sexual arousal, produce an increase amount of vaginal secretions. A physiological vaginal discharge in sufficient quantity may produce vulvo-vaginal irritation to seek medical help. If a vaginal discharge has become persistent and heavier, purulent, offensive, irritant or blood stained warrants further investigation irrespective of age³. Vaginal discharge in post menopausal women needs extra attention as underlying malignancy of the genital tract could be responsible. The investigation and management of vaginal discharge due to mitotic lesions are beyond the scope of this article. A limited account on management of vaginal discharge due to sexually transmitted infections is included for completeness.

Pathological vaginal discharge and its Management

Pre-pubertal girl

Vaginal discharge is the most common gynaecological complaint in this age group³. Persistent vaginal discharge if associated with irritation is distressing to the child and cause extreme parental anxiety. Vulvo vaginitis is the most common cause for pre pubertal vaginal discharge and can have an infective or a chemical aetiology⁴. Other, less common causes of vaginal discharge include presence of foreign bodies, vulval or vaginal tumours, thread worm infestation, sexual abuse, and congenital anomalies like an ectopic ureter.

Vulvovaginitis:

Causes of vulvo-vaginitis in prepubertal girl:

Infective agents:

- Non specific mixed bacterial flora (most common cause)
- Group A beta Haemolytic streptococcus
- *Haemophilus influenzae*

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- *Candida* sp. (unusual)
- *Trichomonas vaginalis* (acquired from mothers' genital tract at birth, if found in childhood suspect child abuse)

Chemicals and irritants

- soap, bubble bath
- prolonged contact with urine and faeces
- clothing dye, perfume
- sand, dust

Gynaecological examination of the prepubertal girl should be carried out with sensitivity and gentleness. If the child is very young the examination can be carried out keeping the girl on mother's lap. In an older girl, she should lie on the couch with legs in frog-leg position. Gentle separation and retraction of the labia in this posture allows visualization of external genitalia, introitus and hymen. A swab for microbiological study of vaginal discharge could be obtained from the region of posterior fourchette where pooling occur.

The treatment of vulvo vaginitis includes isolation of the specific organisms and use of appropriate antibiotic. However, the mainstay of treatment is good vulval hygiene to prevent disease progression and recurrence⁴. The condition may resolve completely with increasing oestrogenisation of vulvo-vaginal skin at puberty.

Foreign bodies

A foreign body within the vagina acts as a stimulant for vaginal discharge and as a focus for infection. This should be suspected when vaginal discharge cause vulval irritation and keeps recurring after treatment with antibiotics. The presentation of a discharge in presence of a foreign body within the vagina is usually purulent, offensive and blood stained. If a foreign body is suspected, under general anaesthesia, vaginoscopy via an appropriate size nasal speculum is necessary. Retrieval of the foreign body leads to complete resolution of the symptoms.

Reproductive age group

The frequent causes of pathological vaginal discharge in reproductive age group include:

Infections

- | | | |
|-----------------------------|---|--|
| Non sexually transmitted | - | <ul style="list-style-type: none"> <i>Candida</i> sp. Bacterial vaginosis Group B Streptococci (<i>rare</i>) |
| Sexually transmitted | - | <ul style="list-style-type: none"> <i>Chlamydia trachomatis</i> <i>Neisseria gonorrhoea</i> <i>Trichomonas vaginalis</i> <i>Herpes simplex virus</i> (associated cervicitis) |
| Non infective causes | - | <ul style="list-style-type: none"> Tumours Foreign bodies Allergy Fistulae |

The commonest cause of pathological vaginal discharge in this age group is infection⁵. The infections mainly involve the lower genital tract but may extend to upper genital tract and urinary system. From the time of puberty the vaginal pH becomes acidic (<4.5) due to breakdown of glycogen in vaginal epithelium by the dominant commensal lactobacilli. This bacterial organism, also produce bacteriocins and hydrogen peroxide which inhibit the overgrowth of other vaginal organisms. Some commensal organisms such as *Candida* sp. *Saphylococci aureus*, β -haemolytic streptococci, including group B streptococci found in vagina may overgrow to produce an infection with discharge under special circumstances⁵.

Non sexually transmitted infections

Vulvo-vaginal candidiasis (VVC)

Infection with *Candida* requires a disturbance of the local or systemic immunity. The predisposing factors for VVC include, pregnancy, use of broad spectrum antibiotics, trauma to vaginal skin, diabetes mellitus, and conditions impairing cell mediated immunity. There is no good evidence that currently used hormonal contraception increases the risk of VVC. The life time incidence of VVC is 50-75%. Around 50% women who have had an acute attack will have a further attack. The commonest species to cause VVC is *Candida albicans* (90% of cases). The other *Candida* species isolated in VVC are, *Candida glabrata*, *C. krusei*, and *C. tropicalis*. Occasionally non candidal yeast species such as *Torulopsis glabrata* and Trichophyton species may also be responsible for symptoms. Consequently, identification of the species of yeast is important in women who appear to have infection refractory to treatment. The symptoms of VVC are not in proportion to infection burden. Never-

theless, with heavy infection burden, standard dose treatment may fail. The symptoms may vary from mild itch to extremely distressing pruritus with excoriation. The vaginal discharge may be thin and mucopurulent or thick white curd appearance. Findings in VVC are typically of an adherent white discharge in patches with erythema of the tissues and vulval oedema. It is important not to rely solely on clinical features to diagnose VVC especially when refractory to treatment or recurrences of symptoms occur⁷. The rapid diagnosis of VVC is made by microscopic examination of the vaginal discharge, on saline or potassium hydroxide wet mount or a Gram-stained preparation. The culture of a high vaginal swab in Sabouraud's media will make an accurate diagnosis possible to species level. Determination of vaginal pH using narrow range pH paper can also assist the diagnosis of Candida infection from Trichomonas and bacterial vaginosis. The vaginal pH remains normal in presence of Candida infection, but becomes above 4.5 in presence of Trichomonas or bacterial vaginosis.

Underlying causes predisposing to VVC should be identified and if possible should be treated. Routine screening and treatment of male sexual partner is not recommended. The pharmacological treatment of VVC is summarized in the table below^{3,5,6}.

Vaginal regimens	<p>Clotrimazole pessary-single 500mg, or 200mg nightly for 3 days or 100mg nightly for 6 days.</p> <p>Econazole pessary single 150mg dose or 150mg nightly dose for 3 days,</p> <p>Miconazole intravaginal cream (2%) 5g applicator nightly for 10-14 days. Can apply to anogenital/vulval region.</p> <p>Non albican species - The first line treatment is Nystatin pessaries 100,000 units, once nightly for 14 days.</p>
Oral regimens	<p>Flucanazole capsule 150mg single dose or Itraconazole capsule 200mg twice daily for 1 day.</p>

Recurrent infection should be treated with an above mentioned treatment regime and maintenance regimen of oral flucanazole 100 mg single weekly dose for 6 months or oral itraconazole 400 mg (two divided doses in single day monthly for 6 months). If the

woman prefers a vaginal preparation a single clotrimazole 500 mg pessary weekly for 6 months is recommended. In pregnancy treatment is with topical azoles as above, but longer regimens up to 7 days may be needed. Oral azole derivatives are avoided due to potential teratogenicity.

There is good clinical evidence to show that the intestinal and urogenital microbial flora have a central role in maintaining both the health and wellbeing of humans. Furthermore, the use of "good bacteria" to replace or augment bacterial populations is gradually achieving scientific acceptance in management of VVC and bacterial vaginosis. This application is termed probiotics^{8,9}.

Bacterial vaginosis (BV)

BV is the commonest cause of infective vaginal discharge^{10,11}. The normally predominant lactobacilli are replaced in BV mainly with *Gardnerella vaginalis* and also with Mobiluncus species, Mycoplasma sp, Prevotella sp, Urea plasma species, bacteroides and other anaerobes. It is not clear what precipitate BV. Nevertheless, it can occur and remit spontaneously. Women who have recurrent episodes of BV should be advised to avoid douching and use of soaps and detergents in the genital areas as it may eradicate lactobacilli and favours the vaginal pH >4.5 to predispose to BV. Other contributing factors to alter vaginal pH include exposure to semen and menstrual blood.

Classically BV presents with grayish white homogenous non purulent vaginal discharge. It emits a fishy odour. The discharge coats the vagina and vestibule, itching is not a feature of BV. The diagnosis is confirmed by examining the discharge obtained from vaginal fornices. If three (3) of the following criteria (Amsel's criteria) are fulfilled the diagnosis of BV is made.

Amsel's Criteria:

1. Greyish white homogenous discharge
2. pH >4.5
3. Fishy odour (on addition of 10% KOH)
4. Presence of clue cells under microscopy - (Denuded vaginal epithelial cells studded with bacteria)

Prevalence of BV is higher in women with pelvic inflammatory disease. BV is associated with endometritis following termination of pregnancy. In pregnancy BV may contribute to miscarriage, preterm labour, premature rupture of membranes and post partum endometritis.

Symptomatic women with BV are offered treatment. Routine screening and treatment of male partner is not recommended¹².

Treatment of BV is summarized in the table below:

Oral regimens	Metranidazole 400 mg bd, for 5 to 7 days. Metranidazole 2 g stat dose. Tinidazole 2 g stat dose.
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Sexually transmitted infections

Trichomonas vaginalis (TV)

TV is a flagellated protozoan, transmitted sexually and mainly causes vaginitis. In women the organism is found in vagina, urethra and paraurethral glands. In 5% of females with TV, the urethra is the sole site of infection. It is estimated that 10-50% of women with TV are asymptomatic. The common symptoms of TV include vulval itch, yellowish green frothy vaginal discharge with an offensive odour, and dysuria. Occasionally may complaint of lower abdominal discomfort. The finding of a "strawberry cervix" on speculum examination is seen to naked eye in 2% of cases. TV infection may enhance HIV transmission¹³. The complications of TV associated with pregnancy are, pre term labour, low birth weight and new born girl acquiring the infection. The direct microscopic observation of flagellate protozoan by wet mount freshly obtained from posterior vaginal fornix allows diagnosis. Recent studies also support examination of self obtained vaginal swabs with equal results¹⁴. Culture techniques are still considered the gold standard test to identify TV. Since lately PCR based diagnostic tests with 100% sensitivity and specificity have been achieved. In presence of TV it is important to screen for other sexually transmitted infections in the female and her sexual partners.

The principles of treatment include giving advice on avoiding sexual intercourse until treatment of patient and her partners are completed. Most strains of TV are highly susceptible to nitroimidazoles. The single dose regimen has the advantage of compliance and cost, however, failure rate may be higher in comparison to a longer duration course if the sexual partner is not treated simultaneously. There is no report of teratogenicity due to exposure to metranidazole in first trimester of pregnancy. Metranidazole given as high dose can enter breast milk to produce a metallic taste.

Treatment of TV is summarized in the table below^{3,5}

Oral regimens	Metranidazole 400 mg bd, for 5 to 7 days. Metranidazole 2 g stat dose. Tinidazole 2 g stat dose. <i>Vomiting is a major problem with metranidazole. Avoid alcohol for the duration of treatment and 3 days after. Avoid single high dose regimens if breast feeding</i>
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Patients who fail to respond to above regimen often answers to a repeat course of standard treatment. The reasons of treatment failure include poor compliance with medication and or re-infection. Treatment of patient's refractory to nitroimidazole is a therapeutic challenge. Sensitivity testing for TV is yet not available. It has been suggested that microbes present in vagina may interfere with action of nitroimidazole against TV. To overcome this, prior treatment with a broad spectrum antibiotic may be beneficial.

Neisseria gonorrhoea (NG)

NG is a gram negative intracellular diplococcus which may infect the cervix, urethra, rectum, or pharynx, provided the mentioned sites have been exposed. Up to 50% of women with NG will complain of mucopurulent vaginal discharge. It is mainly due to cervicitis. *N. gonorrhoea* may co-exist with other genital tract pathogens such as TV, Candida, and *Chlamydia trachomatis*. The diagnosis of *Neisseria gonorrhoea* is made by obtaining culture swabs from site of infection. To diagnose female genital tract GC infection an endocervical swab is taken for culture or nucleic acid amplification test. The diagnostic yield is increased by taking an additional swab from the urethra.

Recommended treatments¹⁵

Uncomplicated anogenital infection in adults:

- Ceftriaxone 250 mg IM as a single dose.
or
- Cefixime 400 mg oral as a single dose.
or
- Spectinomycin 2 g IM as a single dose.

Alternative regimens – may be used when an infection is known to be sensitive to these antimicrobials or where the regional prevalence of resistance to them is less than 5%:

- Ciprofloxacin 500 mg orally as a single dose.
or
- Ofloxacin 400 mg orally as a single dose.
or
- Ampicillin 2 g or 3 g plus probenecid* 1 g orally as a single dose,
- Other single dose cephalosporin regimes, notably Cefotaxime 500 mg IM as a single dose.
or Cefoxitin 2g IM as a single dose plus probenecid* 1g oral.

Chlamydia trachomatis (CT)

Genital chlamydial infection remains asymptomatic in at least 70% of women and the majority of infections probably clear spontaneously without morbidity¹⁶. Genital chlamydial infection can cause significant short and long term morbidity with accompanying costs to the individual and the health service¹⁷. The complications of chlamydial infection include, pelvic inflammatory disease (PID), ectopic pregnancy and tubal infertility in women, epididymo-orchitis in men, and reactive arthritis. Women diagnosed with chlamydial infection may suffer anxiety and psychological distress.

The symptoms of chlamydial infection include increased vaginal discharge, post-coital and/or intermenstrual bleeding, lower abdominal pain and dysuria. Signs include a mucopurulent cervical discharge, cervical friability and adnexal tenderness on vaginal examination. Testing for Chlamydia should be performed in women with above mentioned clinical features. Routine use of culture to diagnose Chlamydia infection is not recommended due to high cost and low sensitivity. The enzyme immune-assays too carry a sensitivity of about 60%. Nevertheless, Nucleic acid amplification tests (NAAT) are 90-95% sensitive in detection of the infection. A cervical swab needs to be obtained from the endo-cervical canal at speculum examination of the cervix for NAAT¹⁸. Patients should be advised to avoid sexual intercourse (including oral sex) until they and their partner(s) have completed treatment (or wait 7 days if treated with Azithromycin).

Recommended treatment regimens^{3,5}

- Doxycycline 100 mg bd for 7 days (contraindicated in pregnancy)
or
- Azithromycin 1 gm orally in a single dose

Alternative regimens

For use if either of the above treatments are contraindicated.

- Erythromycin 500 mg bd for 10-14 days
or
- Ofloxacin 200 mg bd or 400 mg once a day for 7 days

Vaginal discharge is a common presenting symptom encountered by doctors in many services (primary care, gynaecology, family planning, and departments of genitourinary medicine). Vaginal discharge may be physiological or pathological. Although abnormal vaginal discharge often prompts practitioners to screen for sexually transmitted infections, vaginal discharge is poorly predictive of the presence of an STI. This article focused on the causes and diagnosis of vaginal discharge and treatment of the most common infective causes.

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