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**The lower genital tract infection**

*Objectives*

To know Classification , Anatomy and physiology of genital tract infection:-

* -To understand the definition of the vulvitis, vaginitis- vaginal infection, cervicitis
* - To understand how to approach to diagnosis in patients with vaginal discharge.

*-*Is one of the very common diseases in women and is the most common in women at the age of sexual activities.

 **Classification of genital tract infection:**

Depending on the site and affection of the infective organism

* 1. Lower genital tract infections: - vulvitis, vaginitis, cervicitis.
* 2. Upper genital tract infection:- (Pelvic Inflammatory Disease).
* **The normal vagina:**
* Normal vaginal secretions are composed of vulvar secretions from sebaceous, sweat,Bartholin, and Skene glands; transudate from the vaginal wall; exfoliated vaginal andcervical cells; cervical mucus; endometrial and oviductal fluids; and micro-organisms andtheir metabolic products mainly bacteria(lactobacillius). Floccular in consistency, white in color , and usually located in the dependent portion of the vagina (posterior fornix),
* May increase in the middle of the menstrual cyclebecause of an increase in the amount of cervical mucus. These cyclic variations do notoccur when oral contraceptives are used and ovulation does not occur.
* **-**The normal vaginal flora is mostly aerobic, with an average of six different species of bacteria, the most common of which is hydrogen peroxide producing lactobacilli.
* **-**The microbiology of the vagina is determined by factors that affect the ability of bacteria to survive . These factors include vaginal pH and the availability of glucose for bacterial metabolism. The pH level of the normal vagina is lower than 4.5, which is maintained by the production of lactic acid.
* **-**The vaginal epithelium is lined by stratified squamous epithelium during the reproductive age group under the influence of the estrogen.
* **Vaginitis- vaginal infection:**Symptomatic vaginal discharge most often reflects BV, candidiasis, or trichomoniasis
* **1. Bacterial Vaginosis:**
* -It is common condition characterized by the presence of foul smelling discharge without obvious inflammation.
* - Previously known as nonspecific vaginitis or *Gardnella* vaginitis.
* In women with BV, however, the concentration of anaerobes, and G. vaginalis and
* Mycoplasma hominis, , Bacteroids spp. is 100 to 1,000 times higher than in normal women and Lactobacilli are usually absent causing increasing in vaginal pH making it more alkaline.
* **-Aetiology and risk factors:** repeated alkalinization of the vagina is the major cause, which occur with:
* 1.frequent sexual intercourse.
* 2.early age of sexual intercourse.
* 3. sex during menses.
* 4.douching.
* 5.Intrauterine device.
* **Adveres effects:** women with BV are at increased risk for:
* **1.**Pelvic inflammatory disease (PID).
* **2.**Postabortal PID.
* **3.**Pregnant women with BV are at risk for premature rupture of the membranes preterm labor and delivery chorioamnionitis, and postcesarean endometritis .
* In women with BV who are undergoing surgical abortion or hysterectomy, perioperative treatment with metronidazole eliminates this increased risk.
* - **Sign and symptoms**:
* - A fishy vaginal odor, which is particularly noticeable following coitus, and menstruation.
* - Vaginal secretions are creamy or gray and thinly coat the vaginal walls.
* -Asymptomatic carriers.
* **Diagnostic features:**
* **Amsel criteria:**
* -A fishy vaginal odour on addition of alkali.
* - Creamy grayish white discharge and thinly coat the vaginal walls.
* - Vaginal pH is higher than 4.5.
* -The finding of both clue cells and a positive whiff test is pathognomonic, even in asymptomatic patients.
* -Clinicians who are unable to perform microscopy should use alternative diagnostic tests such as a pH and amines test card, detection of G. vaginalis ribosomal RNA, or Gram stain.
* -Culture of G. vaginalis is not recommended as a diagnostic tool because of its lack of specificity.
* **Treatment:**
* Ideally, treatment of BV should inhibit anaerobes but not vaginal lactobacilli.
* 1.**Metronidazole:**
* excellent activity against anaerobes, is the drug of choice, dose of 500 mg administered orally twice a day for 7 days should be used or gel, 0.75%, one applicator (5 g) intravaginally once or twice daily for 5 days, may also be prescribed.
* 2.**Clindamycin**: 300 mg, orally twice daily for 7 days, orcream, 2%, one applicator full (5 g) intravaginally at bedtime for 7 days.
* Many clinicians prefer intravaginal treatment to avoid systemic side effects such as mild to moderate gastrointestinal upset and unpleasant taste.
* Treatment of the male sexual partner does not improve therapeutic response- and therefore is not recommended.
* **2.Trichomonas Vaginitis**:
* -Is most common curable STD caused by flagellated parasite, (Trichomonas vaginalis) and can cause sever vulvovaginites. The transmission rate is high; 70% of men contract the disease after a single exposure to an infected woman, which suggests that the rate of male-to-female transmission is even higher.
* It often accompanies BV, which can be diagnosed in as many as 60% of patients with trichomonas vaginitis
* Recurrence is common if male is not treated simultaneously.
* **Signs and symptoms:**
* -Vulval soreness and itching.
* -Foul smell vaginal discharge, sometimes frothy yellowish green in nature.
* -Dysuria, and abdominal discomfort.
* -In patients with high concentrations of organisms, a patchy vaginal erythema and colpitis macularis (“strawberry” cervix) may be observed.
* - hemorrhages.
* -Asymptomatic carriers.
* - Men with trichomoniasis may feel itching or irritation inside the penis, burning after urination or ejaculation, or some discharge from the penis.
* **Diagnosis:**
* -The pH of the vaginal is usually higher than 5.0.
* -Wet mount test reveals motile trichomonads with typical flagellae, and increased numbers of leukocytes. Clue cells may be present because of the common association with BV.
* -The whiff test may be positive.
* -Morbidity associated with trichomonal vaginitis may be related to BV. Patients with trichomonas vaginitis are at increased risk for postoperative cuff cellulitis following hysterectomy.
* -Pregnant women with trichomonas vaginitis are at increase risk for premature rupture of the membranes and preterm delivery
* **Treatment:**
* - partners should be treated and screened for other STI.
* -Metronidazole is the drug of choice for treatment in a single-dose (2 g orally) and a multidose (500 mg twice daily for 7 days) regimen are highly effective and have cure rates of about 95%
* -Tinidazole, 2 g, in a single dose of 2 g for 5 days is equally effective.
* -Treatment failure- routine administration changed (rectal rather than oral) or higher doses is given.In these uncommon refractory cases, an important part of management is to obtain cultures of the parasite to determine its susceptibility to metronidazole and tinidazole.
* **3.Vulvovaginal candidiasis:**
* -Is one of the most common genital infections , is caused by [*Candida albicans*](http://www.dermnetnz.org/fungal/candida.html) in the vagina in around 80-90%.
* -Other species of *Candida*, such as *C. glabrata* and *C. tropicalis*, can cause vulvovaginal symptoms and tend to be resistant to therapy.
* -Overgrowth of *Candida albicans* occurs most commonly with: Pregnancy , Higher dose Occp and oestrogen-based hormone replacement therapy, a course of broad spectrum antibiotics such as [tetracycline](http://www.dermnetnz.org/treatments/tetracycline.html) or amoxiclav, [Diabetes mellitus](http://www.dermnetnz.org/systemic/diabetes.html) ,[Iron deficiency anaemia](http://www.dermnetnz.org/systemic/iron-deficiency.html) , [Immunodeficiency](http://www.dermnetnz.org/immune/immunodeficiency.html) e.g., [HIV infection](http://www.dermnetnz.org/viral/human-immunodeficiency-virus.html)
* **Signs and Symptoms :**
* -Heavy white curd-like vaginal discharge
* -The discharge can vary from watery to homogeneously thick.
* -Vaginal soreness, dyspareunia, vulvar burning, and irritation may be present.External dysuria (“splash dysuria) may occur when micturition leads to exposure of the inflamed vulvar and vestibular epithelium to urine.
* - Examination reveals erythema and edema of the labia and vulvar skin. Discrete pustulopapular peripheral lesions may be present. The vagina may be erythematous with an adherent, whitish discharge. The cervix appears normal.
* **Classification of Vulvovaginal Candidiasis**
* **Uncomplicated Complicated**
* Sporadic or infrequent in occurrence Recurrent symptoms
* Mild to moderate symptoms Severe symptoms
* Likely to be Candida albicans Non-albicans Candida
* Immunocompetent women Immunocompromised, e.g., diabetic women
* **Diagnosis:**
* -The pH of the vagina is usually normal (s1<4.5).
* -The results of saline preparation of the vaginal secretions usually are normal, Fungal elements, either budding yeast forms or mycelia, appear in as many as 80%of cases.
* -The whiff test is negative.
* -A fungal culture is recommended to confirm the diagnosis.
* **Treatment:**
* 1.**Topically** applied azole drugs are the most commonly available treatment for VVC, Symptoms usually resolve in 2 to 3 days *like* Clotrimazole1% cream, 5g intravaginally for 7–14 days *or* 100-mg vaginal tablet for 7 days*.*
* 2**. An oral fluconazole**, used in a single 150-mg dose have equal efficacy.
* 3. **Complicated VVC**( in pregnancy , diabetes, immunecompromizied) : an additional 150-mg dose of fluconazole given 72 hours after the first dose, or can be treated with a more prolonged topical regimen lasting 10 to 14 days. Adjunctive treatment with a weak topical steroid, such as 1%hydrocortisone cream, may be helpful in relieving some of the external irritative symptoms
* 4. **Recurrent Vulvovaginal Candidiasis**- defined as four or more episodes in a year, presents persistent irritative symptoms , Burning replaces itching as the prominent symptom in patients with RVVC.
* -Treatment with fluconazole (150 mg every 3 days for 3 doses), then maintained on a suppressive dose of fluconazole, 150 mg weekly for
* 6months. 90% will remain in remission.
* -Many women with RVVC presume incorrectly they have a chronic yeast infection. Many of these patients have chronic atopic dermatitis or atrophic vulvovaginitis.



**Cervicitis :**

-is inflammation of the cervix, which can be due to irritation, infection,

injury of cells that line the cervix,these cells may become red, swollen, and ooze mucus and pus, they may also bleed easily when touched.

**Aetiology:**

1- usually caused by infections that are passed during sexual activity, Gonorrhea, Chlamydia,Genital herpes, trichomoniasis

2-Allergies to chemicals in spermicides, douches, or to the latex rubber in [condoms](http://www.webmd.com/sex/birth-control/birth-control-condoms).

3-Irritation or injury from tampons, pessaries, or from [birth control](http://www.webmd.com/sex/birth-control/) devices like diaphragms

4-Hormonal imbalance; having relatively low estrogen or high progesterone may interfere with the body's ability to maintain healthy cervical tissue.

Endocervical infection is commonly by:

**1. Neisseria gonorrhoea endocervicitis**: is sexually transmitted disease, caused by neisseria gonorrhoea, gram –ve diplococcus, has high affinity to infect cuboidal and columner epitheliumin cervix and urethra.

**Signs and symptoms:**

-Asymptomatic

-Increased vaginal discharge with lower abdominal pain

-Dysuria with urethral discharge.

-Proctitis with rectal bleeding , duscharge , and pain.

-Endocervical mucopurulant discharge and contact bleeding.

- mucopurulant urethral discharge.

-Pelvic tenderness with cervical excitation.

**Diagnostic tests:**

-Gram staining-visualization of g-ve intracellular diplococcus( small cotton swab is placed into the endocervical canal ).

-Culture medium using agar medium containing antimicrobial to reduce growth of other organism.

-Nucleic acid amplification tests.

- Nucleic acid hybridization tests.

**Treatment:**

-*Cefixime*, 400 mg orally (single dose), *or Ceftriaxone*, 250 mg intramuscularly (single dose), *or Ciprofloxacin*, 500 mg orally (single dose)*.*

**2.Chlamydia trachomatis endocervicitis:**

-Is one of the most common STI, caused by an obligate intracellular bacteria Chlamydia, affecting columner epithelium of the genital tract.

-Majority is asymptomatic with slow insidious onset.

There are several serovars of Chlamydia :D-k infect the GUT.

**Signs and symptoms:**

-Asymptomatic.

-Vaginal discharge and lower abdominal pain.

-Poscoital bleeding.

-Intermenstrual bleeding/

-Mucoprulant cervical discharge with contact bleeding.

-Dysuria with urethral discharge.

**Complications:**

-Pelvic inflammatory disease.

-Perihepatitis: Fitz-Hugh \_Curtis syndrome.

-Neonatal conjunctivitis, and pneumonia.

-Reiter's syndrome, reactive arthritis.

**Diagnostic tests:**

1.Nuclic acid amplification test->90% sensitive, repeated twice to improve specifity of the test.

2.Culture is expensive with limited availability, not routinely recommended.

**Treatment:**

*Azithromycin*, 1 g orally (single dose), *or Doxycycline*, 100 mg orally twice daily for 7 days, *or Ofloxacin*, 300 mg orally twice daily for 7 days

Cervicitis is commonly associated with BV, which, if not treated concurrently, leads to significant persistence of the symptoms and signs of cervicitis.