**Lower genital tract infections and STDs**

* **Normal vagina :**
  1. Lined by stratified squamous epithelium .
  2. Flora is mostly Aerobic , and most common is hydrogen peroxide-producing Lactobacilli (gram +ve rods).
  3. PH (3.8-4.2) , this is because estrogen-stimulated vaginal epithelium is rich in glycogen , and this glycogen will be broken down by vaginal epithelium into monosaccharides which will be converted into glucose , and lactobacilli “Doderlein’s bacillus” will use this glucose to make lactic acid that maintain normal vaginal PH .
  4. Secretions : clear , odorless , floccular (زي الصوف) in consistency , usually located in most dependant part of vagina (posterior fornix) , these secretions are normally composed of >> vulvar secretions from sebaceous, sweat, Bartholin and skene glands, transudate from the vaginal wall, exfoliated vaginal & cervical cells, cervical mucus,, endometrial & oviductal fluids.
* **Analysis of vaginal secretions :**
  1. Wet mount preparations :
     + Put vaginal secretions in 0.5 ml Normal Saline , and put it on a slide then cover it with a slip and put it under microscope .
     + Normal findings >> superficial epithelial cells, few WBCs, few clue cells and some lactobacilli .
     + “clue cells” : superficial vaginal epithelial cells with adherent bacteria, usually G.vaginalis, which obliterates the crisp cell border when visualized microscopically.
  2. Gram stain :
     + Normally we see gram +ve rods (lactobacilli)
* **Types of lesions :** 
  1. Vaginitis
  2. Ulcertive lesions
  3. vulval infections
  4. cervicitis
     1. **Vaginitis :**
  + characterized by pruritus, vaginal discharge and/or vulvar itching & irritation, foul vaginal odor & superficial dyspareunia.
  + Disease associated with vaginitis :
    1. Bacterial vaginosis “most common”
    2. Trichomoniasis
    3. Candidiasis

1. Bacterial vaginosis : (Most common vaginitis)

* + previously known as “nonspecific vaginitis” or “Gardnella Vaginitis” .
  + Not an STD .
  + caused by Alteration of normal vaginal bacterial flora that results in the loss of hydrogen peroxide producing lactobacilli and an overgrowth of predominantly anaerobic bacteria (G. vaginalis & Mycoplasma hominis).
  + repeated alkalinization of the vagina which occurs with frequent sexual intercourse or use of douches plays a role.
  + Recurrence is common (because After disappearance of lactobacilli, It s difficult to reestablish normal vaginal flora).
  + characterized by homogenous milky or creamy (white to gray) discharge that smoothly & thinly coats the vaginal walls.
  + Diagnosis : (Amsel criteria )
    1. Fishy vaginal odor, that is particularly noticeable following coitus & vaginal discharge present.
    2. The PH of the secretions is >4.5 (usually 4.7-5.7).
    3. On microscope >> increased number of clue cells, no WBCs (no inflammation ) and no lactobacilli .In advanced cases, >20% of the eipthelial cells are clue cells .
    4. No itching (because there is no inflammation ).
    5. Whiff test >> adding 10% KOH to secretions will release fishy amine-like odor .
    6. Gram stain >> gram –ve or gram-variable rods and cocci and curved Gram –negative rods .
    7. Culture of G.Vaginalis is not recommended as a diagonstic tool because it is not specific .
  + Treatment :
    - Non-pregnant recommended Regimens >>

1- Metronidazole 500 mg orally twice a day for 7 days.

2- Metronidazole gel, 0.75%, one full applicator (5 g) intravaginally, once a day for 5 days

3- Clindamycin cream, 2%, one full applicator (5 g) Intravaginally at bedtime for 7 days.

4- Clindamycin 300mg, orally twice daily for 7 days.

5- Clindamycin ovules, 100mg, intravaginally once at bedtime for 3 days

* + - Pregnant >>

metronidazole 250mg \*3 for 7 days (better to be avoided in first trimester)

* + - No need to treat husband .
    - Vaginal route better than oral to avoid systemis side effects (GI upset , unpleasant taste )

2. Trichomonas Vaginitis :

* + It is an STD .
  + Caused by “Trichomonas Vaginalis”, a flagellated parasite .
  + In 60% of cases it accompanies BV .
  + T.Vaginitis is an anaerobe that has the ability to generate hydrogen to combine with oxygen to create an anaerobic environment .
  + Symptoms & signs >>
    - 50% asymptomatic .
    - Symptoms can be worse during pregnancy or right before or after a menstrual period .
    - Principle symptoms :
      1. Persistent vaginal discharge (profuse, extremely frothy, greenish, foul smelling).
      2. Vaginal itching, irritation, pain and superficial dyspareunia.
      3. External dysuria (when urine touches inflamed tissue )
  + Examination >>
    - Generalized vaginal erythema with multiple small petechiae “Angry looking vagina”.
    - Strawberry cervix (Patchy redness of the genitals, including labia and vagina with colpitis macularis ) .
  + Diagnosis >>
    1. Microscopy of the secretions : no lactobacilli, increased WBCs, Clue cells if associated with BV, and motile flagellated trichomonas.
    2. +ve whiff test if associated with BV .
    3. PH of secretions > 5 .
    4. Culture “most sensitive and specific method”
  + Morbidity :
    - Increased risk of premature rupture of the membranes and preterm delivery .
    - Increased risk of post operative cuff (vaginal folds) cellulitis following hysterectomy .
    - Should be screened for other STDs (N. gonorrhea , chlamydia trachomatis,syphilis and HIV)
  + Treatment :
    - Metronidazole 2 g orally in a single dose OR
    - Tinidazole 2 g orally in a single dose.
    - Alternative Regimen Metronidazole 500 mg orally twice a day for 7 days.
    - Husband must be treated , and avoid intercourse until symptoms in male and female resolve .

3. Vulvovaginal Candidiasis :

* + Most common cause “Candida Albicans” 85-90%.
  + If recurrent and resistant to treatment think of other species of candida (C. Glabrata , C. Tropicalis).
  + Candida are dimorphic fungi existing as blastospores .
  + Symptoms >>
    1. Vaginal discharge (vary from watery to homogenously thick that typically resembles cottage cheese).
    2. Vulvar pruritis (mainly at night), vaginal soreness, dyspareunia, vulvar burning and irritation may be present.
    3. External dysuria (splash dysuria) .
  + Examination >>
    - erythema & edema of the vulvar skin and labia. Discrete pustulopapular peripheral lesions may be present.
    - The vagina may be erythematous with an adherent, whitish discharge.
    - The cervix appears normal
  + Diagnosis :
    1. The PH of the vagina in patients with VVC is usually normal <4.5.
    2. The Whiff test is –ve .
    3. Wet mount preparation of secretions usually are normal (lactobacilli ,yeast buds ,WBCs ,no clue cells) although there may be a slight increase in the number of inflammatory cells in severe cases. Fungal elements (mycelia or budding yeast) appear in 80% of cases.
    4. Fungal culture is recommended to confirm the diagnosis in case of +ve findings on examination but microscopy is -ve where presumptive diagnosis can be made.
  + Classification :

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| **Uncomplicated** | **Complicated** |
| Sporadic or infrequent in occurrence | Recurrent symptoms |
| Mild to moderate symptoms | Severe symptoms |
| Likely to be C.albicans | Non albicans Candida |
| Immunocompetent women | Immunocompromised women ( DM, immunosuppression) |

* + Treatment :
* topically applied azole drugs are more effective than nystatin .
* Intravaginal Agents:   
  Butoconazole 2% cream 5 g intravaginally for 3 days OR

Clotrimazole 1% cream 5 g intravaginally for 7–14 days OR

Clotrimazole 100 mg vaginal tablet for 7 days OR  
 Miconazole 2% cream 5 g intravaginally for 7 days, 200mg vaginal supp for 7 days “mostly used” .

* Oral Agent: Fluconazole 150 mg oral tablet, one tablet in single dose for uncomplicated VVC .
* complicated VVC >> additional 150mg dose of fluconazole given 72 hours after the first dose.

**B. Infections of vulva:**

1- Genital warts :

* + Caused by non-oncogenic types of Human Papilloma virus (HPV) , mainly type “6 & 11” .
  + Soft , sessile (no pedicle), and or verrucous (ثؤلولي) lesions.
  + Tend to occur in areas most directly affected by coitus, namely the posterior fourchette and lateral areas on the vulva. Less frequently can be found throughout the vulva, in the vagina and on the cervix .
  + External genital warts are highly contagious >75%.
  + Diagnosed clinically.
    - Could be asymptomatic, or bleed and painful .
  + Treatment goals >>
    - Remove warts (it is not possible to eradicate the viral infection).
    - More successful in patients with small warts that have been present for less than one year .
  + Treatment >>
    - Application of cytotoxic or keratolytic agents , surgical excision ,cytodestructive techniques & immune modulators, cryotherapy , laser.

2- Molluscum contagiousum :

* + Caused by POX virus infection.
  + Spread by skin contact , autoinoculation (Someone with molluscum can spread it to other parts of their body by touching or scratching a lesion and then touching their body somewhere else. Shaving and electrolysis can also spread mollusca to other parts of the body , might be spread by sharing swimming pools, baths), fomites (inanimate objects that can become contaminated with virus e.g linens such as clothing and towels, bathing sponges, pool equipment, and toys).
  + Appearance of dome shaped papules with central umbilication , 2-5 mm diameter.
  + Usually asymptomatic but may be pruritic & become inflammed & swollen .
  + It is usually self limited.
  + cannot spread through coughing or sneezing (because virus remains in the top layer of skin (epidermis) and does not circulate throughout the body)
  + Molluscum contagiosum is not like herpes viruses, which can remain dormant ("sleeping") in your body for long periods and then reappear (Since the virus lives only in the top layer of skin, once the lesions are gone the virus is gone and you cannot spread it to others)
  + Treatment >>
    - same as genital warts .
    - Each lesion must be treated individually as the therapeutic effect is localized.
    - Treatment recommended for genital types .

**C. Genital ulcers:**

* + 1. Genital herpes (Most common cause):
* HSV – 1 Mostly oro-labial, but increasing cause of genital herpes ,HSV – 2 Almost entirely genital > 95% of recurrent genital lesions.
* Horizontal Transmission , Intimate sexual contact (oral/genital) , Aerosol and fomite transmission is rare , Vertical Transmission , Maternal-infant via infected cervico-vaginal secretions, blood or amniotic fluid at birth , Autoinoculation , From one site to another
* grouped vesicles mixed with small ulcers with a history of similar lesions (Pathognomonic).
* Vesicles that will rupture leaving multiple shallow painful ulcer , with regional lymphadenopathy .
* Symptoms >> pain , superficial dyspareunia , discharge and itching .
* Diagnosis >> culture (Viral isolation) , or Direct detection of virus (Tzcank smears, PCR)
* Treatment >> 1st episode is treated with acyclovir (200mg 5 times a day for 7 days) , famciclovir, this will not eradicate the infection, recurrences are common. For patients with > 6 recurrences/year → daily suppressive treatment is indicated (will not eliminate viral shedding and transmission)

* + 1. Chancre (syphilis):
* Syphilis Caused by T. pallidum (spirochete bacteria) spiral-shaped, Gram-negative, highly mobile bacterium, Transmitted through contact with chancre , condyloma lata or mucosal lesion. Primary , secondary , tertiary syphilis stages occur over years to decades , with periods of inactive or latent disease. Primary syphilis presents as hard , painless , solitary chancre (mostly in 1ry syphlis) .
* Symptoms >> Painless, minimally tender ulcer, accompanied by non tender inguinal lymphadenopathy (LAP). Regional adenopathy normally accompanies the chancre of primary syphilis
* Diagnosis >> dark-field microscopy , VDRL or RPR , FTA-ABS
* Treatment >> Benzathine Penicillin G 2.4 million units IM x1 dose (starts to heal after 2 weeks of Tx , and ulcer resolve after 6-8 weeks ).
* These patients may have reaction to antibiotic (Headache , myalgia , fever )which is called “Jarisch-Herxheimer reaction”
  + 1. Chancroid :
* Caused by Hemophilus ducreyi (**Haemophilus ducreyi** is a fastidious gram-negative coccobacillus bacteria), Lesion starts as multiple vesicopustules over vulva , vagina & cervix . then sloughs to form shallow irregular ulcers. Lesion painful , tender with foul smelling purulent & hemorrhagic discharge may be present.
* Symptoms >> 1-3 extremely painful ulcers with tender inguinal LAP (Lymphadenitis occurs in approximately 30% of the cases. The lymphadenopathy is regional and is often unilateral (generally on the same side as the lesion))
* Diagnosis >> culture for H.ducreyi (The bacteria are often seen in short chains or parallel arrays (‘school-of-fish’ or ‘fingerprint’ patterns).
* Treatment >> Azithromycin 1gm PO single dose ,

ceftriaxone 250mg IM single dose , or

Erythromycin 500mg 4 times for 7 days (GI upset)

ciprofloxacin 500mg 1\*2 for 3 days (not safe in pregnancy)

* + 1. Granuloma inguinale
    2. Lymphogranuloma venereum :
* Caused by Chlamydia trachomatis ( L serotypes) , Painless papule, pustule or ulcer in vulva or cervix, Classical clinical sign : “groove sign” – a depression between the groups of inflamed nodes.
* Symptoms >> inguinal bubo (Inguinal and femoral buboes are localised enlargements of the lymph nodes in the groin area, which are painful and may be fluctuant not hard. They are frequently associated with lymphogranuloma venereum and chancroid), without ulcers (caused by Chlamydia).
  + 1. Tubercular ulcer

**D. Cervicitis :**

* + cervix is made up of 2 types of cells >>
    - The ectocervical epithelium (squamous) can become inflammed by the same microorganisms that are responsible for vaginitis.
    - The endocervix , lined by The glandular columnar epithelium that secrets mucus san only be infected by N.gonorrhea & C.trachomatis .
  + Diagnosis >>
    - diagnosis of cervicitis is based on the finding of a purulent endocervical discharge, generally yellow or green in color (mucopus).
    - A purulent or mucopurulent endocervical exudate visible in the endocervical canal or on an endocervical swab specimen
    - Sustained endocervical bleeding easily induced by gentle passage of a cotton swab through the cervical os. Either or both signs might be present.
    - Some patients is asymptomatic, but some women complain of an abnormal vaginal discharge and intermenstrual vaginal bleeding and postcoital bleeding.
    - 1- After removal of the ectocervical secretions by large swab, a small cotton swab is placed into the endocervical canal and the cervical mucus is extracted. The cotton swab is inspected against a white or black background to detect the green or yellow color of the mucopus.the zone of ectopy is friable or easily induced to bleed
    - 2- placement of the mucopus on a slide can be gram stained will reveal the presence of an ncreased number of neutrophils (>30 per hpf). gram neg diplococci: gonococci
    - Most common affected sites by chlamydia & gonococcal infectin are: urethra (dysuria) endocervix & bartholin gland and endometrium .
    - Chlamydia: obligate intracellular parasite (culture McCoy lines)
  + Comparison :

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|  | **Chlamydia** | **Gonorrhea** |
| **Causative organism** | C. trachomatis (atypical ) | N. gonorrhoeae (gram –ve intracellular diplococci) |
| **Symptoms** | 75% cases asymptomatic | 50% asymptomatic |
| **Clinical presentations** | abnormal vaginal discharge, burning with urination, spotting, postcoital bleeding | vaginal discharge, dysuria, abnormal uterine bleeding |
| **Diagnosis** | NAAT(nucleic acid amplification testing). | culture (Thayer Martin) & NAAT |
| **Treatment** | Azithromycin 1gm orally (single dose , safe in pregnancy) Doxycycline 100 mg orally twice daily for 7 days (can’t be used in pregnancy) | Cefixime 400mg single dose orally Ceftriaxone 250mg IM single dose |

Very important to check pictures in the slide

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