

- **Gonorrhoea**
- It can be acute, subacute or chronic inflammation in the mucosa of the genital tract. Acute and subacute stages are always easily treated with anti microbial drugs. Chronic inflammation is more difficult and more serious. The infection is usually related to genital tract but it might be demonstrated in the oral cavity or rectum of infected men or women.
- Acute stage is recognized easily in men and women. More than 50% of women who acquire gonorrhoea do not know that they acquired the infection due to the fact that it might be asymptomatic without signs and symptoms or vaginal discharge so it can be recognized during investigation or after the developing of pelvic inflammatory disease (PID) or once pregnant. Whereas in men its always associated with urethral discharge which can be so severe because during the presence of infection in the urethra there is an accumulation of large number of WBC which produce a burning sensation during urination and might be associated with high fever and abdominal pain so it's easily recognized.
- If it's not discovered in pregnant women then the baby might acquire the infection that might lead to conjunctiva and might result in the damage of cornea and cause blindness. So it's an important causative agent of ophthalmia neonatorum in certain communities where there are no pregnancy checkups or treatment.
- If the patient is not treated properly with a specific type of antimicrobial drugs, the patient whether a male or a female might enter the chronic stage which is associated with more complications. In men it's might be in the form of epididymitis which in the long run produce destruction and later result in infertility. In women it might result in vaginitis or salpingitis which is inflammation in the fallopian tubes and later associated with infertility.
- **General features of Neisseria gonorrhoea**
- It's a gram negative diplococci that resemble the kidney shape. It can be easily demonstrated by gram stain. It's highly susceptible to environmental factors. The only way of transmission is direct sexual contact, rarely acquired by other means.
- Generally the pathogenicity of N.G is related to presence oligolipopolysacharides that are smaller than the lipopolysacharides of gram negative bacteria.

- **Diagnosis and treatment**
- If there is a vaginal or urethral discharge you have to collect it and prepare a gram stain to demonstrate the presence of gram negative diplococci, however, this is not enough you have to demonstrate the presence of intracellular gram negative diplococci inside

the WBCs. Demonstration of Extracellular gram-negative diplococci is not a diagnosis for Gonorrhea.

- Culture is available using chocolate agar or using specific culture such as Thayer-Martien that has certain antibiotics to inhibit the growth of contaminants.
- In the past gonorrhea was highly susceptible to penicillin but now, more than 80% of isolates are considered resistant to penicillin, so penicillin is no longer considered as the drug of choice. Now we use 2nd and 3rd generation cephalosporins. Physicians mostly use the 2nd generation.
- Rarely, untreated gonorrhea associated with immunodeficiency can spread through the blood to the joints and might cause an inflammation of the joints (arthritis) or might cause endocarditis.
- There is no vaccine available.
- **Syphilis**
- T.pallidum, the causative agent of syphilis, is a part of the spirochete family. It is a special organism due to the fact that it cannot be cultured in vitro. We have to use a certain type of organisms and inoculate them with t.pallidum in order to culture it, we usually use rabbit testicles.
- It's considered to some extent as gram negative bacteria but it cannot be demonstrated by gram stain, it has a few amounts of lipopolysaccharides in its wall but they are not enough to demonstrate the gram negativity in the gram stain test. Its cell wall has more lipid fraction due to the peptidoglycan layer and those lipid are imp for production of side effects on CNS. It is a highly motile organism due to its long spiral shape plus it can move easily by the presence of endoflagillum which is also responsible for the attachment.
- Since we can't use the gram stain we use the dark field microscopy or silver stain to recognize it but stains are usually not so accurate in demonstrating it, we can obtain the specimen from the fluids inside the lesions on the external genitalia then we can see under the microscope that it's spiral, highly motile and exists in clumps.
- One important feature of T.pallidum is that it's highly susceptible to the environmental factors such as dryness and heat. It can't survive for more than few minutes outside the body.
- It's only related to humans, no animal source for it

- Transmission
- It's transmitted by close contact especially sexual contact in 99% of cases, also transmitted by the contact with infected body fluids from the vagina, semen or blood. Donated blood should be screened for the presence of specific antigens to make sure that the blood is not infected
- Once its passed from a fresh lesion of an infected individual to the skin or mucous membrane of other individual it will produce hyaluronidase which allows the organism to penetrate the sub mucosa and reside in the epithelial cells to produce localized infection (primary infection), this localized infection is demonstrated by the presence of lesions called chancre usually found on the external genitalia in men and inside the vagina or uterus in women, they might disappear later in the course of infection. However if these lesions didn't appear on the external genitalia of male then it would be very difficult to diagnose the first primary infection of syphilis in this male because other symptoms of syphilis such as temperature, lymphadenopathy, headache, sore throat are common in other diseases. In other words, syphilis is not easily recognized without the presence of extragenital lesions because the wide range of symptoms it has might mimic other types of infections. The primary disease is even more difficult to be recognized in women.
- Its incubation period can extend from 2 to 10 weeks. You might not recognize the developing of antibodies in this phase.
- In general the process of the disease can be divided into 3 to 4 stages:
- Primary syphilis
- This first stage is featured by the presence of small rounded ulcerous lesions called chancre on the external genitalia. They don't have large amount of pus, just few amount of WBCs. It might be just one lesion and sometimes it might be misdiagnosed with other types of mild skin infections. Lesions might appear on other parts of the body at the same time mostly on the tongue, lips and rectum then they might disappear without the recognition of any other clinical feature. Even fever might not be present. It's a very mild infection in the beginning and if not treated even after the disappearance of lesions it might develop into secondary syphilis.
- Secondary syphilis
- After few weeks to months to the primary syphilis we might recognize the secondary stage of infection which is more serious and is associated with more clinical features other than the lesions. It's more related to a generalized type of infection that is associated with skin rashes, allergic reactions and red macular lesions (**Candyloma**) on any part of the body mostly on the palms of hands and soles of the feet. It might be confused with viral infection like chicken pox.

We can find a number of active *T.pallidum* in these lesions which can be a source of infection to any susceptible person.

- During the primary phase the infectious rate is high, it is even more in the secondary stage.
- These conditions (skin rash, red spots...etc) do not necessarily indicate syphilis so the only way to make sure that this person is infected with syphilis is to know the patient history which might give an idea if he has the infection, then you have to do serological tests to look for the presence of specific anti bodies or specific antigen to confirm it.
- Pregnant woman with secondary syphilis may infect fetus vertically in utero during first trimester & at birth.. Infection may cause miscarriage, premature babies & stillbirth.
- Congenital syphilis
- If pregnant women are infected without knowing, especially during the first trimester, the organism might manage to reach the fetus leading to congenital syphilis which cannot be recognized following the birth of the newborn but develops symptoms 1 to 2 years after birth, it can lead to pain and deformities that might be severe in many parts of the body especially the face, bones and CNS. Skin rashes might appear too. Congenital syphilis does not necessarily result in death.
- Untreated babies may have facial & tooth deformities.. delays in growth or seizures along with many other problems such as rash, fever, swollen liver and spleen, jaundice, anemia, including damage to their bones, teeth, eyes, ears, brain.
- Latent syphilis
- If the primary or secondary infections are not treated with antimicrobial drugs and the body has not managed to resist the infection by the humeral antibodies and cell mediated immunity then the 3rd stage might develop. It is known as the latent stage (not associated with internal organ damage) and later might develop into the last stage . Few % infected people develop **Tertiary Syphilis**
- 4) tertiary syphilis (associated with granulomatous lesions in any part of the body)
- Latent syphilis is mostly related to developing of antibodies and hypersensitivity to *T.pallidum* antigens but they are not sufficient to stop the progress of the disease, these autoimmune conditions might lead to organ damage. At this stage the patient cannot be cured. Latent syphilis is associated with low transmission of Infection or even absent transmission. In case of no treatment, latent syphilis in a minority of people will progress to Tertiary syphilis, the most serious stage of the disease.
- Tertiary phase means the damage has been already established in internal organs. The patient is not really infectious at this stage because there is no living *T.pallidum*. So the

primary and secondary stages are infectious but the latent and tertiary are not. The damage mostly starts in the CNS, so first symptoms might be related to the mental behavior, later on it might affect the eyes, bones, jaws or any part of the body. The damage might be in the form of granulomatous lesions (gummatos syphilis) which means there is progressive destruction that might spread all over the body, it develops slowly over 5-30 years and it's not necessarily recognizable in the early years but in the end it will lead to severe damage and often the end result is the death. Tertiary syphilis is associated with high mortality. Primary and secondary are mostly not associated with any death.

- There are two important clinical complications of latent syphilis:
 - 1) neurosyphilis which is associated with degenerative CNS, brain and spinal cord damage.
 - 2) Cardiovascular syphilis which affects the heart muscle causing fatal aortic aneurysm.
- Non-sexually transmitted Treponema
- . **Pinta-Yaws**.. both are contagious, non-venereal infection caused by *T. pertenue*, *T. carateum* (according to the lipid content)
 - Human infection occurs mainly in children less than 15 years Following direct skin to skin contact with infected person.. causing depigmentation skin lesions in legs, finger, face, chest, abdomen..
- The disease occurs primarily in warm, humid, tropical subtropical areas of Africa, Asia, South America.
- **Bejel** is non-venereal syphilis-like disease.. called endemic Syphilis caused by *T. endemicum*.
- bejel infection is a non-venereal syphilis-like infection associated with CNS and internal organs complications also might result in oral and skin lesions that might spread to the nasopharynx and bones but it's a rare disease and not found in our countries. It's similar to syphilis in relation to diagnosis (serological screening methods) and treatment
- Transmission.. Direct contact.. First soft oral & skin lesion in face, later may affect Nasopharynx and bones.. Diagnosis & Treatment similar to Syphilis

- Lab diagnosis
- As we have said it's very difficult to rely only on clinical signs and symptoms to diagnose syphilis because it can be confused with other diseases. Any suspected case of syphilis should be confirmed by either of the following methods:
- If there are lesions you might obtain a fluid sample by using needle and syringe and place it on a slide in the lab and examine it using the dark field microscopy which can detect spiral shapes and motility.
- There are no culture methods to recognize the organism whether tissue or artificial mediums.
- Serology tests:
- An important non-specific test is looking for the presence for anti-lipid IgG & IgM in host Serum after 2 to 4 weeks of infection; this can be done by using serology screening tests for syphilis:
- VDRL which is easily done within few minutes, but it's not enough because it only gives positive or negative result. (presence of the Ag)
- RPR is replacing the VDRL because it is more accurate and more specific.

- Even if there are clinical features present & positive screening test you have to confirm this by another tests, the specific confirmatory tests:
- fluorescent Treponemal antibody absorption test (FTA) is an excellent test and it often gives positive result if the infected patient is in the primary or secondary stage and might give positive in the tertiary stage but it is often used to confirm the primary and secondary stages. It might give negative result in an infected patient if the patient is treated with antimicrobial drugs.
- T.pallidum microhemagglutination assay, this test is excellent too but easier to be done because in the FTA test we have to use immunofluorescence microscopy, this test is a serological test that requires special slides and usually it often gives positive in all the syphilis stages, the primary, secondary and tertiary.
- All (serological and confirmatory) tests can't distinguish Syphilis from other non-sexually transmitted Treponema infections such as Pinta-Yaws, Bejel, They are skin infections not true Syphilis. They produce similar immunological reactions and might result in developing of granulomatous lesions on the skin
- Treatment
- Syphilis is a very dangerous disease but it is very easy to be cured in its early stages. Primary syphilis is easily cured with one injection of penicillin. If the patient is hypersensitive to penicillin we can use doxycycline for 3 to 5 days. You need to treat




both partners in order to prevent later transmission. The cure is 100% in the first stage. In the secondary stage it might reach 95 to 99 % but in tertiary it's not curable because autoimmune reactions already have developed.

- There is no available vaccine.

- **Chlamydia trachoma.**
- **C. trachoma is one of the most widespread bacterial of STDs .. About 50 Million of cases each year worldwide..Human natural host, Genital serotypes.. Intracellular Growth, Inclusion Bodies.. Elementary bodies..infectious stage, Reticulate bodies replicate in infected mucosal tissue (inclusion bodies).**

- **Chlamydial infection followed vaginal/anal sexual contact with an infected partner.. Sexual Infection is more asymptomatic in women than men.**
- It's proved to be one of the most common associated with cases of STD infection. About 50 Million of cases each year worldwide mostly in western countries in addition to our country (according to study performed in JUH & many clinics it is found that this organism in specimen from infertile & fertile males which means that these are important causative agent for STDs .
- Chlamydia trachomatis resembles Gram –ve bacilli but it can't be demonstrated using gram stain and it can't be cultured by artificial medium, we have to use special culture medium like . McCoy cell tissue culture due to the fact this organism is INTRACELLULAR organism that means it can't replicate outside in the artificial medium as the other types of bacteria.
- in addition it has a special replication cycle composed of two stages : one is the infectious particles known as elementary bodies that is seen in inclusion bodies within the infected tissue once released from the infected tissue it will infect others and resulted later in the development of 2nd stage of growth which is known as elementary bodies in turn infect the mucosa of genitalia as example it will produce inclusion bodies- the replication of infectious part- and often this will cause rupture of the cells and release of elementary bodies which later produce the cycle of infection and so on , SO in short the replication is similar to that of viruses Concerning its replication in the nucleus or cytoplasm of a cell
- ,so again *Chlamydia is a special organism* despite the fact its presence can be without symptoms within the genital tract OR it might be associated with certain symptoms
- that is mild in the beginning especially in females more than in
- males so you might not be able to recognize the presence of the infection
- But in long run the consequencing of the infection can be recognized.

- **Chlamydia symptoms usually appear within 1 to 3 weeks.. In men, most early symptoms are mild, Few pus cells- dysuria, nonspecific urethritis.. Non-treated infection may progress slowly over years to Epididymitis, Prostatitis & Infertility.**

-  In males the presence of this organism might associated with mild dysuria(burning during urination) & it might be also associated with discharge of few fluids which known as non gonococcal urethritis or recently they use the term non specific urethritis which means there is discharge & irritation of urethra & pain etc BUT not similar to what you recognize in relation to gonococcal infection where the discharge usually can be easily recognized and often it includes large numbers of WBCs & associated with fever and abdominal pain. However in both of  & 

- Its presence might resulted in what so called consequencing --> obstruction in one or other part of genital tract, this is an example indicates that Chlamydia trachomatis causes Variety of genital tract infection BUT it might reach respiratory tract especially in case of asymptotically infected mother contaminate the newborn with the organism which might reside in the conjunctiva and later can be associated with conjunctivitis if not treated it damages the cornea ending with blindness.

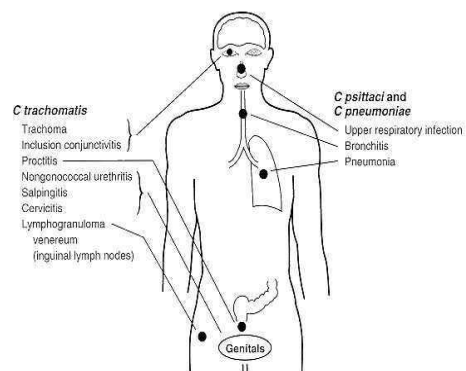
- Chlamydia trachomatis is an important causative agent of blindness in infants

- Another route for acquiring this infection in infants : the oral cavity contaminated with amniotic fluid contains the chly.tra reaching after that to the lung ending with chlamydia trachomatis pneumonia this is rare and more common with other organisms>

- Generally the infection often can't be recognized without investigation
- Rarely & might be recognized if some complications related to vaginal discharge
- Usually very mild and it might be confused with candidacies or other organism
- So we need a lot of investigation to prove that this infection is caused by this organism

- **In women infection causes cervicitis, urethritis,**
- **Proctitis, endometritis, salpingitis..** together can be recognized in form of
- **Pelvic inflammatory disease (PID).. Pelvic adhesion & Infertility.**

- PID is a very serious condition might be associated with
- Obstruction of fallopian tube ending with infertility



- as you see it not necessarily to recognize these features at the beginning may be the infection progress slowly and later after few years can be recognized the same also in relation to men generally they have a mild infection & if present usually with non specific symptoms related only to dysuria & pain sensation during urination
- **Newborn baby who is exposed to *C. trachomatis* during delivery may develop an eye infection, inclusion conjunctivitis.. Ophthalmia neonatorum.. Complication.. Trachoma.. Blindness.. Rarely cause Neonatal atypical pneumonia.**
- **Symptoms of conjunctivitis, which include discharge and swollen eyelids, usually develop within the first 10 days of life.** the damage of the eye → cornea is slowly progress so it's recognized maybe after 2,4,6 weeks after delivery not necessarily at the beginning
- **Adult infection.. Develop inclusion conjunctivitis.. spread from genitalia to eye.**
- If accidentally the organism reach the eye of adult it might result in conjunctivitis a very painful infection & require treatment otherwise complications will develop.
- Diagnosis:
- **Detection Chlamydia Plasmid/DNA in urine/cervical swabs/ urethral swabs by PCR test**
- In the past the only way was to culture the specimens on special medium as Macoy cell culture and this require at least 1 week in order to say whether it's +ve or -ve and not always easy to diagnose the Chlamydia by the presence of inclusion bodies using a silver stain. Later they develop the serological test which detects the specific antibodies following the infection & this is prove NOT to be accurate, unfortunately serological test was considered as evidence of infection despite the fact that it isn't the specific, vaginal infection or urethral not necessarily to be associated with the development of specific humoral Abs, it might occur but rarely & not that much important
- **Elementary bodies of Chlamydia can be identified by direct smear prepared from discharge.. stain with monoclonal antibodies, detected by florescence microscopy by Direct immunofluorescent test**
- Later they develop direct immunofluorescent test where they collect the specimens as urethral swab or cervical swab then stain with special immunofluorescence dye using florescence microscopy in order to recognize the presence of the antigen of Chlamydia,, NOW in last 10 years a new test has been relied on detection of specific plasmin within the cytoplasm of the chlamydia ,this plasmin only found in Chlamydia so they prepare primers to detect this

plasmin and this plasmin is detected as DNA by using PCR this test is proved to be very accurate ,very specific and now the most common test used to detect Chlamydia infection.

- In the past the specimens for this test were urethral swab or cervical swab in relation to genital & may use conjunctival swab BUT they have discovered that during the infection with Chlamydia or the presence of Chlamydia during the infection of UGT there will be excretion of the antigen , there will be presence of dead bodies of Chlamydia and this allow to use urine for detection of Chlamydia plasmin DNA because it is more stable in the urine & urine easily to be collected as first portion specimen of urine in early morning to recognize the presence of this organism , this means less invasive method because of urethral or cervical swabs require visits to clinics .
- **Serological test not significant for detection genital infection.**
- Shouldn't be considered because it doesn't distinguish between acute & chronic infections & not necessarily to be associated with the presence of the organism.
- **Chlamydia is easily confused with gonorrhea because the symptoms of both diseases are similar and both diseases may occur together**
- However based on clinical manifestations there is a difficulty to distinguish between Chlamydia & other STD infections particularly gonorrhea mainly among females , in males as mentioned it is more easily to recognize the presence of gonococcal infection while it is more difficult & require culture in ♀
- In addition among chlamydia there is several serotypes based on the difference in the cell membrane & cell wall in the organism ACCORDYING to serotype there is 2 serotypes known as L1& L3 , these serotypes are associated with more complicated form of Chlamydia infection known as **Lymphogranuloma venerum disease..** there is lymphadenopathy in addition to vaginal discharge resulted in more complication in renal system particularly the kidneys & may also form infection in a form of inflammation in GIT ,
- **C. trachomatis.. serotypes L1-L3.. Common in tropical countries rarely in ours ..Infection starts as genital ulcer with Lymphadenopathy.. spread to genito-urinary and gastrointestinal tract.. causing inflammation & strictures in genital tract**
- **Treatment: Doxycycline.. Erythromycin**
- **Non vaccine is available**

- the drug of choice is erythromycin or any type of macrolides BUT doxycyclin is excellent and can be used for a short period to cure the patient from the infection but re infection is VERY common especially if one of the partner not treated therefore for all STDs you have to STRESS to treat both partner to prevent the cycle of infection .
- 80-85% of STD are caused by Chlamydia

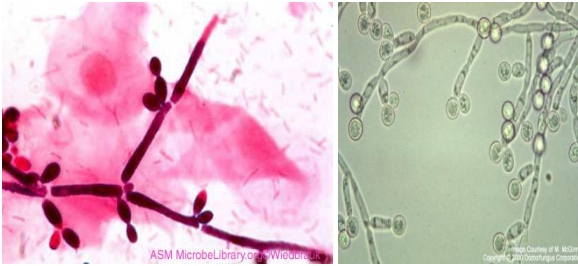
- NOW other 3 types of organisms which might associated with ST infections despite the fact these organisms might be part of UGT flora ,it might be preset without signs & SYMPTOMS & Only under certain condition- still some of these conditions unknown – it might develop genital tract infection often in association with non specific urethritis ,nearly these ***Mycoplasma genitalium/ M. hominis, Ureaplasma urealyticum*** all of these 3 types may cause the same specific symptoms or 2 ,3 together contribute on the same symptoms ,infection by 2 out of these organism would be more extensive than the infection by 1 .Generally up to 20% of males & females of population might be infected with 1,2or 3 organisms again without any clinical symptoms ONLY LATERE the symptoms will be recognized especially in females once they develop a form of cervicitis , endometritis ,salpingitis or in short pelvic inflammatory reaction here the physician began to think of these organisms and try to diagnose then treat the patient but sometimes it would be to late because the presence of these organisms might be associated with discharge , preterm labor and so on ,, in relation to female complications following the infection is considered to be important .
- ***Mycoplasma genitalium/ M. hominis, Ureaplasma urealyticum***: These can be present without any symptoms in about 20% genital tract males/females.. Single or more organisms may cause up to 25% of cases of non-specific urethritis ..mostly *M. genitalium* in men.. Mild discharge, Burning and pain during urinating. In women 10% cases of mucopurulent cervicitis & PID.. *M. hominis/ M. genitalium*
- **The** term vaginitis is a very common , it's a feature associated with married women and is enhanced by sexual contact ,often is been as inflammation of vaginal mucosa and this can be due to one or other types of bacteria or Candida it depends on the features of infection . Bacterial vaginosis usually means there is a mixture of bacteria aerobic and anaerobic mycoplasma etc and together these might give the impression of this infection and easily recognized due to fishy odor, mild discharge, pain during sexual contact and it might be associated with abortions or preterm labor.
- The danger of this infection if it progress without treatment will be infertility. So it's important concerning females to check if the infection is present to treat because the infertility increases by continuous presence of these organisms

- **Vaginitis is an inflammation of the vagina.. Vaginal discharge.. It often is caused by bacterial or Candida infections.**
- **Bacterial vaginosis (BV).. Mixed bacteria is the most common cause of vaginitis..**
- **Once the normal balance of vaginal bacteria is disrupted .. absence of lactobacilli. It is accompanied by symptoms: discharge, odor, pain, itching, burning. women of childbearing age may be associated with preterm labor, abortion, PID, infertility**
- Concerning the lab diagnosis now it can be done by collection of urine & detection of all these organisms by using PCR . **Lab Detection: Urine / cervical swabs..PCR.**
- **Treatment: Doxycycline.. Erythromycin**
- We have an organism called ***Gardnerella*** vaginalis which is part of vaginal flora in addition to lactobacilli, again this organism under certain condition especially following administration of antibiotics or steroids drugs and others, the flora might within the vagina changes due to changes in the PH and might increases in numbers especially Gardenella increases with alkaline medium than neutral or acidic medium. Bacterial vaginosis associated with the infection and gives the impression of the patient is infected with STD but it's in fact due to activation of endoflora of vagina and often it can be treated with drugs that used to treat anaerobic infection like metronedazole or chlindamycin. So it not recognized as STDs but it gives the impression of that.
- ***Gardnerella vaginalis*: Part of vaginal flora.. may cause in association with anaerobic or other bacteria vaginitis..**
- **Diagnosis: Direct Gram-stain..Presence of numerous "clue cells" (cells from the vaginal lining.. coated with numerous gram-variable bacteria & fishy odor**
- **Treatment: metronidazole or clindamycin .**

- **Yeast infections.**

- Within the genital tract in males& females always few numbers of yeast cells which is of 2 types one has no significance known as budding yeast, in fact rarely associated with irritation or infection , the 2nd type which known as Candida –within it we have many species as albicans, tropicalis, glabrata, krusi etc ,we have 5 very common Candida species all can be involved in features of vulvovaginal candidiasis .
- vulvovaginal candidiasis means the followings: there is irritation, pain during sexual contact ,pain during urination & associated with vaginal discharge but this discharge is more thick and associated with epithelial cells which is can be easily recognized by using wet preparation to demonstrate the presence of yeast cells :elongated yeast cells or pseudohyphae which is associated with the infection

- **Candida albicans Pseudohyphae**



- **Vaginal yeast infection, or vulvovaginal candidiasis, is a common cause of vaginal irritation..discharge**
- **This common fungal infection occurs when there is an increase in presence of one or more *Candida albicans* or others *C. glabrata*, *C. tropicalis*, *C. krusei***
- **Although this infection is not considered an STI, 10 to 15 percent of men/women develop symptoms after sexual contact with an infected partner.**
- **The presence of vaginal candidiasis is not a difficult task to be recognized in wet preparation or Gram stain, the importance is to treat the patient & to prevent the occurrence of vaginal discharge with candidiasis . Candidiasis is not easily to be eradicated despite the use of antifungal drugs whether topical or 25:55 is often can reoccur due to change in vaginal flora in particular. In males candidiasis is very rare and if it presents this means there is obstruction in the genital tract & maybe in immunocompromised patient but in females is very common it can be occur each month, 2-3 months .**
- **The only way to prevent the devolvement of vaginal candidiasis is to restore the vaginal flora by less use of wide spectrum antimicrobial drugs & other drugs which might enhance the growth of Candida.**
- **Rarely for Candida or other STD's causative agent except for Chlamydia to reach blood stream unless there is obstructions also rarely to reach the upper urinary tract, kidneys producing complications.**
- ***Candida spp.* are always present in the vagina in small numbers.. Several factors are associated with increased yeast infection in women, including Candidiasis often is recognized in following conditions :**
- **Pregnancy, Using oral contraceptives, steroid drugs and use of antibiotics, Having uncontrolled diabetes mellitus. Wearing tight, poorly ventilated clothing and synthetic underwear may contribute to vaginitis.**

- Candidiasis often is recognized following these conditions 1st pregnancy because it's associated with changes in vaginal pH, Using oral contraceptives steroid drugs and use of antibiotics especially wide spectrum antibiotic, presence of underlying diseases as DM & others, wearing tight clothes might enhance the infection with Candida especially wearing synthetic underwear might worsen the area & support the growth of Candida and it's moisture because it prefers to replicate in moist. These all should be considered to prevent the reoccurrence of candidiasis.
- **The most frequent symptoms of yeast infection in women are itching, burning, and irritation of the vagina. Painful urination are common.**
- **Vaginal discharge is not always present and may be a small amount. The thick, whitish-gray discharge is typically described as cottage-cheese-like, although it can vary from watery to thick discharge**
- **Microscopic examination of discharge/urine**
- **Presence of numerous yeast cells.. Pseudohyphae.**
- **Culture on Sabouraud Dextrose Agar, ChromCandida Agar, Serum Germ Tube test**
- Lab diagnosis for yeast it is Not so difficult it can be direct detected using wet preparations from
- vaginal swab usually elongated cells detected in clinic if they have microscopes or to be sent to the lab for culture with 24 hours the recognition of candidia type is performed.

- **Various antifungal vaginal drugs are available to treat yeast infections.**
- **Antifungal creams can be applied directly to the area.. oral or suppositories of fluconazole, miconazole, clotrimazole, and tioconazole.**

- In fact in the last few years we have notice that more &more candidia krusi & glabrata become associated with vaginal candidiasis this means these 2 species other than albicans which is common associated with 70%-80% of vaginal candidiasis, krusi & glabrata are more resistant to fluconazole which is widely used in treatment of vaginal candidiasis unfortunately there is miss use for this drug with krusi & glabrata so you have to use other drugs because of resistance development , this is costly & needs more visits to clinics .
- This is important in getting no response after using antifungal drugs whether fluconazole ,or miconazole or, clotrimazole, or tioconazole then you have to culture to specify the type of candidia in order to select the proper antifungal drug .