

Normal Microflora of the Urogenital System

* Defence Mechanism

in urinary tract

- All parts of urinary system except the portion of the urethra closest to the urethral opening are sterile.
- Escherichia coli & Lactobacillus are the most common m.o colonizing the outer portion of the urethra
- Acid pH and high salt and urea concentrations retard the growth of bacteria in urine.
- In males, other than the last third of the urethra, the genital tract does not have a normal microflora and is sterile

↳ have long urethra that make urinary infections low in males

* ~~genital tract~~ in male doesn't have any Normal Microflora except last part in urethra

Subject _____ Day _____ Date _____

* PH in Vagina = 3.8 - 4.4 in aged women *
elderly & young & neutral &
Women girl

Gardnerella & anaerobic interaction
Vaginalis bacteria
Bacterial interaction
Vaginitis

Vaginal discharge
Rich in M.O.B. & G. vaginalis
Smell

Urinary tract infections

Name urinary infections depend on site of infection

- Urinary tract infections are a group of common diseases that occur predominantly by ascension of normal enteric flora through the urethra into the bladder.
- UTI causes urethritis (inflammation of urethra) & cystitis (inflammation of bladder)
- Infection spreads from urethra (in female 4cm, males 20cm) to bladder causing urethrocystitis, women affected ~50X more than men.
- Sometimes infection ascends to reach kidneys & cause pyelonephritis.

Less often, infections begin in the kidneys and descend to the urethra.

* infection occurs due to ascending of M.O from urethra to bladder $\uparrow \rightarrow$ kidney

* M.O can transfer from blood to kidney or other part of urinary tract and cause infections as

Urinary tract infections desending M.O

- In males the prostate gland is closely associated with the urethra and bladder, so **prostatitis, or inflammation of the prostate gland**, often accompanies UTIs.
- *Escherichia coli* is the causative agent in 80% of UTIs, but other enteric bacteria from feces such as *Proteus mirabilis* and *Klebsiella pneumoniae* can also cause such infections.

A Typical Bae

- When *Chlamydia* or *Ureaplasma* are responsible for infection, they usually are sexually transmitted.

* عادة سبب حدوث urinary infections و incomplete urination وبالتالي
 N.O back urine U
 الى bladder

* in Pregnant women or People have Prostate enlargement state *
 that will interfere with urin flow and will cause Retention of
 the urin and will cause urinary infections.

bladder 31

* in Pregnant women or People have Prostate enlargement State *
that will interfere with Urin flow and will cause Retention of
the urin and will Cause urinary infections.

Urinary tract infections

→ by Signe and Symptoms, urine culture

- Diagnosis is made by identifying related clinical symptoms(**dysuria** or pain and burning on urination) in combination with an abnormal urinalysis and growth on urine culture.
- UTIs are treated with antibiotics, such as amoxicillin, trimethoprim, and quinolones, or with sulfonamides according to susceptibilities of their causative agents.
- Prompt treatment helps prevent the spread of infection. UTIs can be prevented by good personal hygiene and frequent, complete emptying of the bladder.

urine dip stick
لٹاچ دیپ سٹک

DIAGNOSTIC TESTING FOR URINARY TRACT INFECTIONS

- For non-catheterised patients, a well taken midstream specimen of urine (MSSU) should be collected, avoiding perineal contamination, into a sterile universal container.
- Ideally samples should be processed as soon after collection as possible, to prevent bacterial overgrowth. If a delay in processing is unavoidable, samples should be refrigerated at 4C.
- **Urine microscopy is the use of a microscope to look at urine.**
- **Urine dipsticks use different chemicals reagents on a strip that is dipped in urine to diagnose urinary tract diseases.**
- **Urine culture allows identification of the organism causing infection.**

Inflammation of bladder ← CYSTITIS

- Cystitis is an infection of the bladder.
- The clinical features of lower UTI commonly include dysuria (pain on passing urine), urinary frequency, urgency and fever.
- ***Escherichia coli* is by far the most common cause of urinary tract infections, especially cystitis.** Other enteric gram-negative rods such as *Klebsiella* species and *Proteus* species are regular culprits. *Pseudomonas aeruginosa* can cause urinary tract infection.
- ***Candida* species can cause infection in patients who have extensive to antibiotic use.** Rarely, viruses such as adenovirus and cytomegalovirus can cause a hemorrhagic cystitis. These viruses almost exclusively cause cystitis in immuno-compromised hosts.

infection in bladder ← معقن نقل
Cystitis ← معقن الكثر كروت
الفيرس والفطريات.

PYELONEPHRITIS

- Is an infection of the kidney(s).
- may occur either by ascension of bacteria from the urethra to the bladder and then to the kidney(s) or, less commonly, through hematogenous spread from other sites of infection.
- *Escherichia coli* is the most common pathogen causing pyelonephritis. Other enteric gram-negative rods such as *Klebsiella* and *Proteus* species are also involved. *Pseudomonas aeruginosa* can cause pyelonephritis.

immuno ComPromise في ~~مصابة~~ Candida ممكن يحدث بسبب
host

علاجها أمoxicillin أو cephalexin
antibiotics و hospitalized ←

most common sign
urination at night ←

PYELONEPHRITIS

- Patients with pyelonephritis typically present with fever, flank pain, nausea, and vomiting. They may or may not have signs and symptoms of lower tract infection (dysuria, frequency, hematuria, suprapubic tenderness).
- Treatment: Antibiotics that are able to obtain high concentrations in the renal parenchyma and have activity against common pathogens are required to treat pyelonephritis.
- Empiric regimens for community-onset infection include a fluoroquinolones (ciprofloxacin or levofloxacin) or a third generation cephalosporin such as ceftriaxone.

Genital infections

- **Vaginitis:** The term applies to inflammation of vaginal mucosa that may extend to the vulva and is commonly associated with a white or yellow discharge.

أسباب ممكنة تسبب Vaginitis

- Predisposing conditions: pregnancy, diabetes, oral contraceptives, menopause, conditions that result in estrogen & progesterone imbalance will result in pH & sugar change.
- Causative agent of Vaginitis: Gardnerella vaginalis in combination with anaerobic bacteria, Candida albicans (yeast), the protozoan Trichomonas vaginalis (sexually transmitted).

ممكن يكون السبب بكتريا، فطريات، فيروس

- **Bacterial Vaginitis** is usually caused by opportunistic organisms from disturbance of normal flora by antibiotics or other factors.

نقل البكتريا التهاب في Vagina

← يحدث ← disturbance Normal Flora ← ونقل عن حدوث التهاب

← ممكن بسبب امتداد ←
menopause أو extended antibiotics
age

Genital infections

menopause age ← يمكن بسبب استخدام extended antibiotics

Genital infections

- **Bacterial Vaginitis** → most common an aerobic مع
- Gardnerella vaginalis : G-ve bacillus or coccobacilli → bacteria مؤولين عن
- Symptoms: frothy, fishy-smelling vaginal discharge, even discharge is small but contains millions of m.o. Bacterial Vaginitis
- Treatment: (anti Protozoa and antibacterial) Metronidazole (to kill the anaerobic bacteria needed for the association to produce disease), Ampicillin & tetracyclines may be used
 → لا يحتاجون مترابطة anaerobic bacteria لدم أقتل
 Gardnerella vaginalis مع ومواجهة

*

male

or

female

يمكن يحدث في

Genital infections

- **Trichomoniasis (Trichomonas vaginitis)** - Caused by flagellated protozoan *Trichomonas vaginalis* (TV) → Protozoa

- Primarily is STD, → Sexual Transmitted disease
- Most women with TV are believed to be asymptomatic. However, abnormal vaginal discharge (white discharge (egg white consistency)) vulval and peri-anal itching are the most common symptoms.
- During pregnancy, TV can cause pre-term delivery and low birth weight
إذا أصيبت فيها الحامل يمكن تسبب ولادة مبكرة
- Treatment and prevention in adults مولادة أطفال بوزن قليل

Multiple or single dose of oral metronidazole; and restoration of normal vaginal pH in women → more acidic حتى تصبح

Sexual partners of women with TV need to be treated as well.

→ هي Protozoa غشائي Flagella وهادبا عنها *

attachment على
on Vagina

→ * Flagella Protozoa attach on Vagina

→ it is not STD

Genital infections

infection by fungi

opportunistic infections
وبعدا بغير جهاز المناعة المنخفضة

Vulvo-vaginal candidiasis (VC); ('Thrush') is caused by Candida albicans in the majority of cases.

- Immunosuppression (secondary to HIV, or immunosuppressive agents), diabetes mellitus, pregnancy, use of broad spectrum antibiotics can each predispose women to VC.

- Clinical features: Itching and irritation, vaginal discharge, dysuria are the most common complaints.

thick بيوت

- Treatment: Topical azole antifungal agents (as pessary or creams) can be used; clotrimazole, miconazole; A single oral dose of fluconazole is an alternative

تأجيل

SEXUALLY TRANSMITTED DISEASES

- **Non-gonococcal urethritis and cervicitis is caused by Chlamydia trachomatis.** → Female و male ممكن يصيب
- The majority of infected (70% of female and 50% of male) patients are asymptomatic.
هناك في Female تؤدي الى حدوث وممكن مع الوقت يعمل عقم (infertility)
- Untreated chlamydial infection can cause pelvic inflammatory disease (PID) in 10-40% of women that may result to infertility. عقم
- Treatment: tetracyclines & sulfa drugs. Chlamydia not susceptible to penicillins
ما ينجح Chlamydia
A Typical Bacteria ← هي عن

SEXUALLY TRANSMITTED DISEASES

→ it is STD

- **Gonorrhea** is caused by *Neisseria gonorrhea* urinary tract and Vagina
- Has Attachment pili (fimbriae) enable gonococci to attach to epithelial cells that line the urinary tract so that they are not swept out with the passage of urine.
 ← وبالتالي يمنع البكتريا ان تجرد لها Release في urine
- Gonococci produce an endotoxin that damages the mucosa in fallopian tubes and releases enzymes such as proteases and phospholipases that may be important in pathogenesis.
 ← البكتريا تفرز endotoxin وتقلل damage في Female genital tract (Fallopian tubes)
- It is killed by phagocytes but some bacteria can survive inside the leukocytes

← ويمكن نقل عقم عن النساء

يحدث لها ~~Phagocytosis~~ Phagocytosis عن طريق

Phagocyte cells ex: WBC, Leukocyte

لكن ممكن تقاومها وتبقى داخلها وبالتالي يصعب علاجها

SEXUALLY TRANSMITTED DISEASES

Female ^{ممكن نقل (PID) ونقل عقم في}

- The urethra is the most common site of gonorrhea infections in males.
- The most common site of infection in females is the cervix. As many as half of infected females develop pelvic inflammatory disease (PID).
- Disseminated infections, which occur in 1 to 3% of cases, produce bacteremia, fever, joint pain, endocarditis.

ممكن ينتقل الى الدم
ويوصل التهاب في القلب

- Treatment: Most frequently used is Cephalosporin e.g Ceftriaxone plus Azithromycin. The reason of dual treatment is that people with N. gonorrhea are most of the time co-infected with Chlamydia trachomatis & azithromycin is effective against it. If allergic to cephalosporins use spectinomycin

→ active against A Typical Bacteria ex Chlamydia

لا
عنه حساسية
Penicillin
سيفترول
Cephalosporin

coinfected ^{عامة يصرفه} with Chlamydia Bacteria
Nessieria gonorrhea

Spectinomycines

Viral Sexually Transmitted Diseases

- **Herpes simplex virus (HSV) infection.**
- Two closely related viruses: HSV-1 (typically causes cold sores) & HSV-2 (typically causes genital herpes) cause same kind of lesions on mucous membrane of mouth & genitals.
- HSV results in a chronic infection that may cause recurrent episodes.
- Initial HSV-1 or HSV-2 infection can be asymptomatic, Most adults have antibodies to herpesviruses, but only 10 to 15% have experienced symptoms. *مع بعض الأشخاص أو شخص لها*
- In both HSV-1 and HSV-2 infections, vesicles form under keratinized cells and fill with fluid from virus-damaged cells, particles of cell debris, and inflammatory cells. Vesicles are painful, but they heal completely in 2 to 3 weeks without scarring *مورصلات فيها Virus*



يصاب الشخص وينتقل له بقايج الكائنات الفيروسية
ممكن يصير في نفس المكان او مكان آخر.

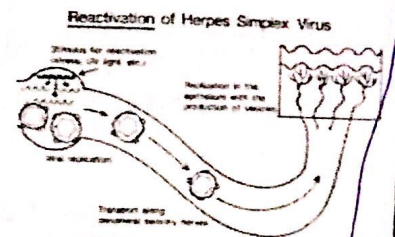
لانه الفيروس من النوع الذي يعيش في حالة *Latent* او *dormant* *Virus*
خلال اسبوعين يتجه في *Reactivation* او *Reinfected* اذا تعرض الشخص لحرارة او *Stress*
او *hormone* *Imbalance* *لل* *Virus*

Viral Sexually Transmitted Diseases

لأنه الفيروس من النوع الذي يعيش في حالة *dormant* أو *latent* *Virus*
 خلال أسبوعين يتخفى في *neuron* إذا تعرض الشخص لحرارة أو *Stress*
 أو *hormone* *Reactivation* *Reinfected* *Viruse* *Imbalance*

Viral Sexually Transmitted Diseases

- Herpes virus is a latent virus, within 2 wks of active infection, viruses travel via sensory neuron to ganglia where they replicate slowly or not at all.
- They can reactivate spontaneously or be activated by fever, stress, hormone imbalance, menstrual bleeding, a change in the immune system, or trauma.
- Recurrences can be limited to one or two episodes or can appear periodically for the life of the patient
- Once the virus reaches target epithelial cells and starts to replicate, antibodies can neutralize the viruses, and T cells can eliminate virus-infected cells.



* ممكن يرجع مرة أو مرتين خلال السنة ويمكن أكثر

+ عادة يحدث في نفس المكان ويمكن بمكان آخر
 يكون علاجية أصعب وأبطأ

ممكن يروح الى *epithelial cell* وإذا كان في البداية يكون متواجدا

antibodies that acts neutralize For viruses and activate T-cells that can help to eliminate virus

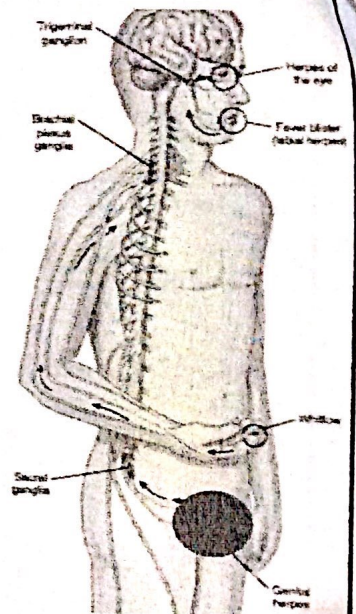
Viral Sexually Transmitted Diseases

• After an occurrence of a lesion, they migrate to ganglia, from which they travel back to the site of the original lesion at the time of the next outbreak.

• An exception to this pattern sometimes occurs at the trigeminal ganglion, at which three branches of the trigeminal (fifth cranial) nerve join. Virus from a lesion on the lower lip could migrate out along the ophthalmic branch on a subsequent episode, causing the eye to become affected, or even migrate backward into the brain, causing meningitis and brain damage.

إذا نجح الفيروس في Trigeminal ganglion إلى تنقيبات
ويرجع إلى Lower Lip ويصل infection و infect in eye

والخطير يعود إلى brain ويصل
encephalitis و meningitis
و brain damages



Viral Sexually Transmitted Diseases

- Genital herpes: causes vesicles in genitals of both males & females which are severely painful & itchy. Lesions shed viruses which are very contagious.
- Women infected with genital herpes may be subject to three other serious problems : *اذاصاب Women حيث Complications*
 - 1- the incidence of miscarriages is higher among women with genital herpes , *اجهاض*
 - 2- the infant of infected pregnant woman must be delivered by Caesarean section. *تضطر الى ولادة قيصرية بدل الطبيعية*
 - 3- Finally, infected women have an increased risk of becoming infected with the AIDS virus. *تصبح عرضة اكثر للإصابة باليدز*

• Treatment

Virus

فمن

antiherbs

Vir

رهابها

- HSV-DNA polymerase inhibitors (aciclovir, valaciclovir, famciclovir) used systemically are highly effective in controlling HSV episodes. These agents do not eradicate infection.
- Aciclovir is used for recurrent episodes.
- For patients with frequent HSV recurrence episodes (more than 5 episodes a year), suppressive therapy can be initiated. This includes acyclovir or valaciclovir once a day. The duration of suppressive therapy is 12 months.