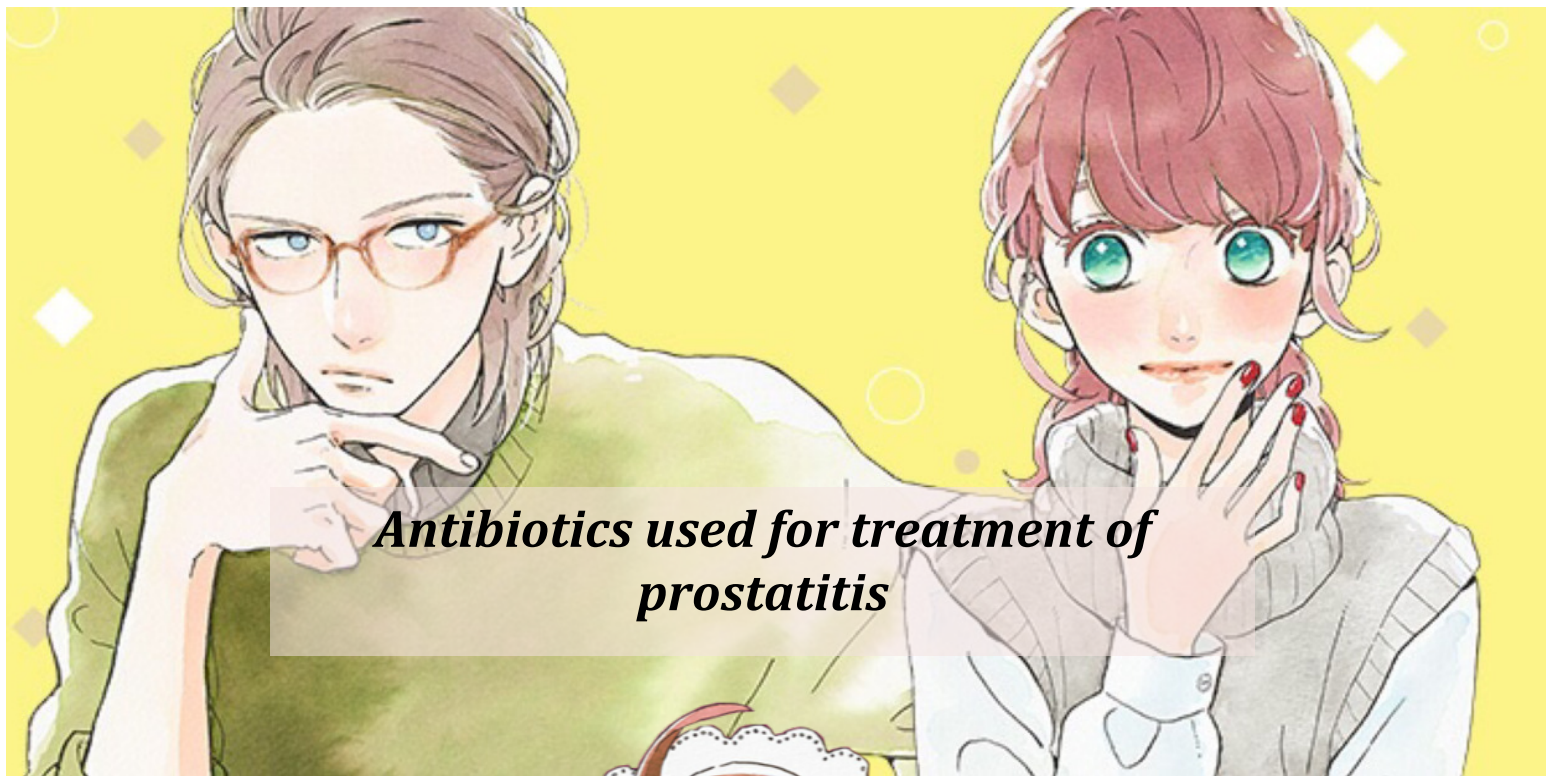


TREATMENT OF URINARY TRACT INFECTIONS

OBJECTIVE 1

Recognize different groups of antibiotics used in urinary tract.



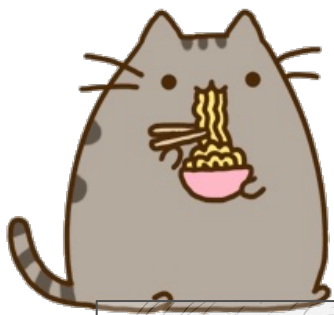
TMP/SMX

3rd Generation cephalosporin
Ceftriaxone

Quinolones: Ciprofloxacin
, levofloxacin

Tetracycline's
Doxycycline





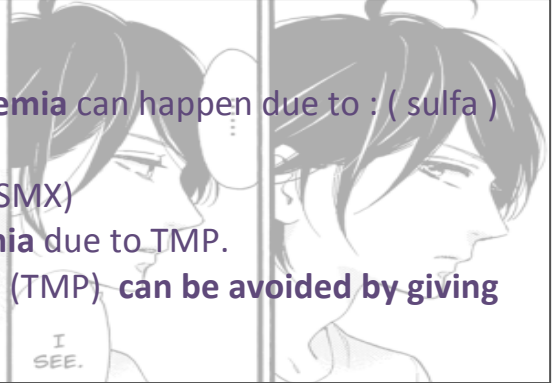
ADRS

GIT



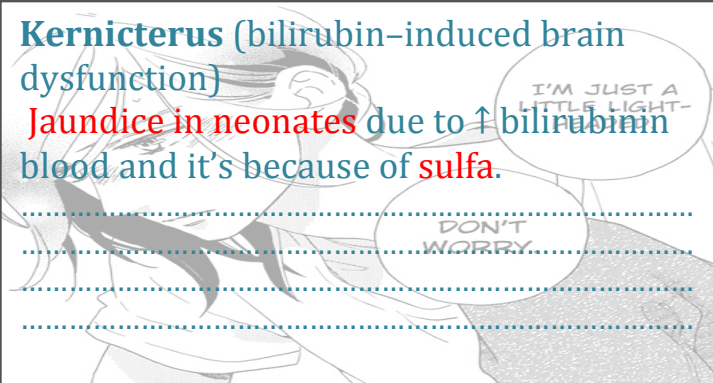
Hematologic:

1. Acute **hemolytic anemia** can happen due to : (sulfa)
 - a) hypersensitivity
 - b) G-6-PD deficiency (SMX)
2. **Megaloblastic anemia** due to TMP. (folic acid deficiency) (TMP) **can be avoided by giving folic acid**



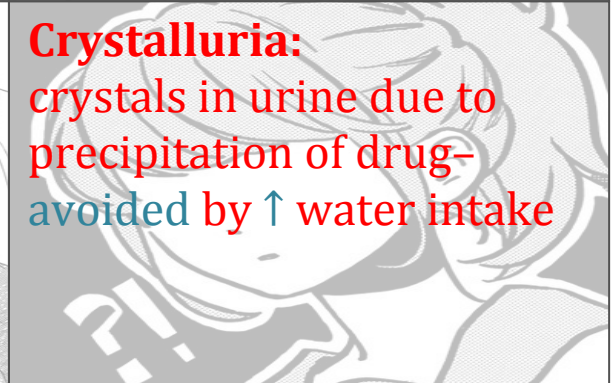
Kernicterus (bilirubin-induced brain dysfunction)

Jaundice in neonates due to ↑ bilirubin in blood and it's because of sulfa.



Crystalluria:

crystals in urine due to precipitation of drug-avoided by ↑ water intake



Hypersensitivity reactions >> urticarial or fever



CONTRAINDICATED

- Pregnancy (cross placenta)
 - Nursing mother (secreted in milk)
 - Newborn Infants (encephalopathy)
- Jaundice that might cause abnormalities in brain.
- Renal or hepatic failure (caused by metabolism & secretion).
 - Blood disorders (give supplements).

Drug : Nitrofurantoin

Organisms :

Effective on E-coli

Susceptible: Gram +ve

Not effective: P-aeruginosa

MECHANISM OF ACTION

Changed by bacteria to an active agent that inhibits various enzymes and damages bacterial DNA

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Pharmacokinetics

- **orally** → Absorbed rapidly and completely from GIT (Because of that it causes gastric irritations , so it should be given with food).
 - Well concentrated in the urine.
 - Rapidly metabolized by the liver.
 - 40 % is excreted unchanged into the urine → Turns urine to a **dark orange - brown**.
 - Given with food.
 - higher activity in acidic urine.
-
-

SPECTRUM : Bactericidal

Clinical uses

- urinary antiseptics .
 - Prophylaxis: for recurrent UTI
 - Not effective in systemic UTI as **pyelonephritis**
 - Dose: 50-100 mg (orally four times daily) for 7 days
-
-

ADRs

- GIT
 - Headache and nystagmus.
 - Hemolytic anemia (G-6-PD deficiency) **EHH?!**
 - Pulmonary fibrosis (on chronic use) **HUH?!**
-
-

Contra- indications

- Patients with G-6PD deficiency
 - Neonates (babies up the age of one month) **HAIR.**
 - ↓ renal function
 - Pregnant women (after 38 weeks of pregnancy) **OH...**
[even at late pregnancy] **IS IT FROM THE MORNING?**
-
-

Drug : Tetracycline (Doxycycline - Minocycline)

This substance likes to combine with milk products (Ca), so it can't be taken with them, neither given to children because it will affect their bones (bones are formed from Ca).

MECHANISM OF ACTION

Inhibit protein synthesis by binding reversibly to 30 s ribosomal subunit.

Pharmacokinetics

- Long acting à → given orally once per day
- 90 - 100% Absorbed in the s. intestine.
- Protein binding 40-80 %.
- Distributed well, including prostatic tissues
- Cross placenta and excreted in milk.
- Metabolized in liver.
- **Excretion:**
- Doxycycline à → in bile
- Minocycline à → in urine
- **Absorption is impaired by:**
- 1. divalent cations (Ca, Mg, Fe)
- 2. milk and its products
- 3. antacids (aluminium hydroxide gel, sodium bicarbonate)

Spectrum

Broad spectrum (Bacteriostatic) Cause it's reversible.

Clinical uses

UTI's & **chronic prostatitis** due to Mycoplasma Chlamydia.

ADRs

- GIT
- Thrombophlebitis (i.v route)
- Hepatic toxicity (prolonged therapy with high dose).
- Brown discoloration & deformity of teeth (children)
- Deformity or growth inhibition of bones (children)
- Vertigo (minocycline)
- Super-infections (because it's broad spectrum so it kills normal flora & allows other organisms to enter the body).

Contra- indications

- Pregnancy
- Breast feeding
- Children (up to 12 years)

β -Lactam antibiotics

Extended spectrum penicillins

Organism :
Effective against
pseudomonas aeruginosa
& Enterobacter.

Pharmacokinetics:
Penicillinase sensitive can be given in
combination with β -lactamase inhibitors as
clavulanic acid , sulbactam, tazobactam

Side Effects :
Hypersensitivity reaction
up to anaphylactic shock



Cephalosporin's 3ed generation : Ceftriaxone & Cefazidime

Organism :
Mainly effective against
gram- bacteria.

Pharmacokinetics:
Given parentally (I.V.)

Side Effects :
Hypersensitivity reaction



MECHANISM OF ACTION : Inhibit bacterial cell wall synthesis

SPECTRUM : Broad spectrum (**Bactericidal**)

USES : Given in severe / complicated UTIs & acute prostatitis

You can give cephalosporin in penicillin allergic patients but if the allergy is anaphylactic shock then it is contraindicated

Extended- spectrum penicillin's: We can combine:
Amoxicillin with clavulanic acid ...OR... piperacillin with tazobactam

Fluroquinolones

Ciprofloxacin

Levofloxacin



MECHANISM OF ACTION: Inhibits DNA gyrase enzyme

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SPECTRUM: Broad spectrum (Bactericidal)

ORGANISM :

Effective against pseudomonas aeruginosa

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Contraindicated in:

- Adolescent under 18 yrs.
 - Pregnancy.
 - Breast feeding mothers.
-
-



USES:

- Prostatitis
- UTIs caused by multidrug resistance organisms as **pseudomonas**

SIDE EFFECTS

Damage grown cartilage that's why it is contraindicated in children < 18 yrs.

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Pseudomonas Aeruginosa

You are going to hear so much about this bug while working in the hospital. It's VERY resistant to many antibiotic & infect patients with weak immune system. It doesn't affect healthy people! It produces GREEN color in the nutrient agar & It causes so many diseases such as: UTI's pneumonia, endocarditis.



DRUG : Aminoglycosides (gentamycin – tobramycin)



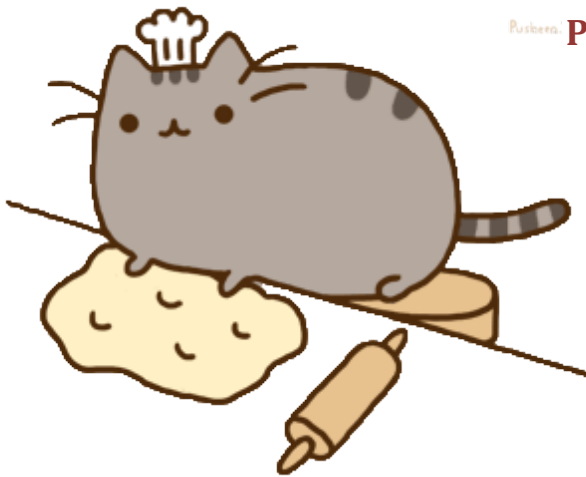
MECHANISM OF ACTION :

Inhibits protein synthesis by binding **irreversibly** to 30S ribosomal subunits.



SPECTRUM:

narrow spectrum (Bactericidal)
(Because it's irreversible).



Pharmacokinetics

1. Poorly absorbed orally > not used orally except in GIT infection
 2. Given I.M, I.V.
 3. cross placenta
 4. Excreted unchanged in urine
 5. More active in alkaline medium
-
-

ORGANISM

Active against gram negative aerobic organisms.

CLINICAL USES

Severe UTIs caused by gram negative aerobic organisms , **gentamicin** is **effective in treating pseudomonal infections.**



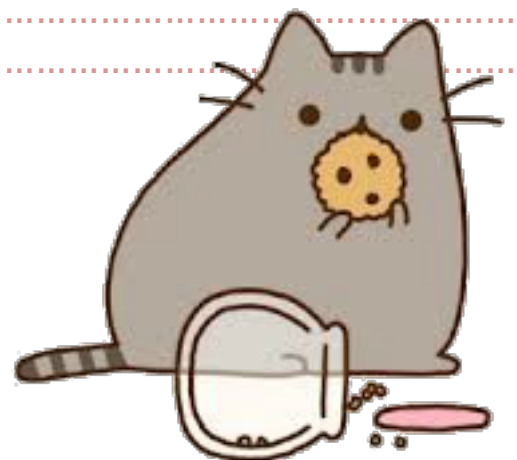
ADRs

TRIAD:

- Ototoxicity >> up to deafness
 - Nephrotoxicity
 - Neuromuscular blocking effect >> curari like action. It shouldn't be given before surgery .
- with anesthesia or it will paralyze the diaphragm muscle & patient will die.
-
-
-
-

Contraindications

- Renal dysfunction
 - Pregnancy
 - Patients with hearing problem (Diminished hearing)
 - Myasthenia gravis >> due to muscular relaxant.
-
-



كنت مسويتها عشان اطبعها واكتب عليها نوتاتي لهذا فيها

سطور ^^

اتمنى تفيد احد

وضحي العتيبي ^^

