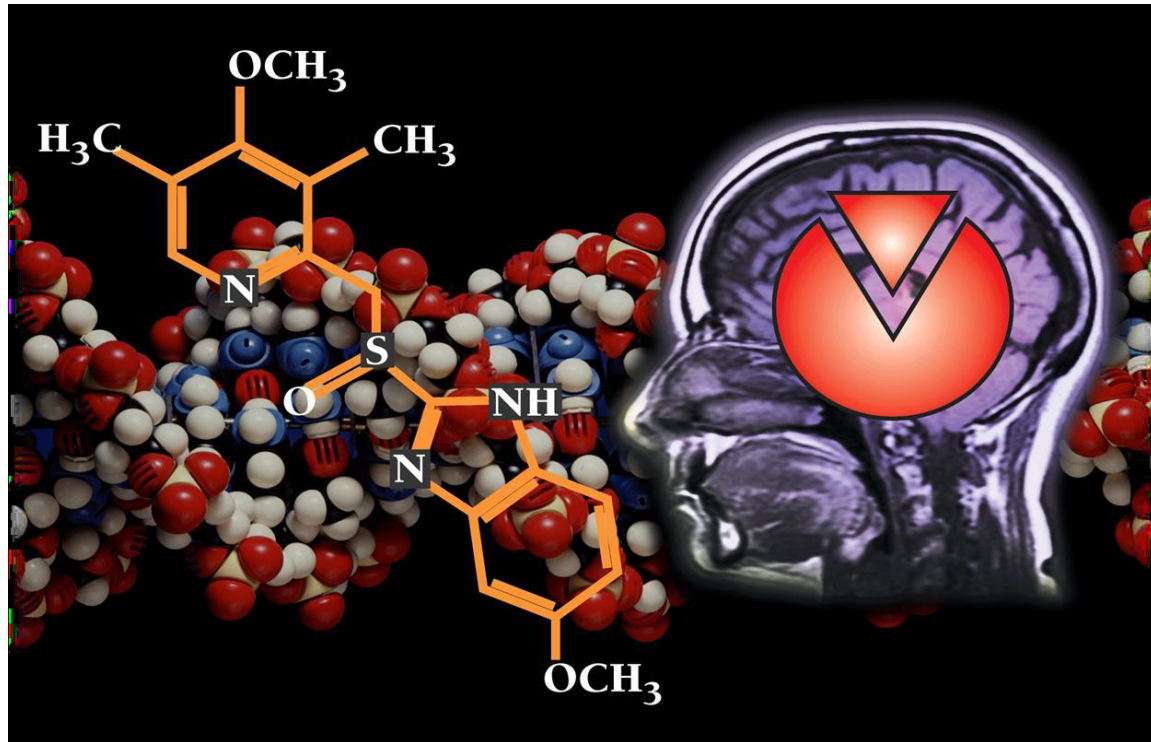


## 08- Treatment of sexually transmitted diseases



Note: Text in red is important.

Done by:

Mohammed Aldohan

Ayshah al-mahboob

## Introduction:

### WHAT IS SYPHILIS ?

Is sexually transmitted disease caused by bacterium **Treponema Pallidum**

### **Treponema Pallidum :**

are helically coiled, corkscrew-shaped.

### Classification of Syphilis:



#### A- primary stage ( a single sore ( a chancre ) )



#### B-Secondary Stage (Skin rash & mucous membranes lesions)

#### C- Latent stage (70% may have NO SYMPTOMS)

#### G-Congenital Syphilis:

If a woman is pregnant and has symptomatic or asymptomatic early syphilis, hematogenously disseminating organisms may pass through the placenta to infect the fetus

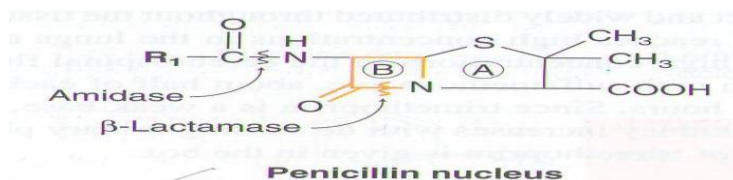
## Therapy of syphilis

### 1-Penicillins ( $\beta$ -lactam antibiotic):

Bactericidal Drugs

### Mechanism of action

Inhibit the synthesis of bacterial cell wall .



### Preparations of penicillins used for treatment of syphilis:

- Penicillin G (IV )
- Procaine penicillin (IM )
- Benzathine penicillin (IM )

## A) Penicillin G:

- Short duration of action ( 4-6 hrs)
- Acid unstable (so it's given IV because it's destroyed by gastric HCL if it is taken orally)
- Penicillinase sensitive (its destroyed by B-lactamase- producing organisms)

**Note:** Bacteria often develop resistance to  $\beta$ -lactam antibiotics by synthesizing beta-lactamase, an enzyme that attacks the  $\beta$ -lactam ring. To overcome this resistance,  $\beta$ -lactam antibiotics are often given with B-lactamase inhibitors such as Clavulanic acid.

## B) Procaine penicillin

- Long acting (24-48hrs)
- Acid unstable
- Penicillinase sensitive

## c) Benzathine penicillin

- Long acting ( every 3-4 weeks)
- Acid unstable
- Penicillinase sensitive

## Adverse effects of penicillins

- **Hypersensitivity** (may lead to anaphylactic shock – we have to do sensitivity test before each dose )
- Nephritis
- Convulsions with high doses or in renal failure

For patients who are allergic to Penicillins : these antibiotics are used instead

## 1-TETRACYCLINES:

- Doxycycline
- Minocycline (acne treatment)
- Well absorbed orally
- Long-acting ( once daily)
- Not effective for treatment of gonorrhea (for syphilis only)

## Mechanism of action

- Bacteriostatic
- Inhibit bacterial protein synthesis by reversibly binding to 30 S bacterial ribosomal subunits .

## Side effects:

### 1- Effects on calcified tissues (discoloration of teeth)&bone deformity

2- Hepatotoxicity

### 3- vestibular problems (vertigo, nausea, vomiting)

4- Phototoxicity (specially in whitish people)

5-gastric upset( nausea, vomiting, diarrhea)

6-Superinfections (because it inhibit the growth of normal flora - we give B complex with it to potentiate the normal flora)

#### Additional notes from the DR.:

- It excreted from bile so it's good for patient with renal failure
- Not given with antacid „Al, or Ca containing products (e.g. milk) because it impair the drug's absorption

## Contraindication:

- Children ( below 10 years)
- Pregnancy (it cross the placenta)
- Nursing mothers (excreted with the milk)

## 2-MACROLIDES (clarithromycin)

### Mechanism of action

Inhibits bacterial protein synthesis **by binding to bacterial 50S ribosomal subunits**

## ADVERSE EFFECTS

- Gastric upset
- Inhibits hepatic microsomal enzyme ( P-450 system )

## 3-Cephalosporins

- $\beta$ -lactam antibiotics
- 3rd Generation cephalosporins :

e.g. cefixime

e.g. Ceftriaxone

### Mechanism of action

- Bactericidal
- Inhibits bacterial cell wall synthesis

## Adverse effects

- Allergic manifestations (if the patient had anaphylactic shock from penicillin usually it will suffer from allergic to cephalosporin )
- Thrombophlebitis (in injection site)
- Superinfection like **Pseudomembranous colitis**. (Given with Vitamin B complex (B1,B2,...etc) usually its given with the broad spectrum antibiotic to avoid superinfection ( it potentiate the normal flora))
- Diarrhea

**Pseudomembranous colitis**, a cause of **antibiotic-associated diarrhea (AAD)**, is an infection of the colon. The use of **clindamycin**, broad-spectrum antibiotics such as **cephalosporins**, or any **penicillin-based antibiotic** such as amoxicillin causes the normal bacterial flora of the bowel to be altered. In particular, when the antibiotic kills off other competing bacteria in the intestine, any bacteria remaining will have less competition for space and nutrients. The net effect is to permit more extensive growth than normal of certain bacteria. *Clostridium difficile* is one such type of bacterium.

## GONORRHEA

Caused by *Neisseria gonorrhoea*, a pus producing bacteria

### Uncomplicated gonorrheal infections (localized) :

### Recommended regimens ( 1st line treatment)

#### 1-Single –dose treatment with 3rd generation cephalosporins :

- 125mg of ceftriaxone, IM
- 400 mg of cefixime , orally

#### 2-FLUOROQUINOLONES

Single oral dose of :

- Ciprofloxacin
- Ofloxacin
- Levofloxacin

### MECHANISM OF ACTION of fluoroquinolones

All are bactericidal

Inhibit DNA synthesis by inhibiting DNA gyrase enzyme

### ADVERSE EFFECTS

- **arthropathy**
- GIT upset (Diarrhea, nausea)
- Headache and dizziness
- phototoxicity

## CONTRAINDICATIONS

- Pregnancy
- Nursing mothers
- Children under 18 years

## Alternative treatment in allergic patients to 1st line treatment

### - Spectinomycin

- 2g IMI ( once )

## Mechanism of action

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

## Adverse Effects

- Pain at the site of injection
- Fever and Nausea
- Nephrotoxicity (not common)

## Complicated gonorrheal infections

Spread through blood stream to:

- EYE
- Joints
- Heart valves
- Brain



- Harmful effects of gonorrhea Newborn eye infections, may lead to blindness
- Adult eye infections, spread on fingers, can lead to blindness

## Treatment of Complicated gonorrheal infections With conjunctivitis in new born

### Silver nitrate

- Its germicidal effects are due to precipitation of bacterial proteins by liberated silver ions
- Put into conjunctival sac once immediately after birth ( not later 1 h after birth )

### ERYTHROMYCIN

- 0.5% ointment for treatment & prevention of corneal & conjunctival infections.
- Put into conjunctival sac immediately after birth ( no later 1 hr after delivery )

## Summery

- **Penicillin** is the first line of **thereby for syphilis** and it's acid unstable and penicillinase sensitive however **3rd generation cephalosporins** is the first line in treatment of **Uncomplicated gonorrheal infections**
- **Penicillin and cephalosporin** inhibit the **cell wall synthesis** of the organism and the main ADRs of them is **hypersensitivity**
- **Tetracycline and Spectinomycin** Inhibit bacterial protein synthesis by **reversibly binding to 30 S bacterial ribosomal subunits** and the main ADRs of tetracycline is discoloration of teeth & bone deformity
- **Macrolides** Inhibits bacterial protein synthesis by **binding to bacterial 50S ribosomal subunits**
- **fluoroquinolones** is treatment of gonorrheal infections and it **Inhibit DNA synthesis** by inhibiting DNA gyrase enzyme the main **ADRs is arthropathy**
- **Treatment of Complicated gonorrheal infections** With conjunctivitis in new born are **Silver nitrate and ERYTHROMYCIN**
- **Tetracycline and fluoroquinolones** are contraindicated in **Pregnancy and Nursing mothers**