Lecture title: Antibacterial Drugs

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3. Inhibitors of bacterial protein synthesis

Streptomycin

It is bactericidal and broad spectrum. It is usually used as dihydrostreptomycin because it is more stable in solutions and has rapid absorption after injection. It is usually combined with penicillin to produce potentiation against bacteria. It is excreted unchanged by the kidney and the therapeutic action last for 12 hours.

Mechanism of action

Inhibits protein synthesis of bacteria.

Side effects

1. Large doses cause hypotension, nephrotoxicity, muscle paralysis, nausea, vomiting and ataxia.

2. Chronic use may cause neurotoxicity especially in cat.

Chloramphenicol

It is bactericidal and broad spectrum drug. It metabolized in the liver and undergoes enterohepatic recirculation.

Mechanism of action

Inhibits protein synthesis of bacteria.

Side effects

1. Aplastic anemia in human due to bone marrow suppression.

2. Anorexia and depression in cats.

3. Inhibits liver microsomal enzymes.

Tetracyclines

Types

Oxytetracycline, doxycycline and minocycline.

It is bacteriostatic but large doses are bactericidal. They are rapidly absorbed orally and the following materials inhibit their absorption which are the food, calcium, magnesium, iron, aluminum and milk. It distributes into different organs of the body including the brain and fetus and excreted by the GIT and the kidney.

Mechanism of action

Interfere with protein synthesis in the bacteria.

Side effects

1. Inhibits the microflora in the GIT of the ruminants.

2. Stains the teeth of the newborn with yellowish color because it binds with calcium.

3. Renal toxicity in high doses.

4. Diarrhea in horses.

Erythromycin

It is bacteriostatic, broad spectrum, induce liver microsomal enzymes and used mainly for upper respiratory tract infections.

Mechanism of action

Inhibits protein synthesis of bacteria.

Clindamycin

It is a derivative of lincomycin and it antagonizes the effects of erythromycin. It is effective against G^+ bacteria and mycoplasma.

Mechanism of action

Inhibits protein synthesis of bacteria.

Side effects

1. Diarrhea.

2. Muscle paralysis.

3. Vomiting in cats.

4. GIT disturbances in horses.

Aminoglycosides

Types

Gentamycin, kanamycin and neomycin.

They are bactericidal and broad spectrum drug. It is poorly absorbed orally and excreted by the kidney.

Mechanism of action

Decrease protein synthesis in the bacteria.

Side effects

1. Ototoxicity.

2. Nephrotoxicity.

3. Muscle paralysis.

4. Respiratory depression especially when used with general anesthetics.

Tylosin

It is bacteriostatic, inhibits bacterial protein synthesis and usually given with oxytetracycline to produce potentiation against bacteria.

Spectinomycin

Inhibits protein synthesis of bacteria.

It is bacteriostatic, relatively broad spectrum and poorly absorbed orally.