Lecture title: Antibacterial Drugs

Lecturer Affiliation: University of Mosul / College of Veterinary Medicine / Department of Physiology, Biochemistry and Pharmacology

Resistance of microorganisms to antibacterial drugs

1. Natural resistance: which means that some bacteria are resistant and other are not which depend on bacterial species.

2. Acquired resistance: this means that sensitive bacteria become resistant after exposure to antibacterial drugs.

Mechanisms of resistance

1. Change in cell membrane permeability which prevents entry of the drug to microorganism (e.g. resistance of G^- bacteria to penicillin).

2. Pumping the drug out of the cell after entry (e.g. Staphylococcus species).

3. Development of enzymes which destroy the drug (e.g. β-lactamase which destroy β-lactam ring of penicillin).

4. Modification of the target enzyme or organelles (e.g. changes in the binding sites to chloramphenicol).

5. Development of alternate metabolic pathway to prevent inhibition by the drug (e.g. some resistant bacteria to sulfonamides used folic acid instead of synthesizing it).

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Principles of antibacterial therapy

1. Diagnose the pathogenic microorganisms.

2. Determine the drug of choice.

3. Consider the bioavailability and distribution of antibacterial drugs.

4. Use the drug of choice.

5. Duration of treatment should be 5-7 days.

6. Monitor the animal for 2 days for clinical response. If there is no response, reconsidered diagnosis and treatment then choose another drug with different mechanism of action.

Advantages of combined antibacterial drugs

1. Serious infections.

2. Mixed bacterial infections.

3. Decrease drug toxicity.

Disadvantages of antibacterial therapy

1. Development of super infection.

2. Development of resistance to antibacterial drugs.

3. Delayed diagnosis.