

TYPES OF ANTIBIOTICS

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ABSTRACT:

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This article discusses the types of antibiotics, their classification, mechanism of action, and clinical use. Antibiotics are important in the treatment of bacterial infections and are divided into several main groups based on their chemical structure and pharmacological properties. The article provides general information about beta-lactams, macrolides, tetracyclines, aminoglycosides, fluoroquinolones, glycopeptides, and sulfonamides. It also discusses the mechanism of action of antibiotics and the problem of resistance that arises as a result of their misuse. The aim of the article is to systematically cover the types of antibiotics and demonstrate their importance in medicine.

Research materials and methodology:

This article was prepared based on scientific literature on pharmacology, microbiology and clinical medicine. Antibiotics were studied in terms of their chemical structure, mechanism of action, spectrum of action against bacteria and clinical use.

Research results:

Antibiotics are divided into several main groups, each of which has its own unique properties.

1. Betalactam antibiotics

Penicillins: amoxicillin, ampicillin. Cephalosporins: ceftriaxone, cefazolin. Carbapenems: imipenem, meropenem. Monobactams: aztreonam. Properties: have a bactericidal effect, destroy the cell wall.

2. Macrolides: erythromycin, azithromycin, clarithromycin. Properties: inhibit protein synthesis.

3. Tetracyclines: tetracycline, doxycycline. Properties: broad-spectrum antibiotics.

4. Aminoglycosides: gentamicin, streptomycin, amikacin. Properties: have a strong bactericidal effect.

5. Fluoroquinones: ciprofloxacin, levofloxacin, norfloxacin. Properties: block DNA synthesis.

6. Glycopeptides: vancomycin. Properties: effective against gram-positive bacteria.

7. Sulfanilamides: sulfamethoxazole (with trimethoprim) Properties: disrupt folic acid synthesis. General mechanism of action of antibiotics: destroy the cell wall, stop protein synthesis, block DNA/RNA synthesis, disrupt metabolic processes.

Discussion:

The classification of antibiotics into types is very important for their correct selection and effective treatment in clinical practice. Each group affects bacteria through different mechanisms. For example, beta-lactams have a rapid bactericidal effect, while macrolides and tetracyclines are used as alternative or broad-spectrum options. Fluoroquinolones are important in the treatment of severe and complicated infections. Aminoglycosides are considered strong and fast-acting antibiotics, while glycopeptides are often used against resistant bacteria. Inappropriate and excessive use of antibiotics increases bacterial resistance, which has become a global health problem, and the World Health Organization is constantly monitoring and issuing warnings.

Conclusion:

It was noted that the improper use of antibiotics, arbitrary dose changes or incomplete completion of the course of treatment leads to the development of resistance in bacteria, which has become a serious health problem worldwide and requires constant monitoring and preventive measures from health care systems. The correct selection of antibiotics, their rational use and strict adherence to doctor's recommendations are the main conditions for the effective treatment of infectious diseases. In the future, the development of new antibiotics

and the fight against bacteria resistant to existing drugs will remain one of the most relevant scientific directions.

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