22. MICROBIAL RESISTANCE TO ANTIBIOTICS

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Introduction. The use of antibiotics (ABs) in the treatment of pathologies caused by microorganisms has saved many human lives, but subsequently, bacterial infections have again become a severe threat due to antimicrobial resistance, causing 1.27 million deaths globally in recent years.

Aim of study. Identifying and studying current data from the field literature regarding the incidence, etiology, mechanisms of development of bacterial resistance and evaluating strategies to counter this problem.

Methods and materials. We conducted a systematic search of the modern literature, using the databases: MedLine, PubMed, Up to Date, Research gate to identify relevant articles with reference to "pathogenic microorganisms", "antibiotics", and "microbial resistance to antibiotics".

Results. Based on the studied literature. We summarized 7 bibliographic sources. The era of antibiotic therapy dates back to 1928, when A. Fleming discovered penicillin. Since then ABs have transformed modern medicine and saved millions of lives. In the 1950s penicillin resistance became a clinical problem, necessitating the development and implementation of new beta-lactam ABs. In 1962 in the USA the first case of methicillin-resistant Staphylococcus aureus was described and the pharmaceutical industry introduced many new ABs to solve the problem. Antimicrobial resistance (AMR) occurs when microbes: develop protective mechanisms to antimicrobial drugs (AMBD), survive exposure to ABs and can be the cause of random mutations, the latter being the consequence of prolonged use of AMBD. A major cause of ABR is the lack of rapid and adequate identification of pathogens, especially in patients with severe infections (sepsis, infective endocarditis, pneumonia, etc.), which leads to the excessive use of broad-spectrum AB, sometimes in inappropriate doses and short duration to eradicate the infection. Another cause is the abuse of AMBD in the treatment of any common cold. Microorganisms resistant to several AMBD can be: extensively multiresistant or totally resistant. Resistant microbes are difficult to treat, requiring higher doses or alternative drugs that can be more toxic and expensive.

Conclusion. Antimicrobial resistance represents a serious danger for patients with critical infections, influencing the effectiveness of treatment, disfavoring the evolution and prognosis of the disease. Prompt and correct differential diagnosis of diseases, implementation of key investigations, appropriate treatment with complete eradication of the infection are essential to counteract this phenomena and protect public health. Preventing the abuse of antimicrobial drugs leads to a significant reduction of microbial resistance to antibiotics facilitating a promising future.