OPEN ACCESS Freely available online

ISSN: 2161-1459
Journal of Clinical & Experimental Pharmacology

Perspective

Antibiotics Pharmacology and their Immune Response

Berihun Yismaw*

Department of Pharmacy, University of North Carolina, North Corolina, United States of America

DESCRIPTION

Antibiotics are common drugs used in modern medicine. Since ancient times, people have sought ways to treatment for various infectious diseases. Various microorganisms such as bacteria, viruses, fungi, and parasites are also having medical importance. Antibiotics are compounds that target bacteria and are therefore designed to treat and prevent bacterial infections. Antibiotics are drugs fight aganist bacterial infections in humans and animals. They work by either killing bacteria or making it difficult for bacteria to grow and multiply.

Antibiotics can be taken orally (by mouth) in the form of tablets, capsules, or liquids. Some antibiotics can be used in the form of cream, spray or ointment that a person can apply on skin and it may be an eye ointment, eye drops, or ear drops and also in the form of Injections. Antibiotics only treat certain bacterial infections such as throat pain, urinary tract infections, and mostly bacterial infections. Antibiotics can cause side effects and contribute to antibiotic resistance, so take them only when necessary. Antibiotic resistance occurs when bacteria change and become resistant to the effects of antibiotics. This means that the bacteria will continue to multiply. For some bacterial infections, a person may not need to take antibiotics. For example, sinus infections and some ear infections may not require it. Taking antibiotics when a person doesn't need them is ineffective and can have side effects. Successful treatment of bacterial infections by using antibiotics is the result of interaction between antibiotics and the host's immune system. Nevertheless, few studies have examined the combined effects of antibiotics and immune responses in clearing infections in the design of antibiotic treatment regimens. There are two extremes in the interaction between antibiotics and immunity. One in which the effectiveness of an immune response in clearing an infection is directly proportional to the density of the pathogen. Another is that the effect does not depend very much on this density. The increased use of antimicrobial agents in clinical practice and other industries such as animal husbandry has resulted in bacterial resistance to antibiotics. Bacteria have evolved mechanisms that promote this resistance to survival.

The Minimum Inhibitory Concentrations (MIC) of a bacterial isolate can be used as a measure of the susceptibility of bacteria to specific antibiotics. A high MIC above the threshold of susceptibility to antibiotics is reported as a resistant infection. Bacteria can develop resistance to antimicrobial agents through intrinsic or acquired properties. Not all antibiotics are effective against all types of bacteria. When bacteria do not contain specific antibiotic targets, they are known to have inherent resistance. Vancomycin, an antibiotic known to target Gram-positive bacteria, cannot cross the cell walls of Gram-negative bacteria. In addition, β-lactam antibiotics require a cell wall to function and are ineffective against bacteria such as Mycoplasma species that lacks cell component. Bacteria also have the ability to acquire resistance, either by acquiring resistance genes from other bacteria or by developing mutations that reduce or eliminate the efficacy of antibiotics. This type of resistance is called acquired resistance.

Bactericidal activity is either concentration dependent or time dependent. Antibiotics such as fluoroquinolones and daptomycin exhibit a concentration-dependent bactericidal action, and the bactericidal effect increases with increasing antibiotic concentration. Penicillins and tetracyclines are time dependent. Therefore, the duration of effective concentration of these antibiotics determines the bactericidal activity. After absorption of antibiotics, distribution affects the degree of antimicrobial activity. The total amount of drug in the body relative to serum concentration is the volume of distribution. The degree of protein binding affects drug availability at the site of infection. When antibiotics are tightly bound to proteins, less free drug is available for antibacterial activity, as seen in patients with hypoalbuminemia. As it increases, the volume of distribution increases. The location of the infection is important because some antibiotics are not suitable for treating certain infections. For example, in the treatment of meningitis, blood-brain barrier penetration is critical for achieving therapeutic levels of antibiotics at the site of infection to prevent treatment failure.

Correspondence to: Berihun Yismaw, Department of Pharmacy, University of North Carolina, North Corolina, United States of America, E-mail: yismaw@hotmail.com

Received: 25-Oct-2022, Manuscript No. CPECR-22-19452; **Editor assigned:** 28-Oct-2022, Pre QC No. CPECR-22-19452 (PQ); **Reviewed:** 11-Nov-2022, QC No CPECR-22-19452; **Revised:** 18-Nov-2022, Manuscript No. CPECR-22-19452 (R); **Published:** 28-Nov-2022, DOI: 10.35248/2161-1459.22.12.341.

Citation: Yismaw B (2022) Antibiotics Pharmacology and their Immune Response. J Clin Exp Pharmacol. 12:341.