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"An Overview of Antibiotics and Their Positive and Negative Effects on Health"

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ABSTRACT
Most antibiotics were discovered by chance. The production of antibiotics can be divided into three methods: natural fermentation, semi-synthetic and synthetic method. Since bacteria are still impervious to antibiotics, the research and development of new antibiotics remains significant. The perfect features of this section have achieved the ability to incorporate antibiotics directly into established strategies, remove antibiotics for direct administration and combine antibiotics with non-antibiotics to achieve results. The increase in the number of antibiotic-resistant bacteria that cause disease has increased the need to fund antibiotic research and development and the desire to produce new and better antibiotics. For more than 2,500 years, people have treated certain skin infections with molds, which are antibiotics. However, modern scientific study of these materials did not begin until the late 19th century AD. At that time, the French chemist Louis Pasteur discovered that bacteria spread infectious diseases. German bacteriologist Robert Koch then developed methods for isolating and preparing different types of bacteria. Koch also identified certain bacteria that cause certain diseases.

KEYWORDS: Antibiotic, Bacteria, Disease, Effect, Microbial, Penicillin

I. INTRODUCTION

Antibioticsare organic substances that producemicroorganisms such as bacteria and fungiduring growth and at low levelsconcentrationto kill or inhibit growthof microorganisms other than organisms who produced them [1-3]. Or they aresubstances produced by many microorganisms(bacteria, fungi) that inhibit growth ofother microorganisms and finally removedthem. Antibiotics can be divided into bothstop the growth of bacteria or be fatal to them. People extend the term to syntheticsantibacterial agents like sulphonamides andquinolones. There are many devices acrossbacteria that fight with an antibiotic, e.g.removing the enzymes that break it down,besides that happensimpervious to bacteriapenicillin"G" ; which accumulates the beta-lactamase enzyme that carries this antibiotic[4-6].Antibiotics are expected for wildlife, for examplescares, also adjusts the flapsthe main aspect of the homesteadsmoreover impenetrable bacterial drainagethese antibiotics affect the human bodywhen they torment their nature beyond milk,such a central aspectimpervious drainage of microorganisms [7-11].

HISTORY OF ANTIBIOTICS

Treatment was based on penicillin earlier for many infectious diseases at the origination of the 20th century medical literature. It is for the treatment of inflammation mentioned in ancient Chinese medicine using plants with powerful properties such as antibiotics. It started to be used more than 2500 years ago. And in many other things ancient cultures including ancient Egyptians, Greeks and Arabs in middle Ages [12-15], mold was used. Eucalyptus bark was an effective treatment against malaria widespread disease in the 17th century Createdby parasites of the genus Biomorphs and using scientific efforts to understand what produce these diseases, the development of synthetic antibiotic chemotherapy and isolation of natural antibiotics, which is animportant development of antibiotics. Vitality, the story of antibiotic chemotherapy launched as a science in Germany with Ehrlich, in the late 19s [16-19]. Dr. Ehrlich noticed that certain pigments can enter and stain human and animal cells and microorganisms, while others do not stain them. Then he proposed the idea that couldbe possible to make some tinctures or chemicals which would act as a magical solution or a selective drug that can

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bind microorganisms and then kill them without harming the host cells. After many experiments and sorting of hundreds of dyes against various organisms, he found a useful drug that is an antibiotic discovered by men. The Discovery of natural antibiotics generated bymicroorganisms' arised from previous work while monitoring antibiotics amongmicroorganisms. Pasteur noted that "if we could resolve the antagonism exists among certain types microorganisms", it can offer best hope for recovery. Bacterial antagonism shown by Penicillium was first marked out by John Tyndall in England in 1875. However, his work did not receive much attention of circles. Scientific, until Alexander Fleming's discovery of penicillin in 1928. Till then, therapeutic potential ofpenicillin was not continued, but more than ten years later, Ernst Chen Howard Florey came in to interested in Fleming's work.Thus, a purified form of penicillin was produced, that had shown a wide range of antibacterial activity againstvarious bacteria with low toxicity to the host which can be ingested without side effects. In addition, unlike sulphonamides, its effect were not inhibited by biological agents likepus defecates. At the time, no one had found a corresponding compound to this activities[20-22]. The discovery of penicillin reawakened interest in quests for compounds of antibiotics with similarskills. Because of the discovery ofpenicillin, Ernst Chen, Howard Florey and Alexander Fleming received the Nobel Prize in Medicine in 1945. In 1939 Rene Dubosisolated gramicidin, one of the first commercially prepared antibiotics used during the Second World War proves to be very effective for treatment of wounds and ulcers. Florey creditedDubos for reviving his penicillin research [23-25].

MECHANISM OF ACTION OF ANTIBIOTICS IN THE BODY

Assessing the effect of an antibioticis critical to the success of antibacterialtreatment. We remember here thatnon-microbiological factors - such as host defence mechanisms, site of infection,underlying disease, pharmacokinetics and pharmacokinetic properties of antibiotics- confound in determination of treatment efficacy and success. Antibiotics are mainly classified as bactericidal, which means they have a killing effect, and bacteriostatic, which means they inhibit their growth. The effect of bactericidal antibiotics is in the phase of bacterial growth and reproduction. In most cases, but not all, the effect of many of these antibiotics depends on the activity of cells and their constant division. ; But practically both can eliminate bacterial infectionCharacterization of the effect ofantibiotics in vitro to evaluate the measurement of the minimum concentration of activity and the minimum inhibitory concentration of bacteria having outstanding antimicrobial and magnificent indicators of antimicrobialpotency [26-29]. Although, inclinical practice, thesemeasurements alone cannot accurately predict clinical outcomes. Combining the pharmacokinetics of the antibioticand the antibacterial activity,several pharmacokinetic parameters appear to be important markers ofdrug efficacy. This activity may be due to the concentration-dependent antibiotic activity and the characteristic increase in antibacterial activity .With progressively higher antibiotic concentrations, it is critical that a minimum inhibitory serum concentration be maintained over a period of time.Oral antibiotics simply means takingby mouth; In more severe cases, intravenousantibiotics are used, sometimes antibiotics can be applied topically to the skin or mucous membranes, such as in creams or eye or nose drops. Antibiotics that targetthe bacterial cell wall (penicillin, cephalosporin) or cell membranes (polymyxin) or inhibitessential bacterial enzymes (quinolones,sulphonamides) are usually bactericidal in nature. Those that target protein synthesis, such as amino glycosides, macrolides, and tetracycline, are generally bacteriostatic. [30, 31]

ANTIBIOTIC RESISTANCE

The emergence of antibiotic resistanceis an evolutionary process that relies onchoosing organisms that enhanced their abilityto survive with doses of antibiotics that werepreviously lethal. The antibiotics likepenicillin and erythromycin that used to bemiracle cures are less effective now, becausethe bacteria are becoming more resistant.Antibiotics themselves perform as a selectivepressure that allows bacterial resistance togrow within the population and inhibitsusceptible germs. The selection of antibioticsfor resistance within bacterial populationsappeared in the 1943 year of the Luria -Delbruck experiment. Often the survival of the bacteria results from the inheritance ofresistance, the risk of antibiotic resistance mayobtrude a biological cost and the spread ofantibiotic resistance has been hampered by the low efficacy associated with resistance, whichproves the deficient survival of the bacteriawhen antibiotics were not present.

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However,additional mutations may offset these costs and efficiency and help these bacteria survive.The overuse of antibiotics like penicillinand erythromycin that used to be one of themiracle cures has been associated withresistance emerging since the 1950s. Thetherapeutic use of antibiotics in hospitals maybe seen to be associated with increasedresistance of bacteria to numerous antibiotics.Habitual types of antibiotic misuse includenot taking the patient's weight and history ofantibiotic use into account before, as both canseverely affect the effectiveness of antibioticprescribing, and not fully taking the prescribedantibiotic.Antibiotic resistance occurs whenmicroorganisms develop the mechanisms thatprotect them from the effect of antibiotics.Resistant microorganisms are more difficult totreat, require higher doses, or need alternativetreatments that may be more toxic, as well asmore expensive. Microorganisms that areresistant to many antibiotics are called multiresistant. All kinds of microorganisms candevelop this resistance ability Fungi developresistance to antifungal, viruses developresistance to antivirals, protozoa developresistance to antivirals, and likewise bacteriadevelop resistance to antibiotics. Resistancearises either naturally through genetic mutations or through the transmission ofresistance from one sex that has procured it toanother sex that has not acquired it yet. It mayalso appear momentarily as a result of geneticmutations, but the use of antibiotics for longperiods seems to stimulate the emergence ofmutations in the genes that cause resistance to In particular. Accordingly, reducing themisuse of antibiotics by not using them exceptwhen they are really needed is an urgentmatter. As for patients who take these drugs athome without consulting a doctor, instructingthem about the correct way to use them is ofutmost importance. Antibiotic resistance isused as a useful tool in the field of geneticengineering. For example, a plasmid is madethat contains the antibiotic resistance gene inaddition to the genes wanted to be translated,in this way the researcher can make sure thatwhen the bacterial cells proliferate, only thebacteria carrying the plasmid can survivewhile the others die due to the effect of theantibiotic. Thus, this method can confirm thatthe wanted genes to be translated aretransmitted through cells when they areproliferated. The antibiotics used in the fieldof genetic engineering are older and are nolonger used to treat patients, such as: Ampicillin, Kanamycin, Tetracycline,and Chloramphenicol. The antibiotic resistance method is not preferred in the industry, one ofthe methods of combating antibiotic resistanceis the development of compounds capable ofinhibiting the mechanisms that allow germs toresist the antibiotic. The most famous exampleof this is the addition of clavulanic acid to thecompound amoxicillin and the production ofthe world-famous composite amoxicillin /clavulanic acid called Augmentin. Thisaddition allowed to inhibit the enzyme beta lactamase, which was produced by somebacteria and was able to completely suppressthe action of amoxicillin [30-32]

SIDE EFFECTS OF ANTIBIOTICS

Antibiotics are generally safe, but they have been linked with several adverse reactions.Depending on the type of antibiotic and the target microorganism, there can be numerous and dangerous side effects.The safety features of newer drugs may not be recognizable as those that have been used for years.Its side effects may include fever, nausea, and severe allergies such as photo dermatitis. The use of antibiotics may be avoided in certain situations, leading to a decrease in infections caused by antibiotic-resistant bacteria. One study found that Fluroquinolones use is clearly associated with Clostridium difficile infection, the leading cause of hospital-acquired diarrhoea in the United States and a major cause of death worldwide.

Vaccines do not have a problem with resistance because the vaccine enhances the body's natural immunity, while the antibiotic works independently of that immunity. Immunity generated by vaccines can be bypassed through the evolution of new bacteria. In the first years, when antibiotics were discovered, they were produced in nature and produced by fungi such as penicillin, which could produce antibiotics, including streptomycin and tetracycline, which produced the most antibiotics. A mutagen, such as ultraviolet or X-ray radiation, is commonly introduced to induce mutation. Selection and more multigenerational propagation of high-producing strains can increase yields 20 times or more, and another method used to increase yields is gene amplification, in which copies of genes encoding enzymes involved in antibiotic production are inserted back to cells by vectors such as plasmids.The retest of antibiotics and this procedure should be closely connected.

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II. CONCLUSION

Despite the significant scarcity of antibiotics, 1% fewer antimicrobial agents assessed therapeutic or profitable ingredients. Antibiotics differ from each other based on many aspects, including: mechanism of action and the types of bacteria they kill (bacteria are usually classified according to shape, ability to live in air, staining ability and other aspects).

Despite being the most powerful weapons in modern medicine, antibiotics lose their therapeutic potential when used inappropriately, leading to bacterial overgrowth or administration without warning, Strains that are resistant to antibiotics, and in some cases resistant to many antibiotics, and the responsibility for this is partly due to the causes. Natural as a result of bacterial adaptation and many of them due to human error in the behaviour of doctors, pharmacists and patients.

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