Advantages and Disadvantages of Using Antibiotics

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Antibiotics are substances of natural or semi-synthetic origin that suppress the growth of living cell of prokaryotic type, or, more often, of the simplest. Antibiotics fight bacteria either by invading bacteria or by weakening them so that the immune system can fight and kill them more rapidly. Some antibiotics have a strong inhibitory effect on the growth and reproduction on bacteria, causing relatively little damage or no damage at all to the cells of the microorganism. In this respect they are effectively used in pharmaceuticals. The history of antibiotics began seventy-six years ago with the discovery of penicillin by Alexander Fleming. The sulphonamides were introduced in 1936. Throughout the 1950s and 1960s in particular, many new classes of antibiotics were developed and put on the market. Examples include the glycopeptides (1958) and the quinolones (1962). Vancomycine is a well-known glycopeptide which is currently used as the last line of defence against the resistant staphylococcus, MRSA (methicillin-resistant Staphylococcus aureus) (Conte, 2002). The current essay intends to discuss advantages and disadvantages of using antibiotics in medicine.

Antibiotics are one class of antimicrobials, a larger group which also includes anti-viral, anti-fungal, and anti-parasitic drugs. They are reasonably harmless to humans, and thus can be used to cure infections caused by bacteria. The term was coined by Selman Waksman, originally described only those formulations derived from living organisms, in contrast to "chemotherapeutic agents", that were synthetic. Antibiotics are normally safe and very helpful in fighting disease, but there are situation where antibiotics can be harmful (Yount, 2004). Despite these side effects, the discovery of antibiotics in the 1940's has transformed medical practise and radically reduced illness and death from infectious diseases. Unlike previous treatments for infections, which included poisons such as strychnine and arsenic, antibiotics were labelled "magic bullets": drugs which targeted disease without harming humans (Yount, 2004). The

development of these antimicrobial drugs fostered the idea that bacteria had been defeated. However, no-one had predicted on the ability of bacteria to (Conte, 2002).

One of the primary concerns of present day medical practise is antibiotic resistance. In other words, if an antibiotic is used long enough, bacteria will mutate that enable it to withstand the antibiotic. This is known as antibiotic resistance. There are many cases of Infections today that are caused by bacteria resistant to some antibiotics. The existence of such antibiotic-resistant bacteria creates the danger of life-threatening infections that don't respond to antibiotics (Whiteman 2010). Today, virtually all important bacterial infections in the United States and throughout the world are becoming resistant. Antibiotic resistance can cause major danger and suffering for children and adults who have common infections, once easily treatable with antibiotics (Whiteman 2010). Humans are dying of bacterial infections that were treatable a few years ago.

Antibiotics are designed to attach to enzymes on bacterial cell walls, either preventing the microbes from replicating or killing them outright. Unless, that is, the bacteria mutate and change their enzymes, thus preventing the drug from attaching (Shnayerson and Plotkin, 2003). One of the reasons for the development of antibiotic resistant bacteria is the overuse and misues of it (Whiteman 2010). Common forms of antibiotic misuse include taking them in unsuitable cases, such as the use of antibiotic for infections caused by virus such as the common cold, and failure to complete course of the antibiotic treatment, typically because the patient feels better before the infecting bacteria is completely eliminated (Yount 2004). Moreover, these practises can result in antibiotic resistance in the bacteria that survive the incomplete antibiotic treatment.

Antibiotic resistance has become a serious problem in both the developed and underdeveloped nations. By 1984 half of the people with active tuberculosis in the United States

had a strain that resisted at least one antibiotic. In certain settings, such as hospitals and some child-care locations, the rate of antibiotic resistance is so high that the normal, low cost antibiotics are virtually useless for treatment of frequently seen infections (Lorian 2005). Another example of selection is Staphylococcus aureus, which could be treated with penicillin in the 1940s and 1950s. Today, nearly all strains are resistant to penicillin.

In addition to causing antibiotic-resistant bacteria, antibiotics also cause some side effects. Side effects however, are varied and range from fever and nausea to major allergic reactions. One of the more common side effects is diarrhea, which results from the antibiotic disrupting the normal balance of intestinal flora. Other side effects can result from interaction with other drugs, such as elevated risk of tendon damage from administration of a quinolone antibiotic with a systemic corticosteroid. Some antibiotics can also interfere with the effectiveness of some birth control pills. Such effects were found to be unusual, and have been studied only for a limited number of antibiotics (Lorian, 2005). Some people may further experience an allergic reaction characterised by rash, itching and in severe cases difficulty breathing.

The future of antibiotic is bleak as many laboratories around the world are seeking safer alternative to curing human diseases. For example in a research conducted at the Hebrew University, a method for controlling bacterial activity without antibiotics was developed. The research showed that it is probable to obstruct with the communication of groups of bacteria thus enabling new ways of treating bacterial infections and disease caused by germs as well as ways to help beneficial bacteria to multiply. A young doctoral student from the Hebrew University named Adel Jabbour has succeeded in synthesizing a modified chemical compound which is similar to the structure of the natural auto inducer-2 that can interrupt the signaling between groups of bacteria. These findings, as well as the emerging acceptance of alternative natural

medicine alternative around the world provides a promising avenue for future treatment of bacterial pathogenic activity without having to rely antibiotic drugs and accompanying disadvantages.

References

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