



Antibiotics: What are they and their Relationship with Superbugs?

Akshay Maniyeri Suresh

Laboratory of Bacterial Genetics, Faculty of Chemistry, Gdansk University of Technology, 80-233 Gdansk, Poland.

INTRODUCTION

Antibiotics are medications that are used to treat illnesses, yet they have given rise to superbugs. Antibiotics are antibiotics that are used to treat illnesses in both animals and people, as well as to kill germs and prevent reproduction. Antibiotics are used to treat a variety of illnesses, including dental, ear, bladder, kidney, and skin infections. They may also come in a variety of forms, including pills, tablets, liquids, creams, and ointments. However, health professionals and environmentalists argue that since these medications are used in agriculture, they have an impact on the environment and human health. Antibiotics induce bacterial resistance in the environment, and superbugs emerge at the same time.

WHAT IS AN ANTIBIOTIC MADE OF?

Penicillin, the first antibiotic used by physicians, was found by chance. Alexander Fleming discovered that a fungal microbe had contaminated a culture supply, resulting in bacteria-free zones, in 1928. He came to the conclusion that the fungus had slowed their development. Since then, other successful human tests have been conducted, making it a medical milestone. Most antibiotics, like penicillin, are based on natural compounds produced by bacteria and fungus. These medications, on the other hand, maybe chemically produced in the lab.

Types of antibiotics

There are several types of antibiotics that can be classified into the following groups:

1. **Penicillins:** Used to treat skin, chest, and urinary tract infections;

2. **Cephalosporins:** Used to treat various infections, especially those more severe such as septicemia and meningitis;
3. **Aminoglycosides:** Commonly used in injectable hospitals as they cause more side effects for more serious diseases;
4. **Tetracyclines:** Used to treat infections, acne, and rosacea;
5. **Macrolides:** useful in treating lung and chest infections, as an alternative to penicillin allergens, and in the treatment of penicillin-resistant bacteria;
6. **Fluoroquinolones:** These are used to treat respiratory and urinary tract infections, but they are very rare because they can cause serious side effects.

Side effects

Antibiotics should only be administered under medical supervision since they might have a variety of negative effects. It is also vital to closely adhere to the doctor's instructions. Some supplements should be consumed on an empty stomach, while others should not. When taking drugs, it's important to read the label carefully and take caution when drinking alcohol since, in many situations, combining them with alcohol increases the risk of adverse effects and exacerbates them. Antibiotics can have the unintended consequence of reducing the effectiveness of birth control tablets. As a result, seek medical guidance on this matter.

Other common effects are Diarrhoea; Nausea; Vomiting; Rash; and Stomachache.

In some cases, fungal infections of the mouth, gastrointestinal tract, and vagina.

If you have any of these serious side effects, seek immediate medical attention: Severe diarrhoea; Abdominal pain and constipation; Blood in the stool; and Fever.

Corresponding Author:

Akshay Maniyeri Suresh, Laboratory of Bacterial Genetics, Faculty of Chemistry, Gdansk University of Technology, 80-233 Gdansk, Poland.

ISSN: 2231-2188 (Print)

ISSN: 2231-685X (Online)

Received: 05.10.2021

Revised: 15.11.2021

Accepted: 25.12.2021

Published: 05.03.2022

How Do Antibiotics Work?

Antibiotics work by killing germs or preventing them from reproducing. The antibiotic works by attacking the bacterial wall and interfering with its reproduction and protein synthesis. It begins working right away when you take the antibiotic, but it gets better after a few days. The majority of antibiotics take 7 to 14 days to work, although this depends on physician advice. It's vital to remember that therapy should not be stopped even if the illness improves. The growth of treatment-resistant bacteria may be aided by overuse or incorrect usage of the antibiotic.

Superbacterial and antibiotic resistance

When antibiotics are taken incorrectly, they are ineffective against a certain kind of bacteria, which improves your immunity and leads to the development of a superbug. This is a serious threat to human health. Antibiotic resistance, for example, causes 38,000 fatalities and 3.2 million hospital days in Thailand each year. In India, more than 58,000 newborns die each year as a result of bacterial illnesses spread by their mothers. Other variables promote bacterial resistance, in addition to misuse or incorrect use of antibiotics in patients: Antibiotics are used in agriculture to treat clinical disorders in animals, as well as to prevent and control common infections and boost animal growth.

Because 70% to 90% of antibiotics are released in the urine and faeces of animals, this usage of pharmaceuticals has an effect on the environment. As a consequence, soil and water get contaminated, and superbugs grow more prevalent. Research in Tanzania, for example, discovered that microbes were found everywhere throughout the nation. Superbugs made approximately half of the germs found in pets. Despite the fact that they are not exposed to antibiotics, they do come into touch with superbugs in the environment.

Antibiotics used in agriculture contaminate the human body via the consumption of animal products such as meat, in addition to polluting the environment. In this context, the United Nations (UN) issued a report in 2019 advocating for action to avoid the drug problem. If left unchecked, drug activity, according to the organization responsible for the report's release, might result in 10 million fatalities per year by 2050. The 2017 Borders study also warns about superbugs, saying that antibiotic usage would rise by 23 percent this century, and that medication use in livestock will rise by 67 percent by 2030. Even on a small scale, improper removal may pollute the environment and contribute to the development of bacterial resistance. Antibiotics disposed of in public or private garbage may have major repercussions, such as contaminating surface water and infiltrating the aquatic ecosystem. In this scenario, returning the medicines