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Introduction

Fleming (1928) began to sort through Petri dishes containing colonies of Staphylococcus, bacteria that cause boils, sore throats and abscesses. He noticed something unusual on one dish. It was dotted with colonies, except for one area where a blob of mold was growing. The zone immediately around the mold—later identified as a rare strain of Penicillium notatum—was clear, as if the mold had secreted something that inhibited bacterial growth, which is now known as antibiotics.

Antibiotic is a drug used to treat bacterial infections. It has no effect on viral infections. Originally, an antibiotic was a substance produced by one microorganism that selectively inhibits the growth of another. Synthetic antibiotics, usually chemically related to natural antibiotics, have since been produced that accomplish comparable tasks. But some medications that used to be standard treatments for bacterial infections are now less effective or don't work at all because of misuse.

Current Status of Resistance in Selected Bacteria

In a survey conducted by the world health organization (WHO), information was obtained on the resistance to antibacterial drugs commonly used to treat infections caused by seven bacteria of international concern. The chosen bacteria are causing some of the most common infections in different settings; in the community, in hospitals or transmitted through the food chain. The main findings are summarized in the below tables:

Table 1: Shows bacteria commonly causing infections in hospitals and in the community.

Name of bacteria	Examples of typical diseases	No. out of 194 Member States providing data	No. of WHO regions with national reports of 50% resistance or more
Escherichia coli -vs 3 rd gen. cephalosporin's -vs fluoroquinolones	Urinary tract infections, blood stream infections	86 92	5/6 5/6
Klebsiella pneumoniae -vs 3 rd gen. cephalosporins -vs 3 rd carbapenems	Pneumonia, blood stream infections, urinary tract infections	87 71	6/6 2/6
Staphylococcus aureus -vs methicillin "MRSA"	Wound infections, blood stream infections	85	5/6

Table 2: Shows bacteria mainly causing infections in the community

Name of bacteria	Examples of typical diseases	No. out of 194 Member States providing data	No. of WHO regions with national reports of 50% resistance or more
Staphylococcus pneumoniae - non-susceptible or resistant to penicillin	Pneumonia	67	6/6
Nontyphoidal Salmonella -vs fluoroquinolones	Foodborne diarrhea, blood stream infections	68	3/6
Shigella species -vs fluoroquinolones	Diarrhea (bacillary dysentery)	35	2/6
Neisseria gonorrhoea -vs 3 rd gen. cephalosporins	Gonorrhoea	42	3/6

Impact of Antibiotics Misuse

Medically misuse of antibiotics can lead to:

1. Resistance

Superbugs are bacteria resistant to one or more antibiotics, and they make it difficult to treat or cure infections that once were easily treated. The antibiotic has lost its ability to control or kill bacterial growth. Now, they no longer respond to traditional antibiotics.

It is thought that superbugs developed from the excess use of antibiotics in livestock when they were unnecessary. However, the biggest problem with antibiotic misuse people. Antibiotic misuse (such as taking them when you don't need them or not finishing all of your medicine) is considered to be the top factor contributing to this problem.

2. Killing the good bacteria or experience side effects

Antibiotics may alter the effectiveness of other medications and cause side effects or allergic reactions, like rashes or swelling. Antibiotics can kill most of the bacteria in the body that are sensitive to them, including good bacteria. Good bacteria help to digest food or maintain a healthy balance in the throat or genital tract. By destroying the bacterial balance, it may cause stomach pain, diarrhea, nausea, or other problems. In women, antibiotics often cause a vaginal yeast infections and may reduce the efficacy of birth control pills.

3. Spending money on a drug that won't make you feel better

Although antibiotics kill bacteria, they are not effective against viruses. Therefore, they will not be effective against viral infections such as colds, most coughs, many types of sore throat, and influenza (flu).

Economic Impact :

Antibiotics are helping drive up drug and hospital costs: The further antibiotic resistance spreads, the more often common antibiotics—including many available as generics—must be retired. This means that ridding patients of infection requires longer, more expensive forms of therapy.

Prevention

• Only use antibiotics when prescribed by a certified health professional.



• Never demand antibiotics if the health worker did not recommend it.



• Always follow the health workers advice when using antibiotics.



• Never share leftover antibiotics.



Recommendations

You can help reduce the development of antibiotic resistance if you:

- Avoid pressuring your doctor to give you an antibiotic prescription.
- Practice good hygiene, to avoid bacterial infections.
- Make sure you and your children receive recommended vaccinations.
- Don't stop taking an antibiotic as soon as you feel better. But the full treatment is necessary to kill the disease-causing bacteria.

ANTIBIOTICS DON'T FIX EVERYTHING
Your health professional will advise you when they will work for you

References

- 1) Medicine net. (2018). Antibiotic Resistance (Drug Resistance, Antimicrobial Resistance) (Online) Available at: <https://www.medicinenet.com/script/main/art. Asp ? articlekey =8121>
- 2) Mayo clinic. (2018). Antibiotics: Are you misusing them.(Online) Available at: <https://www.mayoclinic.org/healthy-lifestyle/consumer-health/in-depth/antibiotics/art-20045720>
- 3) acs.org.(2019).Discovery and Development of Penicillin.(Online) Available at: <https://www.acs.org/content/acs/en/education/whatischemistry/landmarks/flemingpenicillin.html#alexander-fleming-penicillin>
- 4) apps.who.int. (2014). ANTIMICROBIAL RESISTANCE Global Report on Surveillance.(Online) Available at : http://apps.who.int/iris/bitstream/handle/10665/112642/9789241564748_eng.pdf;jsessionid=3B113D93C2C69A851CCE44BDBEA62F7E?sequence=1
- 5) Christian H. Caicedo, MD. L (2016). 3 Dangers of Antibiotic Misuse. (Online) UPMC Pinnacle. Available at: <https://www.pinnaclehealth.org/wellness-library/blog-and-health-wise/blog-home/post/3-dangers-of-antibiotic-misuse> [Accessed Wednesday, December 7, 2016]
- 6) Brian Krans.L. (2015). 5 Frightening Consequences of Overusing Antibiotics. (Online) Available at: <https://www.healthline.com/health-news/five-unintended-consequences-antibiotic-overuse-031114#2>[Accessed March 11, 2014]
- 7) WHO.(2019).Antibiotic resistance.(Online) Available at: <https://www.who.int/news-room/fact-sheets/detail/antibiotic-resistance>
- 8) Mayo clinic. (2018). Antibiotics: Are you misusing them.(Online) Available at: <https://www.mayoclinic.org/healthy-lifestyle/consumer-health/in-depth/antibiotics/art-20045720>