



Antimicrobial Resistance: A Global Growing concern

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Abstract

Antibiotic discovery, one of the greatest discoveries of mankind has saved countless lives. Despite their powerful action, their inadvertent and unregulated led to a global crisis known as antimicrobial/ antibiotic resistance. This has led to serious consequences as many susceptible bacteria are not responding well to even a high concentration of antibiotics. Although various strategies are implemented across the globe, concerted efforts are needed otherwise we will probably enter a post-antibiotic era where simple infections can kill humans or animals. On one end, newer promising antibiotics are not developed at the pace, we are misusing antibiotics on the other side. So, the present article in short describes antibiotic resistance and steps to carb down this problem at various levels of organizations.

Introduction

Antibiotics are drugs that are used to treat diseases caused primarily by bacteria, but also in certain fungal and protozoal infections. They are truly powerful drugs, but cannot cure all ailments. Before the discovery of antibiotics, humans and animals succumbed to various diseases and died. Alexander Fleming discovered the first antibiotic, penicillin, about eighty years ago in 1928. The discovery of antibiotics has brought a revolution in the world and has saved countless lives. Although word antibiotics warrant their strict use against bacterial diseases in humans and animals; they are being used in viral infections in most parts of India and probably across the globe. The question is- are we using it properly? – T14+7he answer is **NO**. This has led to the emergence

of a much more dreadful condition known as “Antibiotic/Antimicrobial Resistance” (AMR). In simple words, antibiotic resistance represents the ineffectiveness/less ineffectiveness of an antibiotic in treating certain infections. In detail, it represents conditions in which bacteria itself and not human beings or animals became less responsive to antibiotics. Excessive, inadvertent use of antibiotics and poor infection prevention and control are the main reasons responsible for antibiotic resistance. Scientists were aware of antibiotic resistance for a long time, but the problem is now becoming serious. The misuse of antibiotics by mankind has accelerated the process, otherwise, it is a natural phenomenon. The problem of antimicrobial resistance exists across the globe and

growing concern about antibiotic use has been raised. The problem can become a threat to public health, food security, and future developments. The World Health Organization has estimated almost millions of deaths in human and animal populations in the next few years if the inappropriate use of antibiotics is not restricted in time. Now a days, most human diseases are caused by antibiotic-resistant bacteria, and infections like pneumonia, tuberculosis, gonorrhoea, and salmonellosis are becoming difficult to treat. Antibiotics are also inadvertently prescribed, misused, and overused in veterinary practice too. This led to several diseases in humans due to antibiotic-resistant bacteria found in animals. In addition, it increases medical costs, increases hospital stay duration, and associated mortality. Therefore, we should strictly use antibiotics both in medical science and veterinary practice. Behaviour change is of prime importance to tackle this problem, even new medicines are developed in nearby future. As a solution to this, you need to be aware of its proper use, and inculcating behavioral actions like reducing the spread of infections through vaccination, hand washing, and good food hygiene will help to curb this problem warranting your and your animal's health in the future.

Steps/Action accelerating the problem of antimicrobial resistance

1. Unnecessary use of antibiotics for simple fever, sore throat or mild pain.
2. Use of antibiotics without prescription.
3. Incomplete course/ discontinuation of antibiotic therapy.
4. Irregular use of antibiotics in terms of dose, and dosing intervals.
5. Frequent changes in medical practitioners and lack of adequate treatment records.
6. Use of leftover medicine of closed ones.
7. Following unhygienic practices that favor the spread of infectious diseases.
8. Use two or three antibiotics in at lower than the standard recommended dose.
9. Incorrect administration of antibiotics.

10. Use of antibiotics of low potency produced by sub-standard or fake companies.
11. Lack of awareness among the general public and lack of nationwide awareness campaign.

Action that helps to reduce the problem of Antimicrobial Resistance

The problem of antimicrobial resistance needs the concerted effort of individuals, communities, and nations to reduce its future occurrence and will probably prevent millions of deaths as per estimates by WHO.

As an individual:

1. Use antibiotics considering their dose and dosage regimen after getting prescribed by a certified physician.
2. Don't force health care providers to prescribe antibiotics unless they prescribe it for you.
3. Always consult a physician before changing or using any alternative antibiotics.
3. Keep a record of antibiotics used to avoid repeated use.
4. Follow cleaning and sanitation practices to reduce the incidence of infection and associated antibiotics use.
5. Don't use leftover or expired medicines of closed ones.

As a Health care Provider:

1. Prescribe and use antibiotics only when required as per the standard guidelines.
2. Counselling each patient regarding antibiotic use is necessary. More counseling is required for animal rearers, and pet lovers in relation to the dosing regimen of veterinary drugs as much information in this field is yet to be explored.
3. Advice patients to spread awareness amongst societal members.
4. Prevent infection by following clean, and hygienic practices during work operations at hospitals or dispensaries.

5. Keep a record of antibiotics used and of resistance developed to a certain antibiotic and report it to the consulting body for further action.
6. Advise patients on various steps to prevent infections like vaccination, frequent cleaning of hands, and food hygiene etc.
7. If you are a veterinary practitioner, advise owners to follow the drug withdrawal period and not to consume raw animal products. Usually, the withdrawal period is written on the bottle of every antibiotic.

As a Policy Makers

1. Conduct regular and proper surveillance to check any antibiotic-resistant infections prevailing in society.
2. Formulate and keep surveillance on a developed national plan to tackle the problem. Regularly update the action plan in relation to changing scenarios.
3. Ensure proper use and disposal practices are followed by hospitals, pharmacies, and consumers.
4. Advise and spread the message about the impact of antimicrobial resistance through various mass and digital media platforms.
5. Seek intergovernmental and private partnerships with others for more widespread coverage of the program.

Steps to be taken by Agriculture and allied sector

- 1, Administer antibiotics to the animals under veterinary supervision and if advocated by a veterinary practitioner.
2. Avoid the use of antibiotics as a growth promoter or to boost immunity in animals.
3. Ensure time-to-time vaccination of animals and use antibiotic alternatives whenever feasible.
4. Take steps to ensure good production practices at production and processing levels on the farm.
5. Avoid infection and its spread to other animals by following hygienic practices at the farm.

As a Pharmaceutical/ Healthcare industry

1. Regulate market on the antibiotic use. Don't allow pharmacists and patients to use antibiotics without a prescription from a physician.
2. Invest more time and material resources in the development of newer antibiotics, vaccines, and other health-safeguarding tools for the betterment of human and animal lives.

As a Regulatory Authority

1. Formulate strict guidelines and punish those who violate them for the misuse of antibiotics.

Conclusion

Antibiotic resistance has become a global concern. Various strategies are implemented. Although we are aware of it, we are not following the necessary practices which have accelerated the natural course of antimicrobial resistance development. Before we enter into the post-antibiotic era where simple infections will probably take humans or animal's lives, concerted effort as an individual, health care provider, policy maker, and drug market regulator. So, a small step in this direction will certainly have a good impact on our future.