

Preventing Antimicrobial Resistance Together

BY MALKI EPASINGHE

World Antimicrobial Awareness Week (WAAW) is a global campaign declared by the World Health Organization, from 18 to 24 November each year, to increase awareness of Antimicrobial Resistance in the world. The campaign aims to promote best practices among the public, healthcare workers and policymakers to avoid the further emergence and spread of antimicrobial resistance. In celebration of the WAAW, the Communication and Media Unit and the Faculty of Medicine of the University of Kelaniya in collaboration with the Sri Lanka College of Microbiologists have organised a campaign to reach out to the public to improve awareness and understanding of this issue. This is a discussion with Dr C. Nadisha Badanasinghe, Senior Lecturer of the Dept. of Medical Microbiology, on how to tackle this growing problem.

What are Antimicrobials and Antibiotics? What's the difference?

Antimicrobials are a group of drugs that we use to treat infections caused by different types of microorganisms like bacteria, viruses, fungi and parasites. It includes antibiotics, antivirals, antifungals and antiparasitics. Antibiotics, the most commonly used type, are effective only against infections caused by bacteria, and not against infections caused by any other microbes like viruses.

What is antibiotic resistance?

Antibiotic resistance occurs when the bacteria develop the ability to defeat the effects of antibiotics that are designed to kill them. So, despite the treatment with antibiotics, the bacteria survive and multiply. The antibiotics will not be able to kill the resistant bacteria.

Just like every organism in this world trying to survive and multiply, bacteria too, survive by changing their genetic structure to withstand the antibiotic pressure. We are the ones who help them to change their genes, by applying pressure on them, and by using antibiotics unnecessarily. This process of adaptation or evolution of bacteria only happens in the presence of antibiotic pressure, and the bacteria are far ahead of humans in terms of evolution, as they have colonised and survived on earth a billion years before us.

When the genetic structure of the bacteria is changed, the antibiotics can no longer identify the bacterial cells. Also, sometimes bacteria with these genetic mutations produce deactivating enzymes which can destroy and nullify the effects of antibiotics. Further, the bacteria share these mutated genes with other bacteria which results in the spread of the 'resistant' to all other bacteria very quickly.

Why is it a global concern?

Antibiotics are a very important group of drugs. Due to our misuse and overuse of them, bacteria adapt to become resistant to them. And these resistant genes spread very quickly among so many bacteria. Around 5 million people suffered from at least one infection due to drug-resistant bacteria and had caused 1.27 million deaths in 2019. In the same year, one in five deaths in children under the age of five years was attributable to antibiotic-resistant infections. Estimates show that by 2050, a patient will die every three seconds from infections due to resistant bacteria, accounting for 10 million annual deaths. Antibiotic resistance is higher in developing countries than in developed countries, especially in the Southeast Asian region. The reason for this is the lack of sufficient regulations and the high misuse of antibiotics.

Furthermore, the antibiotic pipeline is dry. The discovery and production of new antibiotics is an extremely slow process. Penicillin was first discovered in the 1920s.



Dr. C. Nadisha Badanasinghe



It is everyone's responsibility as policymakers, doctors, pharmacists, the public and livestock farmers, to work together to prevent antibiotic resistance and preserve the effectiveness of antibiotics. As the theme of this year's Antimicrobial Awareness Week declared by the WHO; "Preventing Antimicrobial Resistance Together.", this issue can only be resolved by working together collaboratively through a One Health approach. So, let us be determined to save antibiotics together for future generations

Compared to that era, pharmaceutical companies nowadays are not interested very much in the discovery and research of new antibiotics. Since newly discovered antibiotics will also be ineffective after a few years of their misuse, it may cause these companies a huge loss of their investment. When compared to the increased rate of resistance development by the bacteria, we are far behind in terms of 'new discoveries' of antibiotics which ultimately results in us losing the battle. We are moving towards an era where we will not have any effective antibiotics in the near future. That's the reason why it is a global health issue.

What accelerates the emergence and spread of antibiotic resistance?

The misuse and overuse of antibiotics are the main reasons why antibacterial resistance increases. As long as we use antibiotics unnecessarily, the bacteria will keep becoming resistant. If we use antibiotics correctly, only when indicated in bacterial infections, we can protect and preserve the effectiveness of antibiotics. We can preserve the effectiveness of antibiotics if we do not apply unnecessary pressure on bacteria.

Why is it important to preserve antibiotics?

As I mentioned previously, there will be no newly discovered

antibiotics in the near future. So, we will have to save the effectiveness of the existing antibiotics. Some bacteria are already resistant to all the antibiotics available now. It is very difficult and sometimes impossible to treat resistant infections, therefore people will die of day-to-day infections. This is why we have to save and preserve the effectiveness of antibiotics for future generations. Antibiotics have saved millions of lives. Now it's the time for us to save the antibiotics, our lifesavers.

Who is responsible for the prevention of antimicrobial resistance? Is it solely the responsibility of the public?

The responsibility for the prevention of resistance and the preservation of the effectiveness of antibiotics lies with so many parties. Firstly, the prescribers, the people who prescribe antibiotics like medical doctors, veterinary doctors and dental doctors have a great responsibility. Only the doctors who are qualified in western medicine should prescribe the correct antibiotic only for the correct indication, in the correct dosage, frequency and duration. The next responsible party is the pharmacists who dispense antibiotics. They should not issue antibiotics without a valid, doctor's prescription. They should also make sure the prescription is issued by a qualified doctor and is recently dated. In addition, the responsibility of the public is to take the antibiotics that are prescribed to them properly. They have to adhere to the instructions given to them and take the proper dose, at the proper time intervals, for the proper duration. Also, they should not take any antibiotics from previous prescriptions, leftover antibiotics or antibiotics prescribed for another person. The responsibility also falls on the Health Ministry, Drug Regulation Authority and other responsible authorities to procure quality antibiotics for the country. Finally, livestock farmers and aquaculture farmers should not use large quantities of antibiotics in sub-therapeutic doses as growth promoters in animal feeds. They should only use antibiotics with the proper advice from a veterinary doctor.

Could you tell us what best practices the public needs to be aware of and practice to minimise this global threat?

As we all know, prevention is better than cure. For prevention, you can practice infection prevention techniques like washing hands regularly, wearing masks if you have any symptoms of an infection, minimising contact with others, and 'cough etiquette' etc. Also, antibiotics are not necessary and will not be effective for minor illnesses like stomachaches, colds and sore throats, because these symptoms mainly appear due to viruses. Antibiotics are not necessary for all fevers. Further, the public should not misuse antibiotics as previously mentioned. The more we use antibiotics, the more we are going to 'lose them'.

Finally, what message would you like to share with everyone?

It is everyone's responsibility as policymakers, doctors, pharmacists, the public and livestock farmers, to work together to prevent antibiotic resistance and preserve the effectiveness of antibiotics. As the theme of this year's Antimicrobial Awareness Week declared by the WHO; "Preventing Antimicrobial Resistance Together.", this issue can only be resolved by working together collaboratively through a One Health approach. So, let us be determined to save antibiotics together for future generations.

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