



## The first World Antibiotic Awareness Week On Antibiotic Resistance

B H N Yasmeen<sup>1</sup>

*"The time may come when penicillin can be bought by anyone in the shops. There is the danger that the ignorant man may easily underdose himself and by exposing his microbes to non-lethal quantities of the drug make them resistant."-- Alexander Fleming at his 1945 Nobel Prize lecture.*

The discovery of penicillin by Alexander Fleming in 1928 took the world of medical science in to a new era. Antibiotics have saved millions of lives since they were first introduced in 1940s. But because of the overuse and inappropriate use or not completing the course of antibiotics, many antibiotics are no longer effective against the bacteria they once killed i.e the microbes became antibiotic resistant.

Only by half a century, now antibiotic resistance has become one of the biggest threats to global health. All around the world, antibiotic resistance is putting the achievements of modern medicine at risk. Without effective antibiotics for the prevention and treatment of infections, organ transplantations, chemotherapy and surgeries like simple abscess drainage to caesarean sections become much more difficult for the doctor. Many common infections are becoming resistant to the antimicrobial medicines used to treat them, resulting in longer illnesses and more deaths.

WHO defines antimicrobial resistance as a microorganism's resistance to an antimicrobial drug that was once able to treat an infection by that microorganism.<sup>1</sup> A person cannot become resistant to antibiotics. Resistance is a property of the microbe, not a person or other organism infected by a microbe.<sup>2</sup>

Now some important causes of antibiotic resistance will be discussed here in short to understand the appropriate measure to be taken to reduce or prevent the antibiotic resistance.

Resistance can happen spontaneously owing to random mutations, to a buildup of resistance over time, or to misuse of antibiotics<sup>3</sup> although the latter cause is most important.

From the beginning of the antibiotic era, antibiotics have been used to treat a wide range of disease. Since then not only overuse, underuse and misuse

of medicines also contribute to this problem.

Up to half of antibiotics used in humans are unnecessary and inappropriate.<sup>3</sup> For example, common cold (virus is the cause) is the most common reason where antibiotics are prescribed<sup>4</sup> even though antibiotics are useless against viruses. In an analysis of drug prescriptions, 36% of individuals with a cold or an upper respiratory infection (both viral in origin) were given prescriptions for antibiotics.<sup>5</sup> These prescriptions accomplished nothing other than increasing the risk of further evolution of antibiotic resistant bacteria.

Moreover uncontrolled sale in many low or middle income countries, where antibiotic can be obtained over the counter without a prescription, potentially resulting in antibiotics being used when not indicated.<sup>6</sup> This may result in emergence of resistant bacteria.

Increasing bacterial resistance is linked with the volume of antibiotic prescribed, as well as missing doses when taking antibiotics.<sup>7</sup>

Antibiotic use in livestock feed at low doses for growth promotion is an accepted practice in many industrialized countries and is known to lead to increased levels of resistance.<sup>8</sup> Eighty percent of antibiotics sold in the United States are used on livestock. The majority of these antibiotics are given to animals that are otherwise healthy. These sub optimal doses of antibiotics in healthy animals causes the emergence of antibiotic-resistant microorganisms.<sup>9</sup>

In many countries drug quality assurance systems are weak. This can lead to poor quality medicines, exposing patients to sub-optimal concentrations of antimicrobials, thus creating the conditions for drug resistance to develop.

Poor infection prevention and control can increase

Editorial

<sup>1</sup> Prof. Dr. B H Nazma Yasmeen  
MBBS, MCPS, MD (Paed)  
Editor  
Northern International  
Medical College

Professor & Head  
Dept. of Paediatrics  
Northern International  
Medical College, Dhaka  
email :  
prof.nazma.yasmeen@gmail.com

the spread of drug-resistant infections. Hospitalized patients are one of the main reservoirs of resistant microorganisms. Patients who are carriers of resistant microorganisms can act as a source of the same resistant infection for others.

The growth of global trade and travel allows resistant microorganisms to be spread rapidly to distant countries and continent.<sup>10</sup> Moreover, WHO points out that no new classes of antibiotics are on the horizon—the last one appeared 25 years ago.

At this situation the first ever World Antibiotic Awareness Week was observed from 16-22 November 2015 by the World Health Organisation (WHO). Its key theme, 'Antibiotic handle with care' has brought antibiotic resistance of microorganism into a sharp focus. The campaign aims to increase awareness of global antibiotic resistance and to encourage best practices among the general public, health workers and policy makers to avoid the further emergence and spread of antibiotic resistance.

'Antibiotic handle with care'-implies that antibiotic, the friend in need become inactive if we are not handle it properly. Therefore Antibiotics should only be used when needed and only when prescribed by health professionals.<sup>11</sup> When antibiotics are being prescribed, the prescriber should closely adhere to the five rights of drug administration: the right patient, the right drug, the right dose, the right route, and the right time.<sup>12</sup>

Like other countries antibiotic resistance is also quite a serious issue in Bangladesh. Indiscriminate use of antibiotics is taking a heavy toll on the health of this nation. This worse situation is borne out by the findings in several studies conducted in our country.<sup>13-15</sup> These studies showed that traditional antibiotics will not work in treating their simple diseases.

All pharmacies across the country used to sell antibiotics without any prescriptions. Most often patients take it on their own or on being advised by relations and friends.

At this context the purpose of the first World Antibiotic Awareness Week would be successful if the public and health professionals jointly make an effort to reduce indiscriminate use of antibiotics. Mass awareness campaign should be undertaken by the concerned health departments across the country round the year about the wrong uses of antibiotics and their harmful effects. For general people who will be self-administering these medications, emphasis must be placed on education about proper use of the antibiotic.

In practice, health care providers should try to minimize spread of resistant infections by using proper sanitations techniques including hand washing or disinfecting between each patient, and should encourage to do the same by the patient.<sup>16</sup>

Shorter courses of antibiotics are likely to decrease rates of resistance, reduce cost, and have better outcomes with fewer complications.<sup>17</sup> Health care providers should practice short course regimens which are available for community acquired pneumonia,<sup>18</sup> middle ear infections, sinusitis and throat infections etc.<sup>13</sup> Beside this narrow-spectrum antibiotics should be used rather than broad-spectrum antibiotics when possible to effectively and accurately target specific organisms.<sup>17</sup> Cultures should be taken before

treatment when indicated and treatment potentially changed based on the susceptibility report.<sup>16</sup> All these effort will ensure "Antibiotic handle with care" successfully and reduce the rate of antibiotic resistance.

Regarding this issue World Health Assembly also endorsed the Global Action Plan on antimicrobial resistance last year where member states were urged to develop national plans on antimicrobial resistance by May 2017. At the end of 2015, five countries have already finalized their National Antimicrobial Resistance plan which includes Australia, Cambodia, Fiji, Philippines and Vietnam.

Therefore it is the high time for Bangladesh Government to prepare the National Antimicrobial Resistance Strategy to guide the response to the threat of antibiotic misuse and resistance. The strategy should focus on the measures to prevent antibiotic resistance as well as decrease inappropriate use of antibiotics across all sectors where antibiotics are used.

## References

1. "Review on Antimicrobial Resistance". amr-review.org. Retrieved 20 May 2016
2. "What is Drug Resistance?". www.niaid.nih.gov. Retrieved 2015-07-26
3. "General Background: About Antibiotic Resistance". www.tufts.edu. Retrieved 2015-10-30.
4. McNulty CA, Boyle P, Nichols T, Clappison P, Davey P (August 2007). "The public's attitudes to and compliance with antibiotics". *J. Antimicrob. Chemother.* 60 Suppl 1: i63–8. doi:10.1093/jac/dkm161. PMID 17656386.
5. Scales, David. "Mapping Antibiotic Resistance: Know The Germs In Your Neighborhood". WBUR. National Public Radio. Retrieved 8 December 2015
6. Goossens H, Ferech M, Vander Stichele R, Elseviers M (2005). "Outpatient antibiotic use in Europe and association with resistance: a cross-national database study". *Lancet.* 365 (9459): 579–87
7. Allison E. Aiello; Elaine L. Larson; Stuart B. Levy (2007). "Consumer Antibacterial Soaps: Effective or Just Risky?". *Clinical Infectious Diseases.* 45 (Supplement 2): S137–47. doi:10.1086/519255. PMID 17683018.
8. The Lancet Infectious Diseases Commission. Antibiotic resistance—the need for global solutions. *Lancet Infect Dis* 2013;13: 1057–98.
9. "1.6.9". Access online: OIE - World Organisation for Animal Health. www.oie.int. Retrieved 2015-11-14
10. World Health Organisation Medicines: rational use of medicines. 2010. Available at: www.who.int/mediacenter/factsheets/fs338/en/index.html. accessed on June 7, 2010.
11. Swedish work on containment of antibiotic resistance—Tools, methods and experiences (PDF). Stockholm: Public Health Agency of Sweden. 2014. pp. 16–17, 121–128. ISBN 978-91-7603-011-0.
12. "The Five Rights of Medication Administration". www.ihl.org. Retrieved 2015-10-30.
13. B H N Yasmeen, S Islam, S Islam, M M Uddin, R Jahan. Prevalence of urinary tract infection, its causative agents and antibiotic sensitivity pattern : A study in Northern International Medical College Hospital, Dhaka. 2015; 7 (1) ;105-109.
14. Hamida K, Fahmida M, Shafiullah A. Z. M., Farhana M. Prevalence and comparative likelihood of urinary tract infection among female out patients in BSMMU. *Bangladesh J. Zool.* 2012 40(2): 231-239
15. Rahman F, Chowdhury S, Rahman MM, Ahmed D, Hossain A. Antimicrobial Resistance Pattern of Gram-negative Bacteria Causing Urinary Tract Infection. *S J Pharm Sci.* 2009;2(1):44-50.
16. "CDC Features – Mission Critical: Preventing Antibiotic Resistance". www.cdc.gov. Retrieved 2015-07-22.
17. "Duration of antibiotic therapy and resistance". NPS Medicinewise. National Prescribing Service Limited trading, Australia. 13 June 2013. Retrieved 22 July 2015.