

Need for Rational use of Antibiotics

Dr Rakesh Kumar

Associate Professor, Department of Pharmacology

Punjab Institute of Medical Sciences

Jalandhar, Punjab, India

Antimicrobials, the wonder drugs have saved millions of lives since 1928; when Penicillin was first discovered by Sir Alexander Fleming. For many decades after the first patient was treated with antibiotics, these drugs have played a pivotal role in achieving major advances in medical field. They helped to decrease morbidity, mortality and extended the life expectancy by changing the outcome of bacterial infections. The alarm regarding its overuse was first raised way back in 1945 by Sir Alexander Fleming. He warned that the "Public will demand [the drug and] then will begin an era of abuses".^[1] Antibiotics have been helping us to treat and prevent life threatening infections, since then. Millions of antibiotic doses have been used to save lives. WHO and various other health policy making agencies time and again stressed on the need of optimal use of these drugs, however, rampant overuse, misuse and irrational use have resulted in emergence of resistance. Some of these microorganisms have become extremely deadly which are termed as "superbugs". Carbapenem-Resistant Enterobacteriaceae (CRE), Multidrug-Resistant Acinetobacter, Neisseria gonorrhoeae, Methicillin-resistant Staphylococcus aureus (MRSA) and Clostridium difficile are a few common Antibiotic-Resistant bacteria that have become resistant to the majority of available drugs and challenging to treat. A 70 year old Nevada woman died of septic shock due to Carbapenem Resistant Enterobacteriaceae (CRE) infection. According to the report by Centers for Disease Control and Prevention, CRE was resistant to 14 kinds of antibiotics available in the hospital and later test revealed more alarming results that the bacteria was resistant to all 26 antibiotics

available in USA. Around 7 lakh people die worldwide each year due to drug resistant infections. Many public health organizations have described the rapid emergence of resistant bacteria as a "crisis" or "nightmare scenario" that could have "catastrophic consequences". WHO projected the casualty number to cross 10 million by 2050 and the world could be running out of options to treat common infections.

Poor infection control measures, choice of higher antibiotics to treat simple infections, improper treatment indications, prolong duration of antibiotic therapy and lack of new drug development add to the woes.^[2,3] Very few countries are monitoring antibiotic use, its availability as over the counter drugs and lack of antibiotic policies to encourage appropriate antibiotic usage led to irrational antibiotic use. Blood transfusions, contact with bodily fluids, sexual intercourse, and even through skin-to-skin contact can result in the transmission of these resistance strains. The only way to prevent its spread is to limit contact with another person's blood or bodily fluids, and proper washing of hands after coming into close contact with someone. As the crisis of antibiotic resistance continues to worsen across the globe, new emphasis is being placed on "antibiotic stewardship." Antibiotic stewardship is the process of ensuring that antibiotics are used appropriately. In order to improve the quality of antibiotics prescribing, this programme should be followed in all tertiary care centers and data obtained must be shared with primary and secondary health care centers. Recently India's apex medical research body, Indian council of Medical Research (ICMR) issued first ever Antimicrobial treatment guidelines based on

Indian antimicrobial resistance data from domestic healthcare settings. To further strengthen the fight against growing drug resistance, World Health Organization has given a new advisory in its 20th list of Essential Medicines March 2017,^[4] in which antibiotics have been grouped into 3 categories - Access, watch and reserve. Access includes drugs such as Amoxycillin that have lower potential for resistance and available at all times for most common infections. Watch antibiotics are second choice drugs that should be used only for a small number of infections eg. Ciprofloxacin, used to treat uncomplicated cystitis and upper respiratory tract infections. The reserve group contains last resort drugs such as Colistin and some new generation cephalosporin that should be used for life threatening infections involving multidrug resistant bacteria. With these changes the further development of drug resistance can be reduced and the effectiveness of "drug of last resort" be preserved.

These measures would help in selection of appropriate drug in right dose and for right duration. It will help to prevent resistance, minimize the toxicity and maximize the beneficial effects. Coordinated efforts to implement new policies, renewing the research, placing strict regulatory measures to check their availability as over the counter drugs are the need of the hour. Strict sterilization and prescription protocols must be followed by clinicians to ensure rational use of antibiotics. These protocols will help and guide healthcare institutions to rationalize the antibiotic usage and prevent further deterioration of the current situation.

References

1. Fleming A. Penicillin's finder assays its future, New York Times, 1945, vol.21.
2. Spellberg B, Gilbert DN. The future of antibiotics and resistance: a tribute to a career of leadership by John Bartlett. Clin Infect Dis 2014;59(suppl2):S71-5.
3. Bartlett JG, Gilbert DN, Spellberg B. Seven

ways to preserve the miracle of antibiotics. Clin Infect Dis 2013;56(10): 1445-50.

4. WHO model list of essential medicine. 20th list. March 2017. Available at: <http://www.who.int/medicines/publications/essentialmedicines/en>.

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