Antibiotic Resistance: A Serious Global Public Health Threat

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The global public health concern for the antibiotic resistance is not a future issue; it is happening right now in every region of the world and has the potential to affect anyone, of any age, in any part of the world. New WHO reports, with data from 114 countries provides the comprehensive picture about the situation. Antibiotics have been extensively misused in both humans and food-producing animals in ways that favour the selection and spread of resistant bacteria. Without a global policy on usage of antibiotics, the world is headed for post-antibiotic era, which is deadly even with minor infection or injury. In his Nobel Prize speech in 1945, Alexander Fleming, who discovered penicillin, warned that bacteria could become resistant to these remarkable drugs.

The WHO report, "Antimicrobial resistance: global report on surveillance", observed very high rates of resistance to antibiotics in bacteria that cause common health-care associated and community-acquired infections (e.g. urinary tract infection, pneumonia) in all WHO regions.[1] The results are cause for high alarm, documenting resistance to antibiotics, especially "last resort" antibiotics, in all regions of the world. The high proportions of resistance to 3rd generation cephalosporins reported for E. coli and K. pneumoniae means that treatment of severe infections likely to be caused by these bacteria in many settings must rely on carbapenems, the lastresort to treat severe community and hospital acquired infections. Carbapenam resistant Klebsiella pneumonia has spread to all regions of the world and fluoroquinalone resistant E.coli is now very widespread. More than 1 million people are infected with gonorrhoea around the world every day. Treatment failure to the last resort of treatment for gonorrhoea, the third generation cephalosporins has been confirmed in Australia, Canada, France, Japan, Norway, Slovenia, South Africa, Austria, Sweden and the United Kingdom. Reduced susceptibility to penicillin was detected in S. pneumoniae in all WHO regions, and exceeded 50% in some reports. Globally, 3.6% of new TB cases and 20.2% of previously treated cases are estimated to have multi-drug resistant TB (MDR-TB), with much higher rates in Eastern Europe and central Asia. MDR- TB is largely under-reported, compromising control efforts. The treatment success rate was lower in extensively drug-resistant (XDR-TB) cases.

One review of community-acquired neonatal and infant sepsis in developing countries concluded that, because of resistance, a significant proportion of the causal bacteria were treatable neither by the recommended first-line regimen nor by alternative cephalosporin treatment.[2] The first strains of methicillin-resistant Staphylococcus aureus (MRSA) emerged during the 1960s. Initially, MRSA was mainly a problem in hospital-acquired infections. Luckily, many of these community-acquired MRSA strains have so far retained susceptibility to a number of non-betalactam antimicrobials, whereas most health-care associated MRSA infections are caused by multi-resistant strains, which is difficult to treat.

Antibiotic resistance not only increases the mortality but also increases the cost of health care with lengthier stays in hospital and more intensive care required. Some estimates of the economic effects of antibiotic resistance have been attempted, and the findings are disturbing. Because anti-microbial resistance has effects far beyond the health sector, it was projected nearly 10 years ago, to cause a fall in real gross domestic product (GDP) of 0.4% to 1.6%, which translates into many billions of today's dollars globally.

The pipeline for the development of new antibiotics is now virtually empty, particularly for the treatment

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of Gram-negative enteric bacteria, and research on treatments to replace antibacterial drugs is still in the early stages.

How to fight antibiotic resistance

The development of resistance is a normal evolutionary process for bacteria, but it is accelerated by the selective pressure exerted by widespread use of antibiotics. Basic machinery is needed at all part of the glob to track and monitor the antibiotic resistance, which is poor or lacking at present in many countries. Prevention of infection is very effective rather than treating infection with antibiotics, which can be achieved through better hygiene, access to clean water, infection control in health-care facilities, and vaccination. The new rapid test Xpert MTB/RIF can play an important role in combating drug resistance in TB. Xpert MTB/RIF is an automated assay for the simultaneous detection of TB and rifampicin resistance directly from sputum in less than 2 hours.

As per WHO report, antibiotic resistance can be tackled by an integrated approach from various levels. The common people can help tackle resistance by: using antibiotics only when prescribed by a doctor; completing the full prescription, even if they feel better; never sharing antibiotics with others or using leftover prescriptions.[1] Health workers and pharmacists can help tackle resistance by: enhancing infection prevention and control; only prescribing and dispensing antibiotics when they are truly needed; prescribing and dispensing the right antibiotic(s) to treat the illness. The Policy-makers can help tackle resistance by: strengthening resistance tracking and laboratory capacity; regulating and promoting appropriate use of medicines. Policymakers and industry can help tackle resistance by: fostering innovation and research and development of new tools; promoting co-operation and information sharing among all stakeholders.

END NOTE

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