EDITORIAL

CHALLENGES OF BACTERIAL DRUG RESISTANCE IN DEVELOPING COUNTRIES

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Antibiotics play a critical role in reducing the burden of communicable diseases all over the world. The discovery of penicillin was followed by an extraordinary progress in research related to antibiotics and their extensive use. Many antibiotics are now available as primary weapons in mankind's battle against infectious diseases. They revolutionized medicine, providing cures for earlier life threatening diseases and preventing many formerly inevitable deaths from infections. However, drug resistance threatens the effectiveness of the treatments of infections and has been a public health issue with national and global dimensions. This issue remains a great concern and one of the greatest challenges to health care professionals as well as those involved in drug discovery and development. The fear is that many bacteria will become resistant to all antibiotics, plunging humanity back into the conditions that existed before the pre-antibiotic era.

In developed countries, where the burden of infectious diseases is modest, the decreasing effectiveness of first line antibiotics is also overcome by more expensive second and third line antibiotics supported by active surveillance and timely intervention system for newly emerging drug resistance strains. However, the situation is worst in developing countries like India, Bangladesh, Pakistan, Nigeria, Brazil and other Asian and African countries. Massive, uncontrolled and injudicious uses of antibiotic have posed immense selection pressure on bacterial species, resulting in the emergence and dissemination of highly resistant bacterial strains.

Multidrug resistant organisms in developing countries can also directly affect and threaten more developed countries because international travel driven by globalized trade allows for easier dissemination of these strains. For example, penicillin-resistant and multidrug resistant pneumococcal strains, like serotype 23F clone have been found not only in Mexico, South Africa, South Korea, and Croatia but also in Portugal, France and the United States.

Some of the major poverty-driven factors contributing to antibiotic resistance in developing countries are the following. First, antibiotics without prescription and counterfeit products of uncertain quality are widely available. Second, antibiotic drug resistance is usually not monitored owing to lack of surveillance networks, laboratory capacity, and appropriate diagnostics, leading to the prevalence of incomplete and inadequate data on the true extent of the problem of drug resistance. That is, complete data on resistance in such countries come from tertiary care facilities with very little information in other settings, almost none in rural areas. Third, lack of adequate hygiene,

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poor water quality, and failure to manage human waste pose marked obstacles. Fourth, lack of money makes the purchase of appropriate, high quality medications difficult. Fifth, antibiotics used for animals in disease treatment, prevention, and growth promotion are a case in point. That is, treatment and prevention usually involve high doses of antibiotics for short periods. On the other hand, antibiotics used for animal growth enhancement are generally given in low doses for long periods. This use of low dose antibiotics for long times is highly likely to cause resistance. Food animals are the major reservoir of drug resistant bacteria and present the main risk for the dissemination and transmission of antimicrobial resistant bacteria in Africa as well as many other developing countries. One of the reasons may be that a large number of people in developing countries live in close proximity with animals, increasing the chances of the transmission of resistant microorganisms from animals to humans through animal handling.

Therefore, the problem of drug resistance should not be underestimated, but rather urgent and coordinated actions are required at all levels to ensure the preservation of these life-saving drugs for future generations. To alleviate this public health problem, responsible bodies should provide the necessary guidance for using antibiotics more responsibly in the human, animal and agricultural sectors. The search for new antibiotics should go hand in hand with infection prevention and control activities by fostering the appropriate use of existing and future antibiotics through antibiotic stewardship measures.

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