
Po-Ren Hsueh

The World Health Organization (WHO) has recently announced that the global phenomenon of antimicrobial resistance will be the theme of World Health Day 2011. The campaign, which aims to safeguard medicines for future generations, will call on governments around the world to implement policies to prevent the emergence of highly resistant "superbugs".

Asia remains the epicenter of resistant superbugs. In Taiwan, there is an alarmingly high prevalence of penicillin-resistant Streptococcus pneumoniae, community-acquired and hospital-acquired methicillin-resistant Staphylococcus aureus (MRSA), extended-spectrum β-lactamase-producing Escherichia coli and Klebsiella pneumoniae, multidrug-resistant and extensively drug-resistant Pseudomonas aeruginosa and Acinetobacter baumannii, as well as penicillin- and fluoroquinolone-resistant Neisseria gonorrhoeae. Fluoroquinolone-resistant E coli and Salmonella species, particularly S enterica serotype Choleraesuis, are found not only in humans but also in animals. Azole-resistant Candida species, especially C glabrata, are prevalent in hospitals throughout Taiwan. In addition, the persistence of multidrug-resistant and the emergence of extensively drug-resistant Mycobacterium tuberculosis pose great challenges to public health.

Community-acquired MRSA clones including ST59-MRSA-SCCmec type IV-spa type t437, ST30-MRSA-SCCmec type IV-spa type t019, and ST72-MRSA-SCCmec type IV-spa type t324 predominate in Asian countries. Previously established hospital-acquired MRSA strains including sequence type (ST)239 and ST5 clones have been found among community-acquired MRSA isolates from patients without any risk factors for hospital-acquired MRSA infection. Community-acquired MRSA clones such as ST59, ST30, and ST72 have also been isolated from patients with hospital-acquired infections. Various MRSA clones have spread between the community and hospitals as well as between countries. A few extensively drug-resistant A baumannii clones have disseminated throughout most hospital settings in Asia. Even more alarming is the recent emergence in Taiwan of carbapenem-resistant Enterobacteriaceae, including those possessing New Delhi metallo-β-lactamase-1 and K pneumoniae carbapenemase.

Antimicrobial resistance has struck at the core of infectious disease control worldwide. Although antimicrobial-resistant pathogens can be found throughout the world, antimicrobial resistance is of particular concern in countries where prescription of antimicrobial agents is unregulated and where antibiotics are widely available over the counter. The increased use of antibiotics in the
agriculture and food animal industries is also consistent with the rise in antimicrobial resistance among human and animal pathogens. Antimicrobial resistance is also facilitated by the inappropriate use of medicines, such as taking sub-standard doses or not finishing a prescribed course of treatment. Low-quality medicines (generic or counterfeit drugs), inappropriate prescriptions, and poor infection prevention and control measures also contribute to the development and spread of drug resistance. Lack of government commitment to address these issues, poor nationwide surveillance, and a diminishing arsenal of tools to diagnose, treat, and prevent bacterial infections, also hinder the control of drug resistance.

On World Health Day 2011, the WHO will call for action to halt the spread of antimicrobial resistance by introducing a six-point policy package to policy-makers and planners, the public and patients, practitioners and prescribers, pharmacists and dispensers, and the pharmaceutical industry worldwide. The organization strongly recommends that governments focus control and prevention efforts in four main areas: (1) surveillance of antimicrobial resistance; (2) rational antibiotic use; (3) introduction or enforcement of legislation related to stopping the selling of antibiotics without prescription; and (4) strict adherence to infection prevention and control measures, including the use of hand-washing measures, particularly in healthcare facilities.

Reversing the trend in antimicrobial resistance will require continuous survey of resistance data from clinical isolates from humans as well as from animals. Effective implementation of antibiotic stewardship programs and strict infection control policies in healthcare settings are mandatory. Better antibiotic stewardship is needed to limit the emergence of antibiotic resistance, prolong the effectiveness of currently available agents, improve patient outcomes, and reduce healthcare and societal costs. Furthermore, a national policy should be implemented to limit the availability of antibiotics in drug stores without physicians’ prescriptions and also restrict antibiotic use in animal husbandry. Governments, academic societies, industries, and patient organizations need to work together to overcome the increasing threat of antimicrobial resistance.

References