Antimicrobial resistance

Insights from the declaration of World Alliance Against Antibiotic Resistance

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Antimicrobial resistance (AR) is a growing public health threat of broad concern to countries and multiple sectors.[1] According to Nathan and Cars,[2] Alexander Fleming and Howard Florey sounded the first warning regarding AR during their 1945 Nobel Prize for the discovery of penicillin. Serious infections caused by multi-drug and pan-drug resistant bacteria in the face of dry pipeline of new antibiotics make practicing modern medicine of enormous challenge. It is estimated that at a minimum of 25000 patients in Europe, and 23000 in the USA die each year from infections caused by antibiotic-resistant bacteria.[3] Development and dissemination of AR is directly related to the amount and the pattern of antibiotics we prescribe in our daily practice. A national surveillance of AR among gram-positive bacteria in the Kingdom of Saudi Arabia (KSA) revealed high resistance among *Staphylococcus aureus* (methicillin-resistant *S. aureus*: 32%), coagulase-negative staphylococci (oxacillin: 63%), and pneumococci (penicillin G - 33%; erythromycin - 26%; ceftriaxone - 11%).[4] The Gulf Cooperation Council (GCC) States share a high prevalence of extended-spectrum-β-lactamase (ESBL) and carbapenemase-producing gram negative bacilli, most of which are associated with nosocomial infections.[5] In the latter study, the rate of ESBL *Escherichia coli* (*E. coli*) and *Klebsiella* in different regions of KSA ranged from 4.8-29% for *E. coli*, and 3.2-64% for *Klebsiella*, while the rate was 14% for carbapenem-resistant *Enterobacteriaceae*, and 5-20% for *Pseudomonas*.

The World Alliance Against Antibiotic Resistance (WAAAR) is a nonprofit organization open to professionals and consumers worldwide. It constitutes a group of 700 individuals from 55 different countries representing all the key stakeholders (physicians, veterinarians, microbiologists, surgeons, pharmacists, nurses, evolutionary biologists, ecologists, environmentalists, and patient advocacy groups).[3,6] The Alliance receives support from more than 140 scientific societies or professional groups throughout the world. Among the supporters is the Saudi Society of Medical Microbiology and Infectious Diseases.

The WAAR declaration was published in June 2014 to actively promote preservation of existing antibiotics, and raise awareness among prescribers, politicians, and policy-makers, patient safety and advocacy groups, pharmaceutical industry, international organizations and general population.[6] The declaration advocates 10 actions to combat antibiotic resistance: 1) spreading awareness of all the stakeholders and the general public to AR threat; 2) establishing a national plan by the Ministers of Health, or regulatory bodies in each country for the containment of AR; 3) continuous access to antibiotics of established quality, especially in middle and low income countries; 4) integrated surveillance of AR and antibiotic consumption; 5) use of diagnostic tests; 6)antimicrobial stewardship; 7) educational

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efforts for cultural change; 8) infection prevention to contain bacterial spread; 9) basic and applied research and development of new antibiotics; and 10) request for UNESCO to include the "concept of antibiotic" in the list of the intangible cultural heritage. In 2014 September 18th, the United States President's Council of Advisors on Science and Technology (PCAST) released a report to the President, Combating Antibiotic Resistance. The report was linked to an executive order from US President Barack Obama, who directed the National Security Council to work with a governmental task force and a non-governmental advisory council to develop a national action plan by February 2015.[2]

Detecting, preventing, and controlling antibiotic resistance requires strategic, coordinated, and sustained efforts. It also depends on the engagement of governments, academia, industry, healthcare providers, the general public, and the agricultural community, as well as international partners. Committing to combating antibiotic-resistant microbes will support patient care, economic growth, agriculture, and economic and national security.

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