

Infection Control and Antibiotic Resistance Status: The Lebanese Situation



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classically defined as hospital-acquired infections but, more recently, many of these infections are emerging as community-acquired infections, which complicates the situation further. The overuse of antibiotics in humans and in animals as well as poor infection prevention and control are the main risk factors leading to spread of multi-drug resistant organisms.

Without urgent action, we are heading for a post-antibiotic era, in which simple common infections such as pneumonia or urinary tract infections can kill once again.

Prevention and Control

Multiple factors play a role in the emergence of antibiotic resistance. The simple use of antibiotics is the main key driver of resistance; that is why these drugs should be used only when needed to treat bacterial and not viral infections. Steps can be taken at all levels in order to limit the spread of bacterial resistance and reduce the impact of such infections within our community.

Individuals

It is essential not to use antibiotics unless prescribed by a healthcare professional. Preventing infections by washing hands as often as needed, preparing food following hygienic principles, avoiding exposure to sick individuals and keeping vaccinations up to date are essential measures that play a key role in decreasing the risk of contracting infectious diseases illnesses.

Healthcare Professionals

According to WHO, 30% of hospitalized patients at any given time receive antibiotics; up to 50% of these prescriptions are either unnecessary or inappropriate. In

addition, 50 to 70% of nursing home residents receive systemic antibiotic each year and up to 75% of these are prescribed incorrectly according to CDC reports. In a Lebanese study (Saleh, 2015), it was shown that in 52% of cases, the prescription dose was inappropriate while 63.7% of physicians prescribed antibiotics with wrong duration of treatment. In another report evaluating self-medication use of antibiotics within the Lebanese population (Khalifeh, 2017), 62.7% of participants bought antibiotics without prescription and 83.6% of antibiotics were used inappropriately. Therefore, urgent actions should be taken to optimize antibiotic prescription.

Infectious Diseases Societies as well as International Health Organizations worldwide have implemented new strategies to prevent antimicrobial resistance through an Antimicrobial Stewardship Program (AMP). It consists of coordinated interventions to improve and measure the appropriate use of antibiotics by promoting the selection of the right antimicrobial drug regimen, the right dose, the right duration of therapy and the right route of administration, in order to optimize patient safety, reduce bacterial resistance, and decrease healthcare costs.

Implementing AMP in our healthcare institutions is a necessity to overcome the alarming increase in bacterial resistance. A multidisciplinary team which should include infectious diseases specialists, healthcare epidemiologists, infection control professionals, clinical microbiologists, clinical pharmacologists with preferable infectious diseases training, and other specialists from different clinical departments must all collaborate on a daily basis and implement antibiotic treatment guidelines and recommendations within each institution.

Strengthening infection control practices by ensuring hand washing, instruments' sterilization and clean environment are important to decrease rates of healthcare-related infections that are usually due to resistant bacteria. Physicians should follow clinical guidelines when prescribing antimicrobial treatment and always report antibiotic resistant infections to infection control team in order to track bacterial surveillance and avoid the spread of healthcare associated infections.

Educating patients regarding how to prevent infections such as promoting vaccination and hand washing are important steps to decrease the risk of infections.



Introduction

Antibiotics are drugs used to treat bacterial infections. Bacteria have the ability to develop resistance to these antibiotics and continue their proliferation leading to treatment failure. Good Infection Control practices limit the spread of these resistant bacteria, and therefore preventing patient mortality and morbidity. Antibiotic prescription regulations are very essential and need to be urgently implemented because the continuous abuse of antibiotics induces further bacterial resistance and limits treatment options.

Scope of the Problem

Antibiotics are among the most commonly prescribed drugs in developing countries including Lebanon. Inappropriate antibiotic prescriptions induce rapid development of antimicrobial resistance, which is nowadays an alarming global healthcare threat. Bacteria can acquire multiple mechanisms of resistance to one or various classes of antibiotics and become multidrug resistant. Infections with resistant bacteria are harder to treat leading to higher medical costs, prolonged hospital stays and increased mortality. Multidrug resistant bacterial infections are

Spreading antibiotic awareness within the community and discussing with patients about when and how to take antibiotics correctly are essential approaches to adopt at the community level.

Policy Makers

The lack of appropriate regulations in the sales of antibiotics is a driving factor of resistance in developing countries. In Lebanon, antibiotics can still be purchased without medical prescription in many pharmacies. Strengthening antibiotic prescription policies is a key factor to limit antibiotics abuse and better control the risk of inducing bacterial resistance. Improving surveillance of antibiotic-resistant infections and implementing the antimicrobial stewardship program along with infection prevention and control measures across all healthcare institutions will definitely help in decreasing bacterial resistance rates on the long term. Making information available for public is also important for awareness and educational purposes; these will ensure sustainability in individual behavioral change.

Healthcare industry

The healthcare industry including pharmacology and research laboratories can invest in research and development of new antibiotics, vaccines, diagnostics and other tools in order to prevent and control the spread of antibiotic resistance.

Multidisciplinary Approach to Antimicrobial Stewardship
Source: Adapted from Public Health England (2015b)



GPs: General Practitioners
NICE: The National Institute for Health and Care Excellence
CCGs: Clinical Commissioning Groups
AMR: Antimicrobial Resistance

Agriculture Sector

One of the most important actor that play a major role in antibiotic resistance is the abuse of broad-spectrum antibiotics in animals. To prevent and control the spread of antibiotic resistance, the agriculture sector can restrain the use of antibiotics under veterinary supervision and not use antibiotics to prevent diseases in healthy animals. Vaccination of animals to reduce the need of antibiotics and use limited spectrum antibiotics when needed should be under clear regulations. Promoting and applying standardized practices at all steps of food production and processing from animals and plants sources is very important to improve the biosecurity in all our farms and prevent infections through improved hygiene and animal welfare.

Conclusion

The government of every country should consider the Antimicrobial Stewardship Program as a public health priority issue. Detecting, preventing, and controlling antibiotic resistance requires strategic, coordinated, and sustained efforts. In parallel, strengthening infection control practices in all healthcare institutions and agriculture sector is important to promote health safety and avoid further bacterial resistance damage. Successful implementation depends on the commitment of governments, academia, industry, healthcare providers, the public, and the agricultural community, as well as international partners.



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