Bad bugs, need drugs

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The increasing number of multi-antibacterial drug-resistant infections worldwide and the diminishing number of new antibacterial drugs in development with the potential to treat these infections represent one of the world's greatest health threats. The World Health Organization (WHO) has supported this premise, identifying antimicrobial resistance as one of the three greatest threats to human health. Two recent reports, one by IDSA and another by the European Centre for Disease Prevention and Control (ECDC) and the European Medicines Agency (EMEA), demonstrate that there are few candidate drugs in the pipeline to treat infections due to highly-drug-resistant bacteria. The ECDC/EMEA report, for example, found only 15 antibacterial drugs with systemic administration in the development pipeline and only five of these had progressed to clinical trials to confirm clinical efficacy (Phase III or later). Unfortunately, based on past experience, we know that few of these drugs are likely to make it to market. Resistance to the current library of antibacterial drugs is a serious problem in all parts of the world including the Asia-Pacific region, Latin America, Europe and North America. Accordingly, the disincentives for financial commitment to antibacterial drug development are a global problem (1).

In figure 1 you can find declining antibacterial approvals (over past 25 years).

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The time has come for a “Global Commitment to Develop New Antibacterial Drugs” to address the emerging disaster caused by the confluence of increasing bacterial resistance and a stagnant antibacterial drug pipeline. Despite the good faith efforts of many individuals, professional societies, governmental agencies, and philanthropic groups, the looming crisis has only worsened over the past decade. The problem only can be solved by bringing together global political, scientific, industry, economic, intellectual property, policy, medical and philanthropic leaders to discuss and commit to a sustainable antibacterial drug research enterprise.

The immediate goal should be the development of “10 novel antibacterial drugs by 2020”. Key to
advancing antibacterial drug development is the concomitant need to advance the development of improved diagnostic tests specific to multi-drug-resistant infections (2).

Health authorities do not have good figures on how many infections and deaths in the United States are caused by gram-negative bacteria. The Centers for Disease Control and Prevention (CDC) estimates that roughly 1.7 million hospital-associated infections, from all types of bacteria combined, cause or contribute to 99,000 deaths each year. But in Europe, where hospital surveys have been conducted, gram-negative infections are estimated to account for two-thirds of the 25,000 deaths each year caused by some of the most troublesome hospital-acquired infections, according to a report released in September by health authorities there. To be sure, methicillin resistant- \textit{Staphylococcus aureus} (MRSA) remains the single most common source of hospital infections. And it is especially feared because it can also infect people outside the hospital. There have been serious, even deadly, infections of otherwise healthy athletes and school children. By comparison, the drug-resistant gram-negative germs for the most part threaten only hospitalized patients whose immune systems are weak. The germs can survive for a long time on surfaces in the hospital and enter the body through wounds, catheters and ventilators (3).

In Iran, infections caused by antibiotic-resistant bacteria continue to challenge our physicians in recent years. Most of gram-negative microorganisms, such as \textit{Acinetobacter baumannii}, became pan resistant to all available antibiotics since the invasion of US army to Iraq. Infectious diseases specialists dealing with resistant strain of gram-negative, are often forced to rely on two similar antibiotics developed in 1940s, colistin and polymyxin B. These drug were largely abandoned decades ago because of renal failure and nerve damage, nevertheless, since they have not been used much, bacteria have not had much chance to evolve resistance to them yet (4).

In conclusion, we think for gram-positive we need better drugs, but for gram-negative we need any drug.

\textbf{REFERENCES}


