Rational approach to limiting emergence of antimicrobial drug resistance

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Abstract:

Microbial resistance to the available antimicrobial agents continues to be a major problem with regard to nosocomial and community acquired pathogens. The development of resistance to commonly used antimicrobials is of particular concern when it occurs in pathogenic organisms that cause invasive disease. This has implications on morbidity and mortality of infectious diseases, and will also result in escalated costs of care due to the use of alternative antimicrobials which are often more costly. The increasing frequency of drug resistance has been attributed to combinations of microbial characteristics, selective pressure of antimicrobial use and societal factors that enhance the transmission of drug resistant organisms. The emergence of antibiotic resistant bacteria has generally correlated with the rise and fall of specific antibiotic use in clinical practice. Although the discovery of a new drug temporarily confers therapeutic superiority over bacterial pathogens, the subsequent rapid evolution of resistance limits the duration of the effectiveness of specific agents against pathogens. Surveillance and the development of drug policies that encourage judicious use of antimicrobials will help to minimise the spread of resistant infections. This paper reviews how this dual strategy may be used to control antimicrobial resistance.