



## USE AND DISUSE OF ANTIBIOTICS-IMPACT ON ANTIBIOTIC RESISTANCE IN A TERTIARY CARE HOSPITAL



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### Abstract

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Antibiotic resistance, a global concern, is particularly pressing in developing nations, including India, where the burden of infectious disease is high and healthcare spending is low. The Global Antibiotic Resistance Partnership (GARP) was established to develop actionable policy recommendations specifically relevant to low- and middle-income countries where suboptimal access to antibiotics not a major concern in high-income countries - is possibly as severe a problem assist the spread of resistant organisms. We currently face multi resistant infectious disease organisms that are difficult and, sometimes, impossible to treat successfully. In order to curb the resistance problem, we must encourage the return of the susceptible commensal flora. They are our best allies in reversing antibiotic resistance.

Antibiotic resistance, a global concern, is particularly pressing in developing nations, including India. The antibiotic resistance to microbes leads to severe consequences. Infections caused by resistant microbes fail to respond to treatment resulting in prolonged illness and greater risk of death, longer periods of hospitalization and infections which increases the number of infected people moving in the community. The driving force of antibiotic resistance is the wide spread use of antibacterial drugs. Antibiotics are given to human for treatment and prophylaxis of infectious diseases, 80% to 90% of antibiotics are used in outpatients and the remainder in hospitals. Antibiotics are appearing to be used not only in excess but also inappropriately and these accounts for 20% to 50% of all antibiotics used.<sup>(1)</sup>The Centre for Disease Control and Prevention in USA has estimated that some 50 million of 150 million prescriptions every year are unnecessary.<sup>(2)</sup> Nowadays, about 70% of the bacteria that cause infections in hospitals are resistant to at least one of the antibiotic agents most commonly used for treatment. Incorrect use of antibiotics such as too short a time, at too low a dose, at inadequate

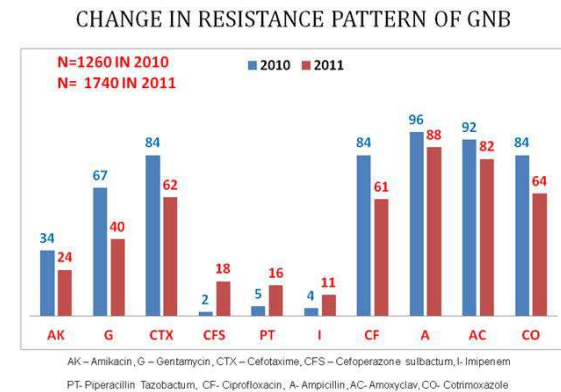
potency or for the wrong diagnosis always enhances the likelihood of bacterial resistance to these drugs. Patient related factors are major drivers of inappropriate use of antimicrobials. Many patients believe that new and expensive medications are more efficacious than older agents. This perception increases the unnecessary health care expenditure and encourages the selection of resistance to these newer agents as well as to older agents in their class.<sup>(3)</sup>

A retrospective study was conducted from January 2010 to December 2011 at a tertiary care hospital in south India. A total of 3000 Gram Negative Bacilli (GNB) isolated from nosocomial infections was included in this study. Of them 1260 were in the year 2010 and 1740 isolates in 2011. Following isolation of organisms, conventional identification was carried out by subjecting to biochemical tests and antimicrobial susceptibility test by standard Kirby- Bauer disc diffusion method.<sup>[4]</sup>Antibiotic resistance pattern of the isolates to common antibiotics was recorded and compared the results of the year 2010 with that of 2011. There was a considerable change in resistance patterns to antibiotics.

An upward trend in the resistance to imipenem (4% vs 11%), piperacillintazobactam (5% vs 16%) and cefoperazonesulbactam (2% vs 18%) was observed in 2010 and 2011 respectively. At the same time decrease in resistance was also noted for amikacin (34% vs 24%), gentamycin (67% vs 40%), cefotaxime (84% vs 62%), ciprofloxacin (84% vs 61%), ampicillin (96% vs 88%), amoxycylav (92% vs 82%) and cotrimoxazole (84% Vs 64%). (Figure 1) The emergence of resistance in nosocomial pathogens has been shown to be associated with antibiotic misuse (over use and inappropriate use) in therapy and prophylaxis. A World Health Organization (WHO) study in which *E. coli* was used as an indicator organism at four sites found high levels of resistance, especially in pathogenic isolates.<sup>(5)</sup>This study measured both antibiotic resistance and antibiotic use over the course of at least one year at all sites and resistance rates were highest to those antibiotics in use the longest.

In conclusion antibiotic resistance now has been identified as public health priority and necessary plan of action to combat resistance should be developed. Improving the quality, not just the quantity of

medication will require public and professional education towards rational use of antibiotics.



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