

## Health Warning ..... Preparedness, Surveillance and a New Understanding may be Our Solution to Multi-drug Resistant Organisms

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### Editorial

For tens of thousands of years humans and bacteria have lived in harmony with each other. Nonpathogenic bacterial flora have been part of the normal inhabitants of the human body and unless a disease state ensues or infected by a pathogenic strain of an organism, only then would bacteria pose a true treat.

In reality, humans do need bacteria to carry out normal physiological functions in addition serve as a protective barrier against colonization with more pathogenic and virulent strains of organisms. The human host forms a niche and provides nutrition for colonizing microbes. The microbe in turn occupies a space that a potential parasite or pathogen may otherwise invade. This relationship that has been in existence since the begging of man has been essentially mutualistic until now....

### The Emerging Problem

A few factors have altered this "mutualistic relationship" into a full blown war. A war that may result in man not being able to exist in the world as we know. Yes, it does sound like impending doom and gloom but the question remains - "who is the demon and whose the angel? - Microbe or Man?" Who has started this war? And what is our remaining salvation? Above all is there hope for man against the "superbugs" as we know.

The issue of the emergence of Multi-drug resistance organisms has been very topical and a problem of great concern. Multi- drug resistance organisms pose a great threat to patient survival especially those patients admitted to ICUs. We have had a surge of "SUPERBUGS" of late. For survival and natural selection microbes have been producing antibiotics for millennia whereas we only entered this domain in the 1930's and in order to survive we have developed more antimicrobials. Based on their natural selection potential it is therefore not surprising that microbes have developed resistance. Our microbe predators are ever changing continuously adapting and evolving. Even more rapid change would come at a cost of human devastation. Once organisms are exposed to an antimicrobial it's only a matter of time before a resistant clone emerges which then emerges as a "Superbug" which is allowed to spread globally. One begs the question - Are we better off today than we were a century ago? In most walks of life we are except against microbes. We are actually far worse off as we have been neglectful of the microbes and that is a recurring theme that is coming back to haunt us.

The global impact of antibiotic resistance is potentially more devastating than any war imaginable. Threatening to setback progress of human life as we know. The global impact of antibiotic resistance is

potentially devastating and if unchecked we heading towards a pre-antibiotic era.

We are on our way to the pre-antibiotic era where the use of any form of antimicrobial therapy would be a thing of the past. Behavioral factors including inappropriate use of antibiotics and ineffective infection control has led us down this path of destruction. The additional problem of agricultural antibiotic use and lack of new drug development has further added to the armory of the microbes.

A number of interventions to control bacterial resistance have been advocated. De-escalation may not necessarily be the answer as it revolves around the finding that choosing the wrong antimicrobial, is associated with an increased mortality rate. Offering broad spectrum cover may be effective but does not address the basic problem, namely why was the initial choice incorrect? The answers are rather simple; no knowledge of the resident flora and susceptibilities, the misguided use of third generation cephalosporins to treat ICU acquired infections, and an unsustainable philosophy of "better safe than sorry" [1]. Education and knowledge are more effective solutions. With an active surveillance programme and an evidenced based empiric antimicrobial policy, de-escalation is rarely indicated. Unfortunately class restriction of specific agents and antibiotic cycling have had little effect and with time have demonstrated an increase in resistance to alternative drugs.

### The Solution

The two most effective strategies are strict infection control measures and optimizing both prophylactic and therapeutic antimicrobial use by surveillance. Kollef echoes these sentiments and makes the additional salient statement that the empiric choice of antimicrobials should cover the most likely pathogens endemic to the specific location [2]. It is important to note that the statement does not read all pathogens and prescriptions cannot be based on uncommon organisms unless the situation dictates the need for de-escalation. Hence a multifactorial approach including behavioral strategies, regulation of antimicrobial use, education and pathogen surveillance are the last remaining line of defense to possible annihilation by microbes whom we share our planet with. There's the saying "keep your friends close and your enemies even closer". With microbes it's like this "Know your microbes and get to know them better as time goes along" ..... Surveillance!

The wise antibiotic use is very important and the media need to promote with doctors and with specialist journalists [3].

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