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Antimicrobial Stewardship and Surveillance: Great Expectations

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Nosocomial infections are a major cause of morbidity in the critically injured. The frequent use of antimicrobials in the critically ill has compounded problem of multidrug resistance organisms. Although nosocomial infections have become an important public health issue in all areas of hospital care, those arising in the Intensive Care Unit (ICU) have become especially problematic with a dramatic increase in resistant organisms.

The emergence of multi-drug resistant organisms necessitates new drugs and interventions to combat this serious threat. "A nil antibiotic era" is approaching as the pipeline for new antimicrobials has run dry. Management of sepsis requires accurate empiric cover without antimicrobial overuse- a goal that may be achieved by microbiological surveillance and antimicrobial stewardship.

A number of interventions to control bacterial resistance have been advocated. Unfortunately class restriction of specific agents and antibiotic cycling has had little effect and with time has demonstrated an increase in resistance to alternative drugs. The two most effective strategies are strict infection control measures and optimizing both prophylactic and therapeutic antimicrobial use by surveillance, establishing a protocol, education and stewardship. An effective empiric protocol is vital based on knowledge of local microbiologic patterns and defining risk factors which indicate when de-escalation may be warranted.

Many ICUs employ a de- escalation strategy whereby ultra broad-spectrum therapy is used and the spectrum then narrowed once microbiological cultures become available. A study conducted in a Trauma ICU highlights that surveillance, knowledge of local flora and antimicrobial susceptibility patterns make it possible to use narrow-spectrum antimicrobials [1]. Use of broad-spectrum antimicrobials was minimal thus curbing the emergence of multidrug-resistant pathogens.

Antimicrobial stewardship is a key component of the multifaceted approach to preventing antimicrobial resistance. Stewardship involves selecting an appropriate drug; optimizing the dose and duration to eradicate infection, while minimizing toxicity and conditions that select for resistant bacterial strains. A surveillance program and empiric antimicrobial policy minimizes ultra-broad spectrum prescriptions. Empiric antimicrobial therapy should cover the most likely pathogens endemic to a specific location. It is important to note that this does not refer to all pathogens, and prescriptions cannot be based on uncommon organisms unless the situation dictates the need.

There are challenges to successful stewardship, but its aims are education, prevention of antimicrobial overuse, and minimizing the development of resistance. Pivotal to success are clinicians, microbiologists, knowledge of local resistance patterns, and an antimicrobial policy that optimizes the choice, dose and duration of therapy.

References

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