Guidelines for Antibiotic Usage in Common Situations

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Healthcare setup particularly critical care units are a hotbed for microbial proliferation due to a variety of reasons. Poor infection control practices, overusage/irrational usage of antibiotics, absence of antibiotic policy/guidelines/stewardship programme are the most common causes for the development of multi-drug resistant infections.

To address the problem of inappropriate usage of antibiotics, the clinician must recognize the problems that occur, viz development of rising incidence of serious health-care associated infections due to Methicillin-Resistant Staphylococcus Aureus (MRSA), Vancomycin-Resistant Enterococcus (VRE), Extended ß-Lactamase species (ESbL) producing enterobacteriaeae, Carbapenemase producing Pseudomonas, Acinetobacter spp, Klebsiella spp. and virulent strains of Clostridium difficile.

The increasing rate of resistance among community and hospital acquired infections are no longer being matched by development of newer antibiotics should be an eye opener to the healthcare professionals. There is need for a rigid implementation of antibiotic guidelines, the appropriate term would be “Antimicrobial Stewardship”.

Recent newspaper reports of “Superbug” prevalent in India is the outcome of our country's failure to implement the widely accepted practice of antibiotic stewardship programme. Implementation of this programme involves a close interaction and co-operation between several individuals. Recommendations by Infectious Disease Society of America/Society developing an institutional programme to enhance antimicrobial stewardship programme involves a close working between several key members.

a. Core committee;
   - Infectious disease physician,
   - Clinical pharmacist with infectious disease training,
   - Health care epidemiologist,
   - Clinical microbiologist,

b. Close collaboration with the hospital infection prevention and control programme and the pharmacy and therapeutics committee.

c. Support and collaboration of;
   - Hospital administration,
   - Quality assurance and patient safety programs,

The common issues that plague an institution be it in the critical care unit or wards are nosocomial infections. These include;

a. Blood Stream Infections,
b. Urinary Tract Infections,
c. Pneumonias including Ventilator Acquired Pneumonia;
d. Skin and Soft Tissue Infections;
e. Infections at surgical site/surgical drains.

Needless to say that the primary concern in establishing or recommending guidelines for antibiotic usage is prevention by strict implementation of infection control practices. When antibiotic usage is mandatory following guidelines are recommended;

a. Risk stratification of the patient is done;
   - Patient type 1 (Community-acquired infection).
     # No contact with health care system
     # No prior antibiotic treatment
     # Patient young with no or few co-morbid conditions.
   - Patient type 2 (Health-care infection)
     # Contact with health care system
     # Recent antibiotic therapy
     # Elderly patient with multiple co-morbid condition
   - Patient type 3 (Nosocomial infection)
     # Long hospitalization and or invasive procedures
     # Recent and multiple therapies
     # Multiple co-morbid conditions including immunocompromised states.

b. Establish the common microbial flora and antibiotic susceptibility prevalent in the area of the hospital regarding the site of infection.

c. The prevalent data may be indicative of the trends prevalent for the last approximately 6 months collected by the clinical microbiologist updated at regular fixed intervals or modified on priority basis should an outbreak is likely to occur.

d. Depending on the clinical condition of the patient, site/source of infection and laboratory parameters empirical antibiotic is selected, awaiting culture and antibiotic sensitivity report is available.

e. Once antibiotic sensitivity report is available, empirical antibiotics if sensitive, then they are continued, otherwise specific antimicrobial therapy is commenced as per culture sensitivity report.

f. De-escalation or stopping of the antibiotics are done once clinical and laboratory parameters show recovery

g. Escalation of therapy is considered if MRSA, ESbL, VRE or Carbapenemase producing organism or add antifungals if fungal isolates are obtained.

Recommended antibiotics for most common pathogen isolates from cultures are,

1. MRSA: Vancomycin, Teicoplanin, Linezolid and Daptomycin.
2. ESbL: Carbapenems, Piperacillin-Tazobactum, Cefaperozone-Sulbactum, Amoxylillin-Clavulinate.
3. Enterococcus: Linezolid, Teicoplanin, Vancomycin.

4. Acinetobacter: Colistin, in combinations with Rifampin and Imipenem, Rifampin and Ampicillin-Sulbactam or Colistin and Rifampin only.

5. VRE: Linezolid, Daptomycin, high dose Ampicillin with Aminoglycoside,

Guidelines for usage of antibiotics is therefore mandatory to offset the development of antibiotic resistance. It is precisely for this reason that there is a need for creation of antibiotic guidelines, through antibiotic stewardship programme. As discussed above the antibiotic stewardship programme involves optimizing antibiotic selection, dosing, route of administration and duration of therapy.

References


2. CMI Clinical Microbiology and infection vol 16No 2 Feb 2010, Y. Carmelli, M. Akova, G. Cornaglia et all: Controlling the spread of carbapenemase-producing Gm-Neg therapeutic approach and infection control. Pg 102-106.

3. Antibiotic Protocol; Guidelines for empirical antibiotic therapy; Bhatia Hospital; Dec 2009.