10.5005/pid-2-1-v

Chairman's Page

The three basic indications of antibiotic use are for treating infections, empirical use and for prophylaxis. In ideal circumstances, antimicrobials should be used only in case of proven infections. Thus proper diagnosis is the first step toward rational antimicrobial use, and under ideal circumstances it should be proven by isolation in culture. Empirical use is subjective as it is largely by personal experience and intuition. Though this is not the ideal way to use an antibiotic but it is the most common mode of antibiotic use. Prophylactic use is based on standard protocols and indicated only in certain selective situations. Unnecessary use of antibiotics results in destruction of susceptible bacteria and selective proliferation of resistant strain leading to bacterial drug resistance.

Definitive Therapy

Antibiotics used in cases of proven bacterial infection. The aim should be to confirm and do susceptibility test. The narrowest effective antibiotic should be used based on the report.

Empirical Therapy

The choice of antibiotic depends upon the most likely pathogen in that particular anatomical site and the likely sensitivity pattern. Empirical therapy is also given in life-threatening infections where appropriate sample should be collected prior to initiating treatment. Initially broad spectrum antibiotic or combinations are used followed by narrower spectrum when sensitivity results are available.

In less severe community-acquired infections, antibiotics are sometimes prescribed without obtaining cultures. Failure of response or recurrence in such situation is an indication for subsequent culture studies.

Prophylactic Therapy

It is indicated only in certain selective situations where standard protocols have to be followed. The antibiotic used should be narrow spectrum, directed against specific pathogen and used for a short duration. It is indicated in certain diseases like rheumatic fever, infective endocarditis, urinary tract infection and recurrent otitis media. In neonates prophylactic antibiotics are used to prevent ophthalmic neonatorum and group B streptococcal infection. Postexposure prophylaxis is used in tuberculosis, malaria, pertussis, meningococcal infection, diphtheria, varicella and influenza. Other indications are asplenia, human and animal bites and surgical prophylaxis.

Combination Antibiotics

A single antibiotic with narrow spectrum helps in maintaining the normal bacterial flora, reduces cost and prevents adverse effects but there are certain situations which merits use of combination antibiotics.

Prevention of Resistant Strains

Sometimes mutations occur in genes encoding for resistance in certain bacteria. Treatment with a single antibiotic in certain infections kills the sensitive strain and help to select the resistant strain. Examples are rifampicin for staphylococci and imipenem for *Pseudomonas*. Addition of a second antibiotic with a different mode of action like aminoglycoside to imipenem in systemic pseudomonas infection might be helpful.

Synergistic or Additive Activity

Combination of a third generation cephalosporin with an aminoglycoside is an example of synergistic or additive activity for enterococci, *Streptococcus viridans* and *P. aeruginosa*.

Polymicrobial Infections

Chances of a mixed infection with multiple pathogens are high in certain situations like intra-abdominal infections, brain abscesses and fever in neutropenic patients. Combination antibiotics are indicated in these situations.

Reduction of Adverse Effects

Antibiotics with low safety may be combined in lower doses provided they are synergistic to reduce adverse effects of the individual antibiotic. Combination of streptomycin with penicillin in subacute bacterial endocarditis caused by *S. faecalis* is one such indication.

Children are more vulnerable to infections. It is quite obvious that antimicrobials are one of the most frequently prescribed components of any pediatric prescription. Antibiotics must be used judiciously as we have limited stock of antimicrobials in our armamentarium. It is imperative that antimicrobial resistance is a direct consequence of antimicrobial use. In spite of advocacy both continue to escalate. The situation is often complex in practical field as it is not easy to confirm the presence of an infection. But if few principles are followed, it can be used rationally. This will prevent antimicrobial misuse and in the long run there will be less resistance. Antimicrobial resistance is a cause of great concern because detection of even a single instance of antimicrobial resistance is a microcosm of a larger perspective. Microbes are ubiquitous in nature. It is quite obvious that we share a single global ecosystem in terms of antimicrobial resistance too.

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