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Commentary

Significance of Antimicrobials in Pharmacodynamics

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DESCRIPTION

Pharmacokinetics contracts with the drive of a drug from its administration site to the place of its pharmacologic activity and its elimination from the body. Factors affecting the movement (kinetics) and fate of a drug in the body are:

- Release from the dosage form
- Distribution to various parts of the body, including the site of action
- Absorption from the site of administration into the bloodstream
- Rate of elimination from the body *via* metabolism or excretion of unaffected drug

Though we cannot yet measure the drug concentration straight at the site of attachment to the bacterium, we can measure the drug levels in serum and can other tissues as a function of time, thus by these surrogate levels to control the concentrations of the antibiotic that are essential to inhibit (MIC) or to be bactericidal MBC) to microorganisms. Drug concentration in the blood has been connected to *in vivo* bacterial eradication. Most bacteria exist in on the outside membranes of the cell, thus unprotected to interstitial fluids. Drug concentrations in interstitial fluid drive the antibiotic into the bacterium and ultimately to the antibiotics compulsory site within the organism. Interstitial fluid drug attentions are proportional to and in fast equilibrium with blood and, consequently, the concentration of the antibiotic relates with bacterial eradication.

By merely likening the MIC or MBC's of an antibiotic in contradiction of a target organism, clinicians can attraction the erroneous conclusion that the agent with the lowest MIC or MBC in contradiction of a bacterium becomes the favored choice. The MIC of an antibiotic against a pathogen is, however, only one of many factors that control the best drug to cure an infection. When decisive the potency of an antibiotic against a bacterium, additional items such as protein binding, pharmacokinetics, and delivery into the site of infection, the adequacy of the patient's host defenses and the amount of contact of an organism to an antibiotic desirable for its eradication are also significant considerations.

Pharmacodynamics relates the concentration of the drug with its pharmacological or clinical belongings. For an antibiotic, this correlation refers to the capability of the drug to kill or inhibit the growth of microorganisms. Antibiotics provoke their activity in contradiction of bacterial by binding to a specific protein or structure in the organism.

For an antibiotic to eradicate an organism, three major factors must happen. First, the antibiotic must bind to its target site(s) in the bacterium. To reach the compulsory site is no easy matter. It must enter the outer membrane of the organism penetration resistance, avoid being pumped out of the membrane and remain intact as a molecule. Once the target is reached, the antibiotic can still be unusable if the binding site has changed its molecular configuration and no longer permits the drug to attach. A range of different binding sites has been recognized including ribosomes, penicillin-binding proteins, DNA topoisomerase/gyrase, and the cell membrane itself. The crucial binding site will differ with the antibiotic class. These binding sites can be clear as points of biochemical reaction crucial to the survival of the bacterium. Thus, by binding to these sites, the antibiotic inhibits with the chemical reaction resulting in the death of the bacterium.

CONCLUSION

For certain classes of antibiotics, the major killing effect in contradiction of an organism is shaped by either the time or the concentration of the drug at the binding site. In fact, of these two factors of bacterial killing, the killing course may be so minimal that it can be ignored in the prediction of a clinical response. There classes of antibiotics, such as aminoglycosides and quinolones, have high absorptions at the binding site which eliminates the microorganism and, hence, these drugs are considered to have a dissimilar kind of bacterial killing, named concentration-dependent killing.

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