



Antimicrobial Susceptibility Test : a Reappraisal

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Methods for antimicrobial susceptibility test appear to be of value in assisting the clinician in the appropriate selection of antibiotics. The value of the *in vitro* antimicrobial susceptibility test is dependent on how well it can predict efficacy of the drug *in vivo*. The outcome of an infection is dependent on host defense mechanisms. The immunologic status of the patients should be considered when selecting antimicrobials and when interpreting the effect of their use. One should minimize variables between *in vivo* and *in vitro* situations because the *in vivo* environment cannot be accurately simulated. So, many countries have their own national committee for antimicrobial susceptibility test in order to standardize the procedure and the interpretation criteria. Because routine susceptibility tests measure microbial inhibition, not bactericidal activity, and clinicians use drugs that compromise host defenses, the measurement of bactericidal activity may become vital for each individual. To date, no standards exist for bactericidal procedure and there are not standard interpretations for the results obtained. Another issue is the testing of multidrug interaction. More than one antibiotic is used for most of seriously infected patients, but the standard susceptibility tests are for only single drug.

Minimum inhibitory concentration (MIC) determination is most widely used to assess *in vitro* activity for clinical categorization of clinical isolates. To convert MIC values into susceptible or resistant categories, reference is made to the critical values recommended by national committees. The values are established on the basis of bacteriologic, pharmacokinetic and clinical criteria. The differences between the critical values recommended by the various committees arise from the contrasting definitions of susceptibility and resistance. Differences in antibiotic breakpoints have resulted from differences in clinical practice and interpretation of the parameters that are considered when breakpoints are set. Changes to breakpoints should be introduced only after the most careful consideration and the education of clinical microbiologists and clinicians. The accurate methods for the detection of extended-spectrum beta-lactamase (ESBL) should be developed in the near future because the frequency of ESBL-producing *Enterobacteriaceae* is rapidly increasing. In case of *Streptococcus pneumoniae*, the susceptibility criteria for the strains isolated from cerebrospinal fluid should be reevaluated. And the standard procedures and the interpretation criteria should be established for the unusual bacteria, such as *Chryseobacterium* spp., *Flavobacterium* spp., *Burkholderia* spp., etc. The clinical spectrum of activity of an antibiotic takes the following items into account: natural spectrum of activity, modal MICs of susceptible strains, pharmacokinetic data and clinical results. The critical values and clinical antibacterial spectrum of antibiotics should be evaluated and defined regularly by the national committee. And these results of evaluation and definition would be discussed internationally to meet the consensus criteria for the interpretation of antibiotic susceptibility tests.