EDITORIAL

In this issue of the journal, there are two articles on bacterial sensitivity to antibiotics. An internet literature survey using Google as the search engine confirmed well documented antibiotic resistance among common bacteria. For example, resistance to penicillins occurs in approximately 80 % of all strains of *Staphylococcus aureus*. Surprisingly, *Streptococcus pyogenes* (Group A *Streptococcus*) are very susceptible to penicillins. Multi-drug resistance is also common. The first documented case of bacterial multi drug resistance involved a strain of the dysentery bacillus isolated in Japan in 1953. It was found to be resistant to tetracycline, chloramphenicol, streptomycin and a sulphonamide. Today many other bacteria often referred to as 'superbugs' are known to be resistant to multiple drugs. There are several risk factors that contribute to the development of multiple drug resistance. Top on the list is the indiscriminate use of antibiotics by both health professionals and non-professionals.

Published literature on bacterial resistance patterns can no longer be relied upon in choosing an antibiotic for a particular patient. However such literature provides a useful guide in the absence of bacterial sensitivity tests. It is important to emphasize this point since often laboratory facilities for bacterial sensitivity testing are not available in many health institutions in African countries. Furthermore, these tests usually take a long time and yet in the case of severe infections treatment must commence immediately.

Often it is important to isolate the bacteria form the specimen before carrying out sensitivity testing. In situations where several bacteria are involved, this can be time consuming. There are also non-cultivable or slow growing organisms (e.g. *Bactronella* s*pp*) where cultures are often discarded before sufficient growth has occurred for detection. In other cases there may be a need for special isolation techniques or special media for example charcoal yeast extract agar for the isolation of *Legionella* species. Another compounding factor is the cost of such tests taking into account the purchasing power of those who need the service.

The American National Committee for Clinical Laboratory Standards has defined three general levels of bacterial sensitivity to antibiotics. These are 'susceptible', 'intermediate' and 'resistant'. Bacterial sensitivity tests take the form of microbroth dilution, agar dilution, E-tests and disc agar diffusion (Kirby-Bauer) methods. It is not possible to discuss in detail how these tests are carried out but such details are readily available in the literature. The question which is often asked is whether laboratory sensitivity tests can be relied upon to predict possible clinical outcome. Some published literature show that such tests failed to predict the actual clinical outcome of treatment when penicillin was used to treat *S. pneumoniae* infection and also when macrolides were used in various bacterial infections.

There are possible explanations which might account for the poor correlation between laboratory based *in vitro* sensitivity tests and the actual clinical outcome. For example, pharmacokinetic properties of antibiotics, such as ability to penetrate tissues where infections occur, may influence clinical outcome. Often it is possible to get good clinical results by using antibiotics of 'intermediate' sensitivity by increasing the dose or the frequency of administration or by prolonging the duration of treatment from 7 to 10 days. It is common knowledge that despite numerous studies showing widespread resistance to β-lactam antibiotics, clinicians continue to prescribe them with satisfactory clinical outcome since they are cheap and readily available. One clear message to clinicians is that bacterial sensitivity tests should only be requested when it is absolutely necessary. A good knowledge of the causative organism and what is generally known about its sensitivity to various antibiotics should enable the clinician to make a good decision. For example, in the article appearing in this issue of the journal by Rimoy *et al.*, the results obtained could reasonably be expected. The bacteria causing urinary tract infections (UTI) are the Gram negatives (*Escherichia coli, Klebsiella* spp, *Proteus* spp, *Pseudomonas* spp). These bacteria are known to be sensitive to fluoroquinolones (norfloxacin, ciprofloxacin, levofloxacin, among others),

aminoglycosides (gentamicin) and a few third generation cephalosporins (ceftazidine). They are not sensitive to co-amoxiclav, ampicillin, tetracycline and co-trimoxazole and there is no justification for sensitivity tests involving this latter group of antimicrobial agents. There is a need for the clinician to give guidance as to what sensitivity tests should be performed instead of a 'blanket' request.

Editor-in-Chief