


**Testing, reporting and prescribing antibiotics for urinary infections**

Urine samples, whether collected as midstream, catheter or other specimens, form the largest single group of specimens in most hospital microbiology laboratories. The efficient processing of two hundred or more specimens daily requires a standardized policy for both culture and antibiotic sensitivity testing, although there is room for considerable flexibility in reporting.

Urinary antibiotic sensitivities are commonly performed as a primary sensitivity test (Waterworth & del Piano, 1976) carried out on the day the specimen is received. This has several advantages: a more rapid result is provided for patient and clinician, the laboratory can expect to make a final report on the great majority of specimens within 24 h of receipt, it is possible to detect resistant subpopulations in mixed cultures and the antibiotic discs can be used for presumptive identification of bacteria such as *Serratia* and *Providencia* species.

Another approach is to test individual pathogens with appropriate antibiotic disks on the second day or, alternatively, to use the break point technique (Waterworth, 1981) with which up to 20 pathogens can be tested simultaneously on solid media containing any desired concentration of any antibiotic. Other automated techniques such as the Autobac and Abbot MS2 have been tested but seem unlikely to be used for the routine testing of urinary isolates in Britain.

Laboratories carrying out primary testing by the modified Stokes' technique need to test the agents most commonly used for therapy of urinary tract infections (UTIs) such as ampicillin, sulphonamide, trimethoprim and nitrofurantoin and also anaminoglycoside, usually gentamicin, for the detection and possible therapy of multi-resistant isolates.
Aymes & Telfer-Brunton (1981) emphasized the importance of testing the two components of cotrimoxazole separately. There are now appreciable levels of resistance to all these primary agents except gentamicin (Grüneberg, 1981). Further sensitivity testing is determined by the need to investigate potentially resistant organisms (where a patient with a gentamicin-resistant organism may need therapy or isolation) or alternatively to provide an acceptable oral agent, such as amoxycillin, an oral cephalosporin, amoxycillin/clavulanic acid or mecillinam for an outpatient with a coliform infection resistant to the primary oral agents.

Restricted reporting of antibiotic sensitivities is by convention an attempt to influence clinicians' prescribing for individual patients. What is omitted from the clinicians' report form is, to the microbiologist, as important as what is reported. Ackerman et al. (1979) found, however, that many junior hospital staff in Australia misinterpreted microbiology reports. They incriminated 'ill defined reporting conventions' which may account for the apparently irrational prescribing found worldwide by several authors, including Simon & Stolley (1974) and Moss et al. (1981). Neu & Harvey (1975) found confusion and lack of knowledge about antibiotics in a survey of 4513 American physicians in 1975, and this confusion can barely have been helped by the recent proliferation of new antimicrobial agents. Restricted reporting of urinary isolates is both an attempt to prevent irrational use of antibiotics and also an opportunity for discussion between clinician and microbiologist.

There have been reports of the success of withdrawing individual antimicrobial drugs from clinical use in controlling local outbreaks of infection with multi-resistant organisms and also on the overall influence of restrictive reporting policies (McGowan & Finland, 1974; Lacey, 1979). Restricted reporting policies should be devised in the light of local patterns of resistance. They should be discussed with both clinicians and pharmacists as part of an overall antibiotic policy, as a restricted reporting policy is ineffective unless it is supported by limited prescribing from pharmacy. One possible antibiotic policy is to divide antibiotics into three groups. The first group contains agents such as ampicillin and trimethoprim, whose prescription is based solely on clinical and laboratory data. Prescription of agents in the second group such as amoxycillin/clavulanic acid or gentamicin should be notified by the pharmacy to the microbiology department to allow discussion between microbiologist and clinician on the use of less toxic agents or to reduce the use of agents to which resistance may develop. Antibiotics such as amikacin and cefotaxime in the third group should only be prescribed after discussion between clinician and microbiologist, although there should be no question of a veto on their use by microbiologists. The placing of antibiotics in each group may vary with resistance rates in different hospitals but the purpose of the policy is to prevent overusage of antibiotics which should be reserved for unusually resistant or life-threatening infections.

A limited reporting policy, supported by discussion and positive advice, was instituted at the Bristol Royal Infirmary in response to an increased isolation rate of gentamicin-resistant Klebsiella aerogenes thought to have been caused by previous indiscriminate overusage of cotrimoxazole (Curie et al., 1979). Two agents only (a sulphonamide and nitrofurantoin) were reported in uncomplicated inpatient urinary infections with bacteria sensitive in both these agents, in an attempt to reduce the overall use of cotrimoxazole and ampicillin. A survey by Barnes (1981) found that this restricted reporting had only a small effect on prescribing; clinicians often prescribed antibiotics on which sensitivities had not been reported, or continued to treat patients with antibiotics known to be inactive in vitro against the patient's pathogen.

For the future it would seem that increasing rates of resistance to antibiotics such as ampicillin and trimethoprim may compel a change in reporting and prescribing habits. The problem of correlating laboratory results with patient therapy is more complex. A survey of antibiotic prescribing habits in several departments at Southmead Hospital, Bristol, was carried out in 1979, and the results circulated to all physicians concerned together with microbiologists' comments. The survey was repeated six months later and showed improvements in some departments but deterioration in others, due possibly to changes in junior staff (D. S. Reeves, private communication).

This kind of audit may have a greater role to play in the future, coupled with a continuous education on the use of antibiotics throughout a doctor's career in order to ensure the most efficient use of laboratory
facilities and to attempt a more rational use of antibiotics.

A. J. DAVIES
Department of Microbiology.
Bristol Royal Infirmary.
Bristol BS2 8HW.
England

References


