Penicillin-"sensitive" methicillin-resistant Staphylococcus aureus

Sir,—The occurrence of penicillin-sensitive methicillin-resistant strains of *Staphylococcus aureus* has been mentioned to me three times recently, and one of the strains, isolated at Lincoln Public Health Laboratory, was available for investigation.

Penicillin resistance in *Staph aureus* is primarily by production of penicillinase, whereas methicillin resistance is intrinsic and temperature sensitive. Penicillin-negative methicillin-resistant strains are resistant to penicillin,1,2 and it seemed likely that the penicillin-"sensitive" methicillin-resistant strains were in fact penicillinase-negative and that penicillin resistance would be demonstrable under conditions used for detection of methicillin resistance.

The Lincoln strain, five penicillin-positive methicillin-resistant strains, their penicillinase-negative variants, and one other penicillinase-negative methicillin-resistant strain (all from the Cross-Infection Reference Laboratory, Colindale) were tested for penicillinase production3 and for penicillin and methicillin sensitivity by disc tests carried out under conditions favourable (on oxoid DST agar at 37°C) for the detection of methicillin resistance.4 Methicillin 10 μg and penicillin 2 unit discs were used.

The penicillinase-producing strains gave no zones of inhibition around penicillin discs under any conditions tested, whereas six of the penicillinase-negative strains gave zones with diameters of 21-28 mm around penicillin discs on DST at 37°C. These zone sizes were close to that of the sensitive Oxford control (30 mm) and undoubtedly some of the strains would have been reported penicillin sensitive. Under similar conditions methicillin resistance was not always obvious—10 of the 12 methicillin-resistant strains gave zones with diameters of 15 mm or greater around methicillin discs. On Mueller-Hinton agar at 34°C no methicillin-resistant strain gave zones with diameters greater than 13 mm around penicillin or methicillin discs, whereas the control zones were 32 mm and 24 mm respectively.

Thus, with the strains tested, methicillin resistance conferred resistance to benzylpenicillin and this resistance could often be demonstrated under conditions which allowed expression of methicillin resistance. In practice attention is likely to be drawn to these unusual strains even if methicillin sensitivity has not been tested because methicillin-resistant strains are almost invariably resistant to tetracycline and streptomycin and often resistant to other antibiotics. Sensitivity to penicillin in an otherwise multiply resistant strain should be viewed with scepticism, and such strains should be tested against methicillin. Methicillin-resistant strains should be reported penicillin-resistant even if apparently penicillin sensitive when tested at 37°C.

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