Modified antimicrobial disc susceptibility testing for nutritionally-variant streptococci.

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Abstract

Streptococci that were dependent for their growth upon staphylococci were isolated from a patient with sub-acute bacterial endocarditis and subsequently identified as nutritionally-variant streptococci (NVS). Failure of the isolate to grow on agar media supplemented with pyridoxal hydrochloride or L-cysteine, the known supporting growth factors for NVS, made conventional antimicrobial disc diffusion assay impossible. We modified the assay by co-inoculating Staphylococcus aureus resistant to the drugs being tested as a helper to support the growth of the NVS. Streaking S. aureus closely to the antibiotic discs that were placed above NVS resulted in the growth of satellite colonies of NVS that orbited the S. aureus and that produced a pattern of interrupted zones of growth inhibition. Using an alternative method--adding staphylococcal secreting factor(s) to a 10% staphylococcal cell-free culture supernatant and adding this to an antibiotic susceptibility testing medium--we found that the NVS formed colonies that formed clear zones of growth inhibition around the disc. When the sizes of the growth inhibition zones produced by both these methods were compared with those recommended by the NCCLS, the NVS were found to be susceptible to penicillin, vancomycin, erythromycin, chloramphenicol, cefoperazone, cefamandole and ofloxacin and resistant to co-trimoxazole, gentamicin and tetracycline. Based on these findings, vancomycin was selected for treatment and the patient was cured of endocarditis. The correlation between the in vitro drug susceptibility testing and the in vivo clinical response indicated that the modified antibiotic susceptibility test is an appropriate method for establishing antibiotic regimens.

The Southeast Asian journal of tropical medicine and public health. 2002; 33(1) : 151-154