THE PATHCARE NEWS

RAPID IDENTIFICATION OF BLOOD CULTURES

Pathcare Reference Laboratory has recently instituted a rapid blood culture ID technique where organisms from positive blood cultures can now be identified after about 4 hours from the time when the blood culture system flags the blood culture bottle as positive.

The technique was validated for commonly isolated Gram negative and Gram positive isolates, but not for yeasts, infrequently isolated bacteria or fastidious bacteria that are slow-growing.

The rapid ID will add value to clinical decisions as it can inform antimicrobial choice to some extent.

If the blood culture Gram stain reveals a Gram positive coccus, the rapid identification will make a distinction between streptococci and staphylococci. Streptococci can mostly be treated with a penicillin whilst staphylococci can be treated with cloxacillin (if the infection is community acquired) or daptomycin / linezolid / vancomycin / ceftaroline, if the infection is hospital acquired.

If the blood culture Gram stain reveals a Gram negative bacillus, the rapid identification will distinguish fermentative bacteria (e.g. *E. coli, Klebsiella, Enterobacter* etc) from non-fermentative bacteria (e.g. *Pseudomonas and Acinetobacter*), which will further guide empiric antimicrobial choice.

Rapid blood culture ID results will generally be communicated to the requesting clinician by phone or SMS.

Dr Marthinus Senekal

(Clinical microbiologist: Pathcare)

The private pathology groups in South Africa recently reported on blood culture results from a select group of bacteria causing healthcare-associated infections, known by the acronym, ESKAPE (*Enterococcus faecium, Enterococcus faecalis, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter baumannii, Pseudomonas aeruginosa, Enterobacter cloacae and Escherichia coli*) together with their antimicrobial susceptibility testing (AST) patterns (1). AST performed on ESKAPE organisms isolated from 9029 blood cultures during 2016 were analysed.

Of the 9029 blood cultures analysed, 58% (5247) were Enterobacteriaceae, 28% (n=2564) were Gram-positive bacteria and 14% (n=1218) were non-fermentative Gram-negative bacteria.

Of the seven ESKAPE organisms, *Escherichia coli* (30,8%), *Klebsiella pneumoniae* (27,3%), *Staphylococcus aureus* (16,7%) and *Pseudomonas* (10,1%) were the organisms most commonly isolated from blood cultures.

Of the *Escherichia coli* cultured, eighteen percent were ESBL producers. Less than one percent of isolates were non-susceptible to the carbapenems, but thirty-one percent of isolates were non-susceptible to ciprofloxacin.

Of the *Klebsiella pneumoniae* cultured fifty six percent were ESBL producers. Just less than 10% of isolates were non-susceptible to the carbapenems: imipenem, meropenem and doripenem, and fifteen percent were non-susceptible to ertapenem. Forty-one percent of isolates were non-susceptible to ciprofloxacin.

Twenty-six percent of S. *aureus* isolates were non-susceptible to cloxacillin (MRSA).

Less than 30% of *P. aeruginosa* isolates were non-susceptible to the third-generation cephalosporin, ceftazidime, and the fourth-generation cephalosporin, cefepime. Non-susceptibility to the carbapenems, meropenem and imipenem, was 36% and 38%, while non-susceptibility to doripenem was observed in 32% of the isolates. Thirty-six per cent of isolates were non-susceptible to piperacillin/tazobactam.

Reference:

1. Perovic O, Ismael H, Van Schalkwyk E et al. Antimicrobial resistance surveillance in the South African private sector report for 2016. South African Journal of Infectious Diseases 2018;33(4):114-117.