Faster results when time is crucial

Accurate minimum inhibitory concentration (MIC) measurements remain the cornerstone of any effective antimicrobial-testing regime. *Practical Patient Care* talks to Professor Gian Maria Rossolini, director of the department of microbiology and virology at the University of Careggi, Italy, and Dr Tiziana Di Martino, chief medical officer at **Q-Linea**, about how the company's ASTar system generates faster MIC values to improve patient outcomes and enhance existing antimicrobial stewardship programmes.

What are the major unmet needs for microbiological diagnosis of septic patients?

Professor Gian Maria Rossolini: Sepsis is a time-dependent syndrome – the major unmet need for microbiological diagnosis with septic patients is to significantly shorten the time required to provide information on the nature of the causative pathogen and on its antimicrobial susceptibility profile. In fact, rapid information on the antimicrobial susceptibility profile is crucial to antimicrobial stewardship by allowing a rapid revision of the empiric treatment, which can improve the clinical outcomes and, at the same time, reduce the selection of resistant pathogens caused by the unnecessary use of broad-spectrum antibiotics.

How important is it to test a large array of antibiotics, including novel molecules, in antimicrobial susceptibility testing?

GMR: In an era of globally increasing antibiotic resistance, with resistance traits variably spreading among nearly all the most important bacterial pathogens responsible for sepsis, it is increasingly difficult to predict the antimicrobial susceptibility pattern of the infecting pathogen.

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Tiziana Di Martino

What is the value of minimum inhibitory concentration (MIC) measurements in diagnostic clinical microbiology?

GMR: MIC is the reference parameter for antimicrobial susceptibility testing (AST), and clinical breakpoints for categorical interpretation of results are primarily referred to MIC values. This measurement, therefore, remains the cornerstone for AST in diagnostic clinical microbiology, being mandatory whenever clinical breakpoints are only available for MIC values. Moreover, with some bug-drug combinations, knowledge of MIC values is relevant for the selection of the most appropriate antibiotic regimen based on clinical evidence and on PK/PD considerations – see, for instance, the issue about carbapenem-based regimens for treatment of infections caused by carbapenem-resistant enterobacterales. Hence the importance of measuring precise MIC values with the utmost accuracy.

For this reason, it is important to test a large array of antibiotics with clinical isolates, including not only first-line agents but also second/third-line agents that can retain activity against multiresistant pathogens. The tested array should also always include novel antibiotics, which may represent the only reliable option against pathogens that exhibit a difficult-to-treat resistance profile. Testing novel antibiotics with a multi-tiered sequential approach may significantly delay the release of information of clinical value, which can be relevant for antimicrobial stewardship. This is true especially in areas where multiresistant pathogens are endemic and prevalent.

How do you envision the impact of the ASTar system on antimicrobial stewardship and the management of severe infections?

Dr Tiziana Di Martino: By providing MIC results in just three to six hours against a broad antibiotic panel, including novel molecules, the ASTar system enables physicians to faster escalate, de-escalate and optimise antimicrobial therapy in clinical scenarios where time is life. Notably, in critically ill patients that typically present variable and altered PK/PD, MIC values are necessary to avoid under or over-exposure to antimicrobials. Appropriate, adequate, and optimal antibiotic therapy can improve patient outcomes and antibiotic stewardship by reducing the development of further resistances and the onset of other antibiotic-related undesired effects, such as *clostridioides difficile* infections.

Importantly, the ASTar system can be easily used by less-experienced laboratory staff and combined with any identification technology, allowing smooth implementation in any laboratory workflow. The first product that will be released by Q-linea is a Gram-negative panel from positive blood cultures in order to address the challenge posed by multidrug-resistant pathogens highlighted as 'highest-priority' by WHO. Panel extensions and applications from other sample types are also in the pipeline. In conclusion, the ASTar system offers a rare combination of features that make it a promising ally to fight sepsis and antimicrobial resistance. ●

For further information

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