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Paper Poster Session
Rapid susceptibility testing and resistance detection

Reliability of the Xpert MRSA NxG assay and the BD MAX MRSA XT assay to detect genetically diverse mecA/mecC MRSA and mecA drop-out MSSA isolates from Europe

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Background: Early screening for MRSA carriage is essential to limit the dissemination of such isolates in hospitals and/or to consider decolonization of patients for reducing risk of infection during hospital stay. Different molecular kits are available to detect MRSA in nasal swabs. They are mostly based on primers targetting the mecA gene and the SCCmec-OrfX junction. Increasing reports of atypical SCCmec cassettes, novel mec gene and ever more diverse genetic backgrounds in MRSA strains as well as emergence of mecA drop-out isolates prompted us to test the accuracy of the last versions of Xpert MRSA NxG assay (XpertA) (Cepheid) and the BD MAX MRSA XT assay (BDA) (Becton Dickinson) using a selection of S. aureus isolates.

Material/methods: One hundred fourteen isolates were included : i) Group 1: 53 MRSA isolates (mecA-positive, n= 43 ; mecC-positive, n= 10), belonging to 33 different spa-types and representing the main clones circulating in Europe on the basis of literature review; ii) Group 2: 37 randomly-choosen MRSA isolates harbouring various atypical SCCmec cassette on the basis of molecular data (StaphyType microarrays (Alere) and/or Kondo's PCR); iii) Group 3: 16 randomly-choosen mecA-drop-out MSSA, defined as MSSA with residual marker(s) of SCCmec cassette on the basis of microarrays. All isolates were tested using XpertA and BDA kits according to manufacturers.

Results: Among the 53 MRSA isolates in Group 1, all isolates were correctly identified as MRSA except one for XpertA (spa-t045) and three for BDA (spa-t001, spa-t091, spa-t064). All mecC isolates were detected by both reagents.
Among the 47 MRSA isolates of Group 2, 8 isolates (spa-t008, -t030, -t127, -t190, -t1614) using BDA and 3 isolates (spa-t777, -t1664, -t2505) using XpertA were misclassified.
Finally, all the 26 mecA drop-out isolates (Group 3) were identified as MSSA whatever the assay used.

Conclusions: Based on the specific collection of isolates included in the present study, Xpert MRSA NxG assay (XpertA) showed a higher accuracy to identify the clinical MRSA isolates/clones circulating in Europe compared to BD MAX MRSA XT assay (BDA) with 4 versus 11 misclassifications, respectively. These misclassifications are mainly due to MRSA isolates/clones with new or variant SCCmec cassette. The discrepancies between XpertA and BDA are likely related to a different range of primers targetting SCCmec cassette that is likely more wide and optimised in XpertA kit.
These data confirmed the permanent need for epidemiological watch for manufacturers involved in the market of molecular screening of MRSA to be able to quickly adapt their kits to the constant emergence of new MRSA clones harbouring new SCCmec cassettes.