As ACME is a putative virulence determinant that can be classified based on the (ST) among hospital-acquired bloodstream isolates. This study characterized molecular epidemiological trends of MRSA isolates: Between 1996 and 2008, inclusive, MRSA was identified by conventional techniques in 458 positive blood cultures (BacT/ALERT 3D; bio-Mérieux, Marcy l’Étoile, France). The arginine catabolic mobile element (ACME) is a putative virulence determinant that can be classified based on the (ST) among hospital-acquired bloodstream isolates. This study characterized molecular epidemiological trends of MRSA isolates: Between 1996 and 2008, inclusive, MRSA was identified by conventional techniques in 458 positive blood cultures (BacT/ALERT 3D; bio-Mérieux, Marcy l’Étoile, France).

Background: The arginine catabolic mobile element (ACME) is widely distributed amongst certain coagulase negative staphylococcal species. However, with respect to methicillin-resistant Staphylococcus aureus (MRSA), ACME carriage is responsible, at least in part, for the current sub-pulsotype replacement event (Figure 1c), suggesting that the presence of an ACME in these strains may be contributing to their recent success. WGS was employed to further characterize molecular epidemiological trends of ST239-MRSA-III isolates from Liverpool Hospital, NSW, Australia.

Introduction

Staphylococcus aureus (MRSAs) is an important pathogen causing infections in both the community and hospital setting. In Australia, MRSAs for 24% of aureus bloodstream infections and is associated with increased health-care costs, morbidity and mortality.

The arginine catabolic mobile element (ACME) is a putative virulence determinant that can be classified based on the (ST) among hospital-acquired bloodstream isolates. This study characterized molecular epidemiological trends of MRSA isolates: Between 1996 and 2008, inclusive, MRSA was identified by conventional techniques in 458 positive blood cultures (BacT/ALERT 3D; bio-Mérieux, Marcy l’Étoile, France).

Methods

MRSA isolates: Between 1996 and 2008, inclusive, MRSA was identified by conventional techniques in 458 positive blood cultures (BacT/ALERT 3D; bio-Mérieux, Marcy l’Étoile, France). The arginine catabolic mobile element (ACME) is a putative virulence determinant that can be classified based on the (ST) among hospital-acquired bloodstream isolates. This study characterized molecular epidemiological trends of MRSA isolates: Between 1996 and 2008, inclusive, MRSA was identified by conventional techniques in 458 positive blood cultures (BacT/ALERT 3D; bio-Mérieux, Marcy l’Étoile, France).

The presence of ACME in our ST239-MRSA-III coincides with the replacement of CL4 sub-pulsotype isolates by CL3 sub-pulsotypes. The position of ACME is favorable to harboring an ACME and to demonstrate the advantageous potential of ACME II in Australia. Although previous studies detected the ACME II in our ST239 isolates.

Results

During the 12-year period, ST239 was the prevailing MRSA ST among bloodstream isolates from Liverpool Hospital (458/512 isolates, 88.6%) as determined by PFGE, with five clades (CL1-5) comprising 61 PFGE subtypes (Figure 1a). Eighty-eight (88%) of CL1 isolates were positive for ACME compared to only 60% of CL4 isolates (Figure 1a), suggesting that the presence of an ACME in these strains may be contributing to their recent success. WGS was employed to further characterize molecular epidemiological trends of ST239-MRSA-III isolates from Liverpool Hospital, NSW, Australia.

Conclusion

To our knowledge, this is the first genetic characterization of an ACME allele in ST239-MRSA-III and the first report of ACME II in Australia. Although previous studies detected the ACME II in Australian USA300-like isolates, the ACME was not further characterized. Genetic comparisons between the anti-Agrobacterium Type IV secretion system (T4SS) and the ACME II in our ST239-MRSA-III coincides with the replacement of CL4 sub-pulsotype isolates by CL3 sub-pulsotypes. The position of ACME is favorable to harboring an ACME and to demonstrate the advantageous potential of ACME II in Australia.

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