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E0011 Antimicrobial susceptibilities of USA300 methicillin-resistant Staphylococcus aureus isolates in Stockholm, Sweden

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Background: USA300 isolates were initially resistant only to methicillin, macrolides, and, increasingly, fluoroquinolones. It has been reported that several USA300 isolates have developed reduced susceptibility to vancomycin, and, in some cases, to daptomycin, in addition to occasional resistance to gentamicin and trimethoprim-sulfamethoxazole. This study aimed to investigate the antimicrobial susceptibilities of USA300 isolates in Stockholm during 2008-2016.

Materials/methods: In total, 291 consecutive non-duplicate MRSA isolates, with the pulsed-field gel electrophoresis (PFGE) pattern USA300, from 286 cases in Stockholm during January 2008 – December 2016 were investigated. USA300 accounted for 5.3% of all MRSA cases recovered during this period. In five cases with repeated isolation of USA300, the resistance pattern in a subsequent isolate was altered compared with the initial isolate.

The PFGE USA300 type was defined by comparison with the reference pattern of HARMONY strain SE03-5 (multilocus sequence type ST8, *spa* t008, SCC*mec* IV, *pvl*-positive) according to the International Union of Microbiology Societies' European Staphylococcal Typing Network.

The following 19 antimicrobial agents were tested: cefoxitin, ceftaroline, clindamycin, daptomycin, erythromycin, fusidic acid, gentamicin, levofloxacin, linezolid, moxifloxacin, mupirocin, norfloxacin, rifampicin, teicoplanin, telavancin, tetracycline, tobramycin, trimethoprim-sulfamethoxazole and vancomycin. The minimum inhibitory concentrations (MICs) of the antimicrobial agents for each isolate were determined by broth microdilution following EUCAST guidelines.

Results: Among these isolates, the highest resistance rate for non-β-lactams was found to erythromycin (86%), followed by fluoroquinolones (levofloxacin 69% and moxifloxacin 68%). The most common resistance combination was resistance to both erythromycin and fluoroquinolone, which occurred in 57% of all isolates. The most resistant patterns were simultaneously resistant to four non-β-lactam antibiotic classes, found in six isolates (2,1%). Two different patterns were found, including erythromycin-fluoroquinolone-clindamycin-tetracycline and erythromycin- fluoroquinolone -fusidic acid-aminoglycoside. Ceftaroline, daptomycin, linezolid, mupirocin, rifampicin, teicoplanin, telavancin, trimethoprim-sulfamethoxazole and vancomycin retain full activity against USA300 isolates in Stockholm. Four isolates (1.4%) were found to be susceptible to all non-β-lactam antibiotics tested.

Conclusions: Although there were few multidrug resistant isolates, the Stockholm USA300 isolates were no longer multi-susceptible to non-β-lactam agents. With its potential to become resistant to additional antibiotic classes, USA300 MRSA should be well monitored when identified in an area.