ANTIMICROBIAL SUSCEPTIBILITY OF DAPTOMYCIN AND COMPARATOR AGENTS TESTED AGAINST METHICILLIN-RESISTANT S. AUREUS (MRSA) AND VANCOMYCIN-RESISTANT ENTEROCOCCI (VRE): ANALYSIS OF A FIVE-YEAR TREND IN USA MEDICAL CENTRES (2005-2009)

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OBJECTIVE: To evaluate the occurrence of daptomycin susceptibility and resistance of S. aureus (MRSA) and VRE in USA medical centers over the last five years.

METHODS: Consecutive, unique patient strains of clinical significance were collected in 31 USA medical centers and susceptibility testing was performed by the Clinical and Laboratory Standards Institute (CLSI) broth microdilution methods. MIC testing was performed in 2005, 2006, 2007, 2008, and 2009. VRE were identified using the Clinical and Laboratory Standards Institute (CLSI) antimicrobial resistance standard. Calcium content of MIC plates used during the year was evaluated. Daptomycin resistance was defined as a daptomycin MIC of ≥2 μg/ml. The collection of organisms included S. aureus, VRE, and S. epidermidis.

RESULTS: A substantial decrease to 2.9% was observed in 2009 (significant; p<0.05). Vancomycin (MIC<8 μg/ml; VRE) was significantly increased in 2009 compared to 2006 (p<0.05). Resistance to daptomycin remained somewhat stable during the study period. The overall occurrence of daptomycin non-susceptible isolates was (0.1%) were observed among VRE. Only two VRE isolates were resistant to daptomycin (0.0%). In addition, 2.7% of MRSA isolates were non-susceptible to daptomycin in 2009.

RESULTS: The occurrence of daptomycin MIC 0.5 ≤ ≤ 2 was decreased from 0.8% in 2006 to 0.25% in 2009 (p<0.05). The occurrence of daptomycin MIC 2 ≤ ≤ 4 was increased from 0.68% in 2006 to 2.6% in 2009 (p<0.05). The occurrence of daptomycin MIC >4 was increased from 0.1% in 2006 to 2.6% in 2009 (p<0.05).

CONCLUSIONS: Daptomycin activity was not affected by resistance to vancomycin. The occurrence of daptomycin resistance among S. aureus was stable over the last five years.

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ABSTRACT (REVISED)

Background: Daptomycin (DAP) has been approved by the USA-FDA for treating uncomplicated and deep wound infections in Staphylococcus aureus (MRSA) and Vancomycin-resistant Enterococci (VRE) infections. The incidence of daptomycin resistance has been studied extensively, and daptomycin has been shown to be an effective agent against MRSA, VRE, and S. epidermidis in key clinical trials. The objective of this study was to evaluate the occurrence of daptomycin susceptibility and resistance of S. aureus (MRSA) and VRE in USA medical centers over the last five years.

Methods: Consecutive, unique patient strains of clinical significance were collected in 31 USA medical centers and susceptibility testing was performed by the Clinical and Laboratory Standards Institute (CLSI) broth microdilution methods. MIC testing was performed for the collection of organisms. Calcium content of MIC plates used during the year was evaluated. Daptomycin resistance was defined as daptomycin MIC of ≥2 μg/ml. The occurrence of daptomycin resistant isolates was evaluated.

RESULTS: Daptomycin-non-susceptible isolates were observed among VRE (0.1%) and MRSA (2.7%) in 2009. Only two VRE isolates were resistant to daptomycin (0.0%). In addition, 2.7% of MRSA isolates were non-susceptible to daptomycin in 2009.

RESULTS: The occurrence of daptomycin MIC 0.5 ≤ ≤ 2 was decreased from 0.8% in 2006 to 0.25% in 2009 (p<0.05). The occurrence of daptomycin MIC 2 ≤ ≤ 4 was increased from 0.68% in 2006 to 2.6% in 2009 (p<0.05). The occurrence of daptomycin MIC >4 was increased from 0.1% in 2006 to 2.6% in 2009 (p<0.05).

CONCLUSIONS: Daptomycin activity was not affected by resistance to vancomycin. The occurrence of daptomycin resistance among S. aureus was stable over the last five years.