Clindamycin Susceptibility of Methicillin-Resistant *Staphylococcus aureus* Varies by Epidemiology and Infectious Process

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Introduction

- Methicillin-resistant *Staphylococcus aureus* (MRSA) has historically been associated with health-care associated infections[1]
- Recently MRSA has begun to emerge in the community[2] and these isolates have demonstrated a different susceptibility pattern
- Choice of empiric therapy is an important part of treatment
- An antibiogram based on epidemiology or infectious disease may highlight differences in susceptibility and provide a better guide for empiric therapy
- Current antibiograms used in institutions use aggregate data to determine susceptibility patterns[3]
  - Limitations to institutional antibiograms:
    - Not unit/location specific
    - Not disease state specific
    - Does not distinguish between community or hospital-associated isolates

Objectives

Primary Objectives
- To create a clinical manifestation specific antibiogram for MRSA isolates
- To create an antibiogram for epidemiological group

Secondary Objectives
- To determine if the susceptibility pattern seen is dependent on location in the hospital
- To determine if immunosuppression has an impact on susceptibility
- To determine if patients transferred from an outside hospital display a different susceptibility pattern

Methods

- IRB approval was obtained
- Retrospective and descriptive study
- Reviewed methicillin-resistant *Staphylococcus aureus* isolates identified from clinical microbiology laboratory
- ICD-9 codes and patient profiles were reviewed
  - Location of patient when culture was obtained
  - Specimen type
  - Antibiotic susceptibilities (ciprofloxacin, clindamycin, gentamicin, rifampin, tetracycline, linezolid, and vancomycin)
  - Clinical diagnosis by ICD-9 code
  - History of immunosuppression
  - History of prior hospitalizations and MRSA infection

Methods

Inclusion Criteria
- Jan 1st – Dec 31st 2011
- First MRSA culture obtained from each site for each patient
- Patients seen at Children's Mercy Main and South campuses

Exclusion Criteria
- Cultures obtained from surveillance nasal swabs
- Patients with cystic fibrosis

Definitions[4,5]

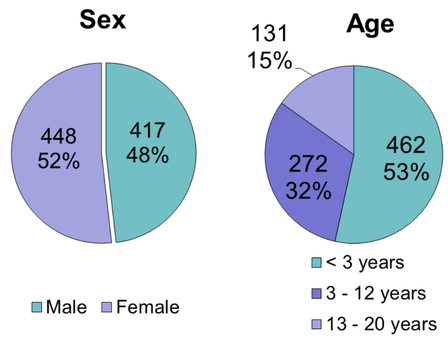
Community-associated MRSA (CA-MRSA)
- Infection that occurs within 48 hours of hospitalization
- No health-care associated risk factors
- Culture obtained at outpatient facility

Health-care associated MRSA hospital onset (HA-MRSA-HO)
- Infection that occurs 48 hours after hospitalization

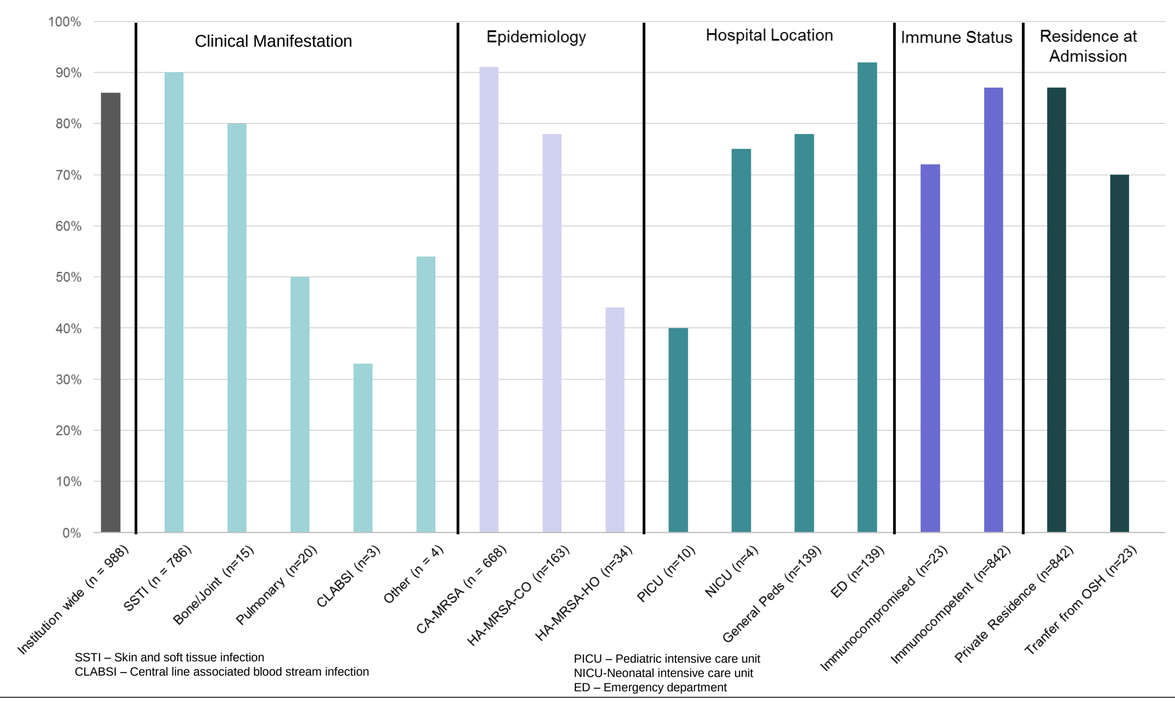
Health-care associated MRSA community onset (HA-MRSA-CO)
- Invasive device at time of admission
- History of MRSA infection or colonization
- History of surgery, hospitalization, dialysis, or residence in a long-term care facility in the 12 months prior to culture date

Results

- 1415 isolates were identified
- 865 isolates met inclusion criteria



MRSA Clindamycin Susceptibility Rates



SSTI – Skin and soft tissue infection
CLABSI – Central line associated blood stream infection

PICU – Pediatric intensive care unit
NICU-Neonatal intensive care unit
ED – Emergency department

Conclusions

- The susceptibilities for antibiotics except ciprofloxacin and clindamycin were similar throughout the categories ranging from 97% to 100% susceptible
- MRSA isolates from SSTI displayed 90% susceptibility, whereas other disease states had lower susceptibility rates
  - IDSA guidelines suggest clindamycin can be considered as empirical therapy if local resistance is low (<10%)
  - Thus clindamycin may be an appropriate empiric antibiotic for SSTI
  - Alternative antibiotics may be considered for other infection types
- CA-MRSA isolates had a 91% susceptibility compared to 78% and 44% seen in HA-MRSA isolates
  - Clindamycin would be an appropriate choice for a CA-MRSA infection
- Isolates obtained from the PICU demonstrated greater resistance to clindamycin
  - Further demonstration clindamycin may not be an appropriate empirical choice for a health-care associated infection or serious infections

Limitations

- Retrospective data
- Risk of misclassifying the isolates into the epidemiologic group
- Dependent on patient recall of MRSA infection for classification
- ICD-9 codes may not encompass all diagnoses
- Does not take into account prior antibiotic exposure
- Small population size for indications other than SSTI
- No clear consensus guidelines on how to create an antibiogram based on epidemiologic group or clinical manifestation

Literature Cited

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Disclosures

Rangaraj Selvarangan, BVSc., Ph.D. is a consultant for BioFire, which is independent of this study. The other authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct of indirect interest in the subject matter of this presentation.