Emergency Department Pharmacist Led Methicillin Resistant Staphylococcus *Aureus* Polymerase Chain Reaction Assay for Vancomycin in Pneumonia

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Background

- Antimicrobial regimen for methicillin- resistant *Staphylococcus aureus* (MRSA) coverage with antibiotics such as vancomycin are recommended for empiric use in the treatment of suspected MRSA [1-2]
- Nasal MRSA Polymerase Chain Reaction (PCR) assay has shown high negative predictive value for MRSA pneumonia
- Previous retrospective studies in the inpatient setting have demonstrated no difference in hospital mortality or decreased exposure to broad-spectrum antimicrobials (vancomycin) with MRSA PCR utilization for de-escalation of therapy[3-5]
- Early utilization of MRSA PCR by pharmacists in the ED will lead to early de-escalation or avoidance of vancomycin in patients with suspected pneumonia and MRSA risk factors

Objectives

Utilize MRSA PCR assay by pharmacist in the ED for early de-escalation or avoidance of vancomycin in patients with suspected pneumonia and MRSA risk factors

Methods

Design:
Single center, retrospective cohort study

Groups:
Control Group: Historical cohort, no pharmacist MRSA PCR intervention and received IV vancomycin
Intervention Group: Pharmacist initiated MRSA PCR assay

Inclusion Criteria:
- Patients presenting the Emergency Department between 8-1-2019 and 9-30-2020
- ≥ 18 years
- Radiographic diagnosis of pneumonia
- Patients with empiric vancomycin ordered

Exclusion Criteria:
- Currently on chemotherapy for malignancy or with neutropenic fever
- Patients with lung transplant or cystic fibrosis
- Prior positive MRSA in a blood, sputum culture, or suspected MRSA infection elsewhere
- Patients with concomitant empiric agents with MRSA activity (e.g., linezolid, ceftaroline)

Methods

Sample Size:
38 patients (patient enrollment ongoing)

Primary Endpoints:
1. Number of patients who received only one dose of vancomycin prior to MRSA PCR result

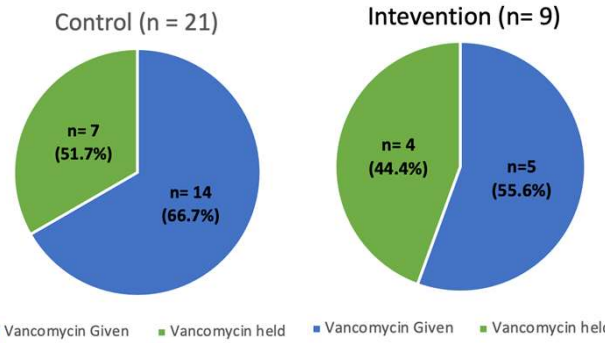
Secondary Endpoints:
2. Number of patients in whom empiric vancomycin was avoided in the Emergency Department
- Number of patients who had positive MRSA sputum or blood culture despite negative MRSA PCR results
- Hospital length of stay and hospital mortality
- Need for vancomycin level monitoring

Results

	Control (N=29)	Intervention (N=9)	P-Value
Age (yr), m (IQR)	70 (61-82)	83(65-87)	0.19
Sex (male), n (%)	15(51.7)	3(33.3)	0.33
History of tracheostomy, n (%)	4 (13.8)	1(11.1)	1.00
Hemodialysis at admission, n (%)	10 (34.5)	3(33.3)	1.00
Sepsis in the ED, n (%)	9 (31.0)	4 (44.4)	1.00
Septic Shock in the ED, n (%)	4(44.4)	2(50)	1.00
Indication for vancomycin, n (%)			
CAP	12 (8.5)	3 (60)	-
HCAP	1 (7.1)	1 (20)	-
HAP	0 (0)	1 (20)	-
VAP	1 (7.1)	0 (0)	0.27
MRSA PCR ordered in the ER, n (%)	**12 (41.4)**	**8 (88.9)**	**0.01**
MRSA PCR turn around time (min), m (IQR)	129.5 (120-218)	146 (112-159)	0.3
Vancomycin avoided in the ER, n (%)	**0 (0)**	**1 (11.1)**	**.02**
Positive blood or sputum cultures for MRSA, n (%)	0	0	-
Vancomycin level drawn, n (%)	12 (41.4)	2 (22.2)	0.3
Hospital length of stay (days), m (IQR)	7 (3-12)	5 (4-6)	0.97
Death during admission, n (%)	6 (20.7)	1 (11.1)	0.52

Results Continued

Number of patients who received one dose of Vancomycin prior to MRSA PCR Result



Conclusion

- More patients in intervention group had empiric dose of vancomycin held prior to MRSA PCR result
- More patients in the control group had vancomycin levels drawn
- Data collection is currently ongoing, and results presented are preliminary data

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Disclosure

The authors have nothing to disclose concerning possible financial or personal relationships with commercial entities

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