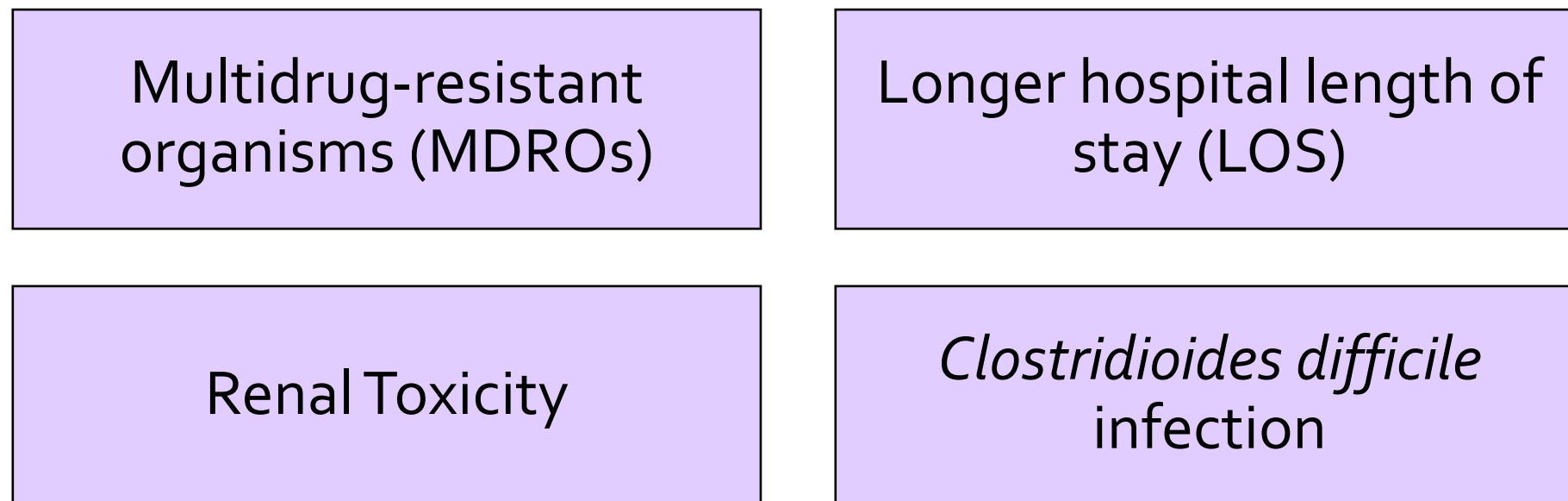


Clinical Utility of Methicillin Resistant *Staphylococcus Aureus* (MRSA) Nasal PCR to Streamline Antimicrobial Use in Treatment of Diabetic Foot Infection (DFI) with or without Osteomyelitis (OM)

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Background

- Inappropriate use of broad-spectrum antibiotics is an ongoing **global health emergency**.

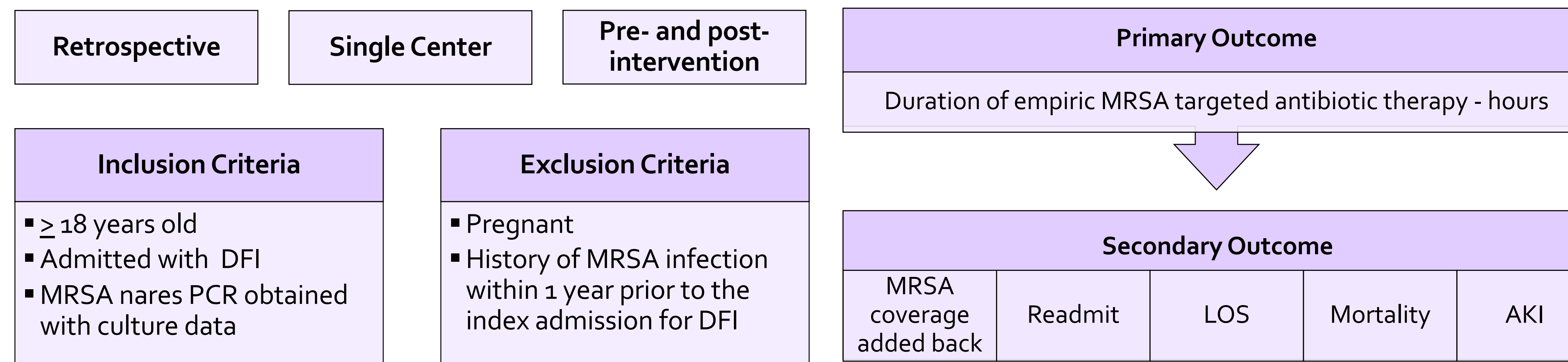


- DFI guidelines recommend empiric MRSA-targeted therapy in cases of high prevalence or severe infection; however, they do not make recommendations on de-escalation.
- This increases unnecessary use of broad-spectrum antibiotics, which has prompted investigation for strategies to **optimize** antibiotic use.
- One emerging strategy is the **utilization of MRSA nasal PCR**.
 - ✓ The MRSA nasal PCR has been utilized for MRSA-targeted therapy de-escalation in pneumonia (PNA), given negative predictive values (NPV) have been >90% in various studies.
 - ✓ There is growing literature to suggest MRSA nasal PCR also carries high NPV in DFI similar to what has been seen in PNA.
- In response to local data demonstrating a 94% NPV for MRSA nasal PCR in DFI, our institution implemented an intervention to utilize this test for early de-escalation or avoidance of empiric MRSA-targeted antibiotics in DFI.

Objective

- This study evaluates the effect of MRSA nasal PCR testing on MRSA-targeted antimicrobial use and clinical outcomes in patients with DFI with or without OM.

Methods



Results

Table 1. Baseline Characteristics

| | PRE (n = 83) | POST (n = 67) | P-value |
|----------------------------|------------------|------------------|---------|
| Age (median [IQR]) | 66.8 [56.1-72.9] | 63.7 [55.7-68.5] | 0.11 |
| Male (%) | 97.6 | 97.1 | 1.00 |
| A1C (mean) | 8.3 ± 2.2 | 8.5 ± 1.9 | 0.63 |
| Comorbid conditions (%) | | | |
| Vascular disease | 27 (32.5) | 22 (32.4) | 0.98 |
| Transplant | 1 (1.2) | 1 (1.5) | 1.00 |
| Malignancy | 11 (13.2) | 2 (2.9) | 0.02 |
| OM | 36 (43.3) | 36 (52.9) | 0.24 |
| Microbiologic cultures (%) | | | |
| Swab | 6 (7.2) | 0 | 0.03 |
| Wound | 33 (39.7) | 26 (38.2) | 0.85 |
| Tissue | 42 (50.5) | 44 (64.7) | 0.08 |
| Abscess | 16 (19.2) | 5 (7.4) | 0.04 |
| Bone | 46 (55) | 30 (44.1) | 0.17 |
| Organisms isolated (%) | | | |
| MRSA | 10 (12.0) | 12 (17.6) | 0.34 |
| MSSA* | 18 (21.7) | 26 (38.2) | 0.03 |
| Other gram positive | 41 (49.3) | 36 (52.9) | 0.66 |
| Gram negative | 38 (45.8) | 18 (26.4) | 0.02 |
| Anaerobes | 14 (16.9) | 8 (11.8) | 0.38 |
| Culture negative | 13 (15.7) | 9 (13.2) | 0.67 |

*Methicillin susceptible *Staphylococcus aureus*

Table 2. Primary Outcomes

| | PRE (n = 83) | POST (n = 67) | P-value |
|--|--------------|---------------|---------|
| Duration of empiric MRSA targeted antibiotic therapy (hours, median [IQR]) | 72 [27-120] | 24 [12-72] | < 0.01 |

Table 3. Secondary Outcomes

| | PRE (n = 83) | POST (n = 67) | P-value |
|---------------------------------------|----------------|----------------|---------|
| MRSA coverage added back for MRSA (%) | 0.0 | 0.0 | --- |
| 9- month readmission (%) | 18.1 | 30.9 | 0.06 |
| LOS (days, median [IQR]) | 8.0 (5.0-13.0) | 9.0 (6.3-14.0) | 0.32 |
| In hospital mortality (%) | 2.4 | 2.9 | 1.00 |
| AKI (%) | 15.7 | 6.1 | 0.07 |

Table 4. NPV of MRSA Nasal PCR in Study Cohort

| | PRE (n = 83) | POST (n = 67) |
|---------|--------------|---------------|
| NPV (%) | 94 | 95 |

Discussion

- A total of 150 patients (of 200 patients screened) were included for analysis (83 PRE; 67 POST). A sample size of 32 patients in total was estimated to meet 80% power.
- There was a significant decrease in empiric MRSA-targeted antibiotic therapy use, from a median of 72 (IQR, 27-120) hours in the PRE group, to 24 (IQR, 12-72) hours in the POST group (p < 0.01).
- Our study has limitations. Some notable include the single-center design and veteran population limit generalizability to other populations and institutions. We also did not assess emergency department or outpatient antibiotic hours, so the reported empiric MRSA-targeted antibiotic therapy use in hours may be underestimated since DFI are treated for 2-6 weeks depending on OM presence.

Conclusions

- This study of patients presenting to a VA hospital with DFI identified a statistically significant decrease in median duration of inpatient MRSA-targeted antibiotic use post-protocol implementation. This suggests a favorable effect of MRSA nasal PCR for de-escalation or avoidance of MRSA-targeted antibiotics in DFI.

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Disclosures

The authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have direct or indirect interest in the subject matter of this presentation.

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