



## INTRODUCTION

Methicillin-resistant *Staphylococcus aureus* infections are serious infections that are becoming more common and more difficult to treat. Clinical or microbiological failures occur in a substantial proportion of invasive MRSA infections treated with vancomycin. Therapy failure is associated with worse clinical outcomes.

The IDSA recommends change in therapy when vancomycin failure occurs, with daptomycin being a possible alternative if susceptible. However, cases of therapy failure associated with the emergence of daptomycin-nonsusceptible (DNS) MRSA strains have been documented.

The data to guide the management of patients with isolates that are nonsusceptible to both vancomycin and daptomycin and who are experiencing failure of therapy is limited. Further studies are needed to guide clinical decision making in such difficult to treat MRSA infections.

## OBJECTIVES

This study describes the treatment and outcomes of patients with DNS MRSA BSI at our healthcare center.

## METHODS

- This is a retrospective review of patients with DNS (defined as daptomycin MIC >1.0 µg/mL) MRSA BSI at a tertiary healthcare center in Detroit, Michigan between 9/24/2005 and 3/31/2018.
- The variables collected were: source of BSI, inpatient and discharge antibiotic therapy, BSI duration, in-hospital and 90-day mortality, and 90-day MRSA BSI recurrence.
- Inpatient therapy was defined as therapy used for the longest number of consecutive days from index DNS MRSA blood culture during hospitalization.
- Discharge therapy was defined as therapy used post-discharge or therapy administered on the date of expiration.
- Therapy used for ≤ 2 days was excluded.

## RESULTS

- A total of 32 non-duplicate patients with DNS MRSA BSI were identified.
- One patient with an inaccessible chart was excluded.
- The source of BSI was endovascular in 9 (29%) pts, secondary BSI in 14 (45%), central-line associated in 3 (10%), and unclear in 5 (16%).

Table 1: treatment and outcome of patients with DNS MRSA BSI

Inpatient therapy	Discharge therapy (n)	In-hospital mortality n(%)	90-day mortality n(%)	Mean BSI duration (days)	90-day BSI recurrence n(%)
van (10)	van (8) cef (1) dap + cef (1)	3(30)	4(40)	2.9	3(30)*
dap + cef (5)	cef + dap (3) cef + van (1) van (1)	0(0)	0(0)*	4.4	1(20)**
lin ± gen ± rif (5)	lin (3) van + sxt (1) quin/dal (1)	1(20)	3(60)	6.8	1(20)
other (11)		4(36)	4(36)	3.5	2(22)*
<b>Totals</b>		<b>6(26)</b>	<b>11(35)</b>	<b>4.4</b>	<b>7(23)</b>

Van=vancomycin; dap=daptomycin; cef=ceftaroline; gen=gentamycin; rif=rifampin; lin=linezolid; sxt=TMP-SMX;  
quin/dal=quinupristin/dalfopristin.  
\*1 pt with unknown status  
\*\* 3 pts with unknown status

## RESULTS

- A total of 24 different antibiotic regimens were used to treat DNS MRSA BSI in this cohort.
- Vancomycin monotherapy was the most commonly used regimen, followed by daptomycin + ceftaroline.
- The majority of the patients received at least two different regimens for therapy of the DNS MRSA BSI.
- Dap + cef was associated with the least in-hospital and 90-day mortality.

## CONCLUSION

- ✓ A wide variation in the therapy of DNS MRSA BSI was seen in this cohort, which makes it difficult to draw a convincing conclusion regarding the optimal treatment.
- ✓ This further highlights the lack of evidence-based data to guide the management of a such difficult infection.
- ✓ In our cohort, vancomycin monotherapy was the most commonly used therapy. Dap + cef had the least in-hospital and 90-day mortality.

## FUTURE DIRECTIONS

- Prospective randomized trials.
- In vitro antibiotic synergy studies and studies looking at the activity of other antibiotics against the DNS MRSA isolates.
- DNA sequencing to determine genetic basis for daptomycin nonsusceptibility.

## REFERENCES

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