



Evaluation of Optimal Treatment Strategy of Skin and Soft Tissue Infections with Uncomplicated Methicillin-Resistant *Staphylococcal Aureus* Bacteremia

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Abstract

Introduction: Skin and soft tissue infections (SSTI) are amongst the most common causes of uncomplicated methicillin-resistant *Staphylococcal aureus* bacteremia (UMRSAB), with significant economical and clinical implications. There is limited clinical data to suggest optimal treatment duration and use of oral antibiotics in the management of UMRSA due to SSTI, after appropriate surgical intervention and initial intravenous (IV) therapy.

Methods: This was a retrospective cohort study, conducted in an integrated 4-hospital health system in Southeast Michigan from 2005 - 2015. Data was collected via electronic medical record. Patients were considered to have UMRSA if they met the following criteria: absence of a positive follow up blood cultures 72 hours after the initial set, absence of endocarditis, osteomyelitis, metastatic site infection, prosthetic implants and grafts. Group I included patients treated for < 14 and group II included patients treated for ≥ 14 days. Both groups received IV therapy with and without oral antibiotics. Univariate two-group comparisons were done using chi-square test or Fisher's exact test. All analyses were performed using SAS 9.4. (SAS Institute Inc, Cary, NC, USA).

Results: Of 1251 consecutive patients with methicillin-resistant *Staphylococcus aureus* bacteremia, we identified 115 patients with UMRSA secondary to SSTI. Group I had 33 (29%) patients and group II had 82 (71%) patients. The mean age was 55.0 ± 17.0 years. The two treatment groups had similar baseline comorbidities. Both groups treated with IV antibiotics only, had higher 30 days recurrence, though statistically non-significant.

Conclusions: Our study with a small sample size, did show statistically significant 90 days mortality in patients treated with combination therapy for ≥ 14 days. Further, prospective multicenter trials are needed to evaluate optimal treatment strategy for UMRSA with SSTI.

Introduction

- Skin and soft tissue infections (SSTI) are amongst the most common causes of uncomplicated methicillin-resistant *Staphylococcal aureus* bacteremia (UMRSAB), with significant economical and clinical implications.
- There is limited clinical data to suggest optimal treatment duration and use of oral antibiotics in the management of UMRSA due to SSTI, after appropriate surgical intervention and initial intravenous (IV) therapy.

Objective

The objectives of this study were to

- Compare recurrence and mortality rate in patients with UMRSA due to SSTI treated for <14 days vs ≥14days
- Compare the outcomes in patient treated with IV only vs combination therapy.

Methods

This was a retrospective cohort study, conducted in an integrated 4-hospital health system in Southeast Michigan from 2005 - 2015. Data was collected via electronic medical record.

Methods

Patients were considered to have UMRSA if they met the following criteria:

- Absence of a positive follow up blood cultures 72 hours after the initial set
- Absence of endocarditis, osteomyelitis
- Metastatic site infection
- Prosthetic implants and grafts.

Group I included patients treated for < 14 and **group II** included patients treated for ≥ 14 days. Both groups received IV therapy with and without oral antibiotics.

Statistical analysis

Univariate two-group comparisons were done using chi-square test or Fisher's exact test. All analyses were performed using SAS 9.4. (SAS Institute Inc, Cary, NC, USA).

Results

Of 1251 consecutive patients with methicillin-resistant *Staphylococcus aureus* bacteremia, we identified 115 patients with UMRSA secondary to SSTI. Group I had 33 (29%) patients and group 2 had 82 (71%) patients. The mean age was 55.0 ± 17.0 years. The two treatment groups had similar baseline comorbidities. Both groups treated with IV antibiotics only, had higher 30 days recurrence, though statistically non-significant.

Table 1. Demographics and clinical characteristics of patients with UMRSA bacteremia according to total duration of antibiotic therapy

Characteristics	Group I (<14 days) n= 33	Group II (≥14days) n= 82
Demographics		
Age mean	58.2 (±17.4)	60.0 (±17.7)
Female	14 (42%)	33 (40%)
Male	19 (57%)	49 (59%)
Epidemiologic source		
Community Onset	20 (6%)	46 (56%)
Health care associated	9 (27%)	27 (32%)
Hospital acquired	4 (12%)	9 (11%)
Comorbidity		
Immunosuppression	1 (3%)	5 (6%)
Malignancy	3 (9%)	12 (15%)
IVDA	7 (21%)	13 (16%)
Heart disease	3 (9%)	14 (17%)
PVD	6 (18%)	12 (15%)
GI disease	3 (9%)	13 (16%)
DM	9 (27%)	32 (40%)
HD dependence	1 (3%)	5 (6%)
Renal disease	4 (1%)	17 (20%)
Liver cirrhosis	0	1 (1%)
HIV	1 (3%)	2 (2%)

Table 2. Group 1 <14 days comparison

Outcomes	IV only n= 21	IV + Oral n= 12	p value
Recurrence in 30 days	2 (9.5%)	0	NS
30 days Mortality	0	0	NS
60 days Mortality	0	0	NS
90 days Mortality	1 (4.8%)	0	NS

Table 3. Group 1 ≥14 days comparison

Outcomes	IV only n=63	IV + Oral n =19	p value
Recurrence in 30 days	5 (8%)	1 (5%)	NS
30 days Mortality	0	1 (5%)	NS
60 days Mortality	1 (1.5%)	1 (5%)	NS
90 days Mortality	3 (4.8%)	4 (21.1%)	0.047

Limitations

The limitations of this study are

- Retrospective and single center study
- Non-randomized analysis
- Small sample size

Conclusion

- Our study with a small sample size, did show statistically significant 90 days mortality in patients treated with combination therapy for ≥ 14 days.
- Further, prospective multicenter trials are needed to evaluate optimal treatment strategy for UMRSA with SSTI.

Bibliography

1. Liu C, Bayer A, Cosgrove SE, et al. Clinical practice guidelines by the IDSA for treatment of MRSA infection in adults and children. Clin Infect Dis. 2011
2. Chong YP, Moon SM, Bang K-M, et al. Treatment Duration for Uncomplicated *Staphylococcus aureus* Bacteremia To Prevent Relapse: Analysis of a Prospective Observational Cohort Study. *Antimicrobial Agents and Chemotherapy*. 2013
3. Chang FY, Peacock JE Jr, Musher DM, et al. *Staphylococcus aureus* bacteremia: recurrence and the impact of antibiotic treatment in a prospective multicenter study. *Medicine (Baltimore)*. 2003
4. V Wong et al. Audit of treatment of *Staphylococcus aureus* bacteremia. *Clinical Medicine*. 2010
5. Jernigan JA, Farr BM. Short-Course Therapy of Catheter-related *Staphylococcus aureus* Bacteremia: A Meta-Analysis. *Ann Intern Med*. 1993