Assessment of Potential Cost Avoidance with Dalbavancin in Emergency Department Use

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Background

Dalbavancin is a lipoglycopeptide antibiotic indicated for acute bacterial skin and skin-structure infections (ABSSSI) given as a 1500 mg one-time, 30-minute infusion with a long duration of action of about 8 days.[1] The most common causes of ABSSSI are gram positive bacteria streptococcus and staphylococcus including methicillin-resistant *Staphylococcus aureus* (MRSA). Current standard of care for less severe ABSSSI include oral outpatient antibiotics and for more severe infections, patients require hospital admission for anti-MRSA antibiotics like vancomycin or daptomycin. Dalbavancin offers a potential alternative to current inpatient standard of care while avoiding admission. Several studies in the inpatient setting have indicated cost avoidance and similar efficacy with dalbavancin administration at discharge compared to standard care, showing the impact on length of stay (LOS) to be 3.7 days.[2,3] Hospital admission avoidance with dalbavancin emergency department (ED) administration has not previously been well documented. The purpose of this study is to determine the number of patients admitted with ABSSSI who would have qualified for dalbavancin administration in the ED.

Objectives

Primary Outcome

- To estimate the number of patients diagnosed with ABSSSI in the ED and hospitalized that would meet criteria for empiric antibiotic treatment with dalbavancin

Secondary Outcome

- To determine the potential length of stay avoided by dalbavancin use in the ED
- To determine potential cost avoidance associated with prevention of admission for the ABSSSI patient diagnosed in the ED
- To compare patient arrival time in the ED with pharmacist availability
- To assess rates of treatment-related adverse events (ADE) among patients hospitalized with ABSSSI: Acute kidney injury (AKI), phlebitis, red man syndrome, *C. difficile* infection

Methods and Materials

- Retrospective chart review (March 1, 2019 to March 1, 2020)
- Power was not calculated for primary outcome due to lack of comparator group
- Number of charts reviewed was determined based on published data and of number of patients presenting to the ED with cellulitis
- Cost avoidance was based of Kaiser Health Facts survey 2019 for Missouri hospitals average cost per admission day[4]

Eligibility Criteria

- 18 years of age or older
- Received empiric antibiotic therapy for gram-positive bacteria
- Diagnosed with ABSSSI in the ED

Ineligibility Criteria

- Pregnancy
- Known hypersensitivity to lipoglycopeptide antibiotics
- Hemodialysis
- Hepatic insufficiency (Child-Pugh score B/C)
- If administration of dalbavancin would not have prevented admission
- Patient was a candidate for oral outpatient antibiotics

Results

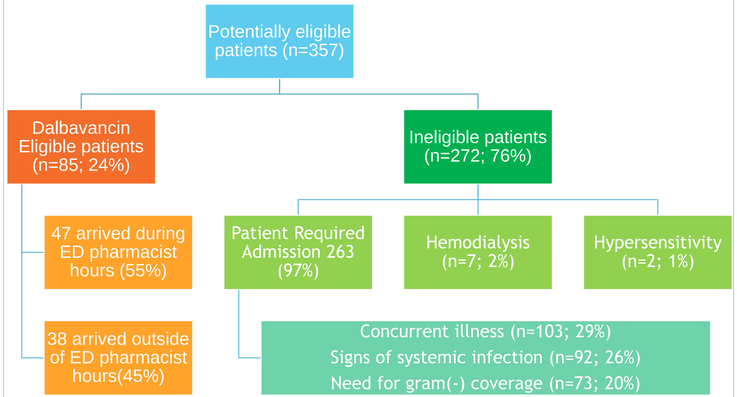

Figure 1: Of the 357 patients seen in the emergency room with ABSSSI only 85 (24%) were eligible to receive dalbavancin and potentially avoid admission. 47 (55%) of those patients arrived during ED pharmacist coverage

- There were no statistically significant differences in baseline characteristics
- There could have been 318 potentially prevented admission days with dalbavancin use (average 3.74 days)
- There were no statistically significant differences in ADEs between groups

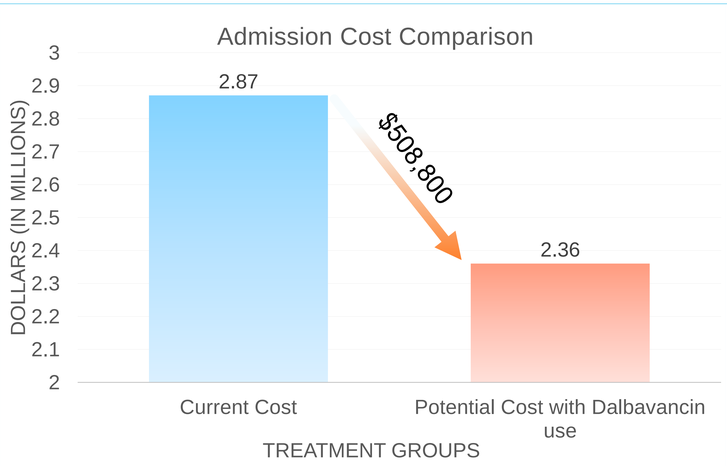

Figure 2: Potentially avoiding admission through ED use of dalbavancin would lead to an estimated cost avoidance of $508,800

Discussion

Of the 357 patients seen in the emergency room with ABSSSI only 85 (24%) were eligible to receive dalbavancin and potentially avoid admission. Avoiding admission by use of dalbavancin could have prevented 318 admission days (an average 3.74-day LOS) leading to an estimated cost avoidance $508,800. The results of this study show a meaningful reduction in admissions and cost avoidance.

Strengths:

- Strong external validity due to clear repeatable eligibility criteria for dalbavancin use
- Outcomes regarding LOS reduction were similar when compared to previous studies evaluating dalbavancin use at hospital discharge (3.74 vs 3.7 days)
- Daily admission costs were state specific based on recent data from 2019 Kaiser State Health Facts

Limitations:

- Power could not be calculated due to lack of true comparator group
- Retrospective data
- Incomplete or inaccurate physician charting
- No true intervention was evaluated

Future Direction:

Of the 272 (76%) patients who were ineligible, 73 (20%) required gram-negative coverage and may have potentially been able to avoid admission provided an oral fluroquinolone would have been appropriate. A pharmacist lead multi-disciplinary dalbavancin screening process would aid in determining eligible patients and will need future studies to evaluate its effectiveness.

Conclusion

Though only a small number of the patients in the ED who presented with ABSSSI were eligible for dalbavancin use, avoiding admission can lead to substantial cost savings. The implementation of a multi-disciplinary dalbavancin screening process would be reasonable based on the finding of this study. Future studies evaluating the accuracy and cost savings of such a process would be needed.

Disclosure Statement

- The personnel involved in this study have nothing to disclose at this time

References

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