Patient Preferences in the Emergency Department (ED) for Treatment of Acute Bacterial Skin and Skin Structure Infection (ABSSSI)

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ABSTRACT (modified)

Background: Reducing hospital admission and improving transitions of care can lessen the burden of ABSSSIs in EDs and hospitals. Limited research to date has assessed the patient's preference for ABSSSI treatment. Understanding patient preferences may provide insights that encourage optimal treatment plans and improve satisfaction with their care.

Methods: A patient survey was conducted across 6 hospital EDs in the US. After providing informed consent, patients with ABSSSI completed a baseline survey assessing preferences for antibiotic (ABX) therapy [intravenous (IV) versus oral] and treatment location. Patient characteristics and ensuing treatment details were collected from the medical record after the ED or hospitalization was completed. A follow-up survey was conducted by telephone within 30 to 40 days after ED discharge to confirm patient preferences for ABX therapy and treatment location, as well as assess satisfaction with care. Univariate analyses were conducted to determine patient characteristics predictive of preferences for treatment (disposition or ABX).

Results: A total of 155 patients were enrolled, and 94 patients completed both baseline and follow-up surveys. The mean ± SD age of the 94 patients was 53 ± 15 years, 30 (31.9%) had diabetes, and 60 (63.8%) had a previous ABSSSI. The median (25th-75th quartile) lesion size was 274 (100-667.5) cm²; 68 (72.3%) presented with cellulitis, an abscess, or both. Sixty-nine (73.4%) were admitted to the hospital with a median (25th-75th quartile) length of stay of 4 (2, 7) days. In the ED, vancomycin (55.7%) and beta-lactams (54.5%) were the most common ABX; IV was prescribed in 74 (85.1%) patients. Once admitted, 53 (79%) and 55 (77.6%) of patients received vancomycin and beta-lactams, respectively. Most employed patients (67.5%) reported missing up to one week of work for ABSSSI treatment. When surveyed, 38 (40.4%) patients preferred to receive ABX at home, while 24 (25.5%) chose hospital stay for one or more nights. Most patients (44.7%) did not have a preference for oral versus IV ABX, and the most important ABX factors to patients were efficacy and their doctor's opinion. No baseline patient characteristic was significantly associated with preference for treatment (disposition or ABX).

Conclusions: In these patients presenting to the ED with ABSSSI, the majority were admitted to the hospital and received IV ABX. Patient preferences for treatment location and ABX route varied, and no identifiable patient characteristics predicted preference. These data suggest opportunities for improving ABSSSI care by engaging the patient and offering treatment alternatives they may not be aware of.

INTRODUCTION

- Antibiotics (ABX) are a vital component in the treatment of ABSSSI, with each agent differing in efficacy and effectiveness in a real-world setting, and potential benefits in terms of convenience for patients with ABSSSI.
- For patients with ABSSSI presenting to the ED, treatment choices typically fall into one of four major strategies: 1) discharge home immediately on oral ABX, 2) receipt of IV in the ED followed by discharge home on oral, 3) receipt of IV in the ED followed by admission to hospital for further management, and 4) use of one of the newer long-acting agents in the ED followed by discharge to complete care in outpatient setting (1).
- Given fiscal challenges, hospitals must consider strategies to optimize patient outcomes while minimizing unnecessary admission and cost. Understanding patient characteristics to indicate preference for treatment at home, oral ABX, or both, further identify opportunities to improve patient satisfaction.
- There are no known studies to date that describe patient factors associated with preferences for treatment at home (versus in the hospital) or with oral (versus IV) ABX.

OBJECTIVES

- The primary objective was to determine patient preferences for treatment of their ABSSSI and what factors might influence those specific preferences.
- A secondary objective was to determine patient satisfaction with the actual treatment received.

METHODS

- The study was conducted at six participating hospitals in the United States; approved by the IRB at each participating center; all participants provided written informed consent.
- Eligible patients included adults (>/= 18 years old) presenting to the ED with ABSSSI (cellulitis or erysipelas, cutaneous abscess, wound infection, or any combination of these), ability to speak and write English, and availability for follow-up telephone survey.
- Patients were excluded for the following reasons:
  1. Acutely ill meeting CMS definition of severe sepsis, which included one of the following: systolic blood pressure < 90 mmHg, mean arterial pressure < 60 mmHg, or serum lactate > 2.0 mmol/L (after an initial fluid challenge)
  2. Suspected necrotizing fasciitis
  3. Suspected osteomyelitis
  4. Lesion size <75 cm² was limited to no more than 20% (~6 patients) at each site to be consistent with the FDA definition for ABSSSI
- After enrollment, a 12 question baseline survey was administered in the ED to assess ABSSSI history, preferences for ABSSSI treatment (including most important ABX factors), education level and employment.
- Participants were treated with standard of care and additional data (demographics, co-morbidities, Charlson comorbidity index, and details of treatment disposition) were collected from the medical chart.
- A 39 question follow up telephone survey was administered between 30 and 40 days after ED discharge to assess preferences for ABSSSI treatment and satisfaction with ABSSSI care.
- Primary study group were those who completed both baseline and follow up surveys.
- Univariate analyses (SigmaPlot Version 13, Systat Software, San Jose, CA) were conducted to understand drivers behind patient preference. An *a priori* p-value of < 0.05 was defined as statistically significant.

RESULTS

- A total of 155 patients were enrolled and completed the baseline survey; all patients met inclusion/exclusion criteria; 61 (39%) patients were lost to follow up, leaving 94 patients who completed the telephone survey for the final analyses: n=24 (Hartford, CT); n=16 (Cape Fear, NC); n=21 (Baylor, TX); n=19 (Univ. Colorado, CO); n=12 (Baptist-Memphis, TN); n=2 (Baystate, MA).
- Demographics and infection characteristics are provided in **Table 1**. Demographics were similar between the original 155 enrolled and final 94 patients (primary study group).
- ED disposition, hospital disposition, and ABX treatment details are provided in **Table 2.**
- Of patients who were working at the time of their ABSSSI (n=40; 42%), 67.5% reported missing up to 1-7 days of work, 17.5% about 1-2 weeks, 20% greater than 2 weeks, and 12.5% reported no work missed.
- **Figure 1** displays patient survey responses to preferences for treatment location and ABX administration.
- There were no patient factors that were found to be statistically significant in predicting patient preference for disposition or treatment.
  - 57.1% of patients with at least a 4 year college education versus 33.3% of patients with lower education selected a preference for home treatment (p=0.055)
  - 25% of patients with at least 4 year college education versus 14.6% of patients with lower education preferred treatment with an oral ABX (p=0.054)
  - Patients with a history of ABSSSI were less likely to prefer oral ABX (8.3% versus 30.8%, p=0.061)
- When directly asked if participants would value a single IV ABX dose that prevented hospital admission, 78 (83.0%) indicated definitely or probably so.
- **Figure 2** displays scores for ABX, ED, Post-ED Care, and Hospital Satisfaction.
- **Table 3** displays ABX factors most important to patients for treatment of ABSSSI

Table 1: Patient participant and infection characteristics

	n= 94
Female Gender	44 (46.8)
Age (years), mean ± standard deviation (SD)	53 ± 15
Charlson Comorbidity Index, median (25th, 75th quartile)	2 (0, 4)
Comorbidities on Presentation	
Diabetes	30 (31.9)
Peripheral Vascular Disease	8 (8.5)
Race	
White	76 (80.9)
Black/African American	17 (18.1)
4 Year College Education or Greater	28 (29.8)
Employed at time of ABSSSI	40 (42.6)
History of Previous ABSSSI	60 (63.8)
Relapse/failure/readmission for an ongoing ABSSSI episode (n=60)	29 (48.3)
Fever on ED Presentation	9 (9.6)
Abnormal WBC on ED Admission (cells/mm³)	46 (29.7)
Approximate Size of ABSSSI (cm²), median (25th, 75th quartile)	274 (100, 668)
>/= 75 cm²	78 (83)
Type of Skin Infection*	
cellulitis/erysipelas	65 (69.1)
cutaneous abscess	21 (22.3)
wound infection	26 (27.7)

All data presented as number (percent of total), unless otherwise noted.
*Total >n=94 because categories are not mutually exclusive.

Table 2: Disposition and treatment details

	n= 94
ED Length of Stay (LOS) (hours), median (25th, 75th quartile)	7.1 (4.6, 15.0)
ABX Treatment in ED	
IV Only	74 (85.1)
PO Only or IV plus PO	13 (14.9)
Vancomycin	49 (55.7)
Beta-lactam	48 (54.5)
Clindamycin	17 (19.3)
ED Disposition	
Home	25 (26.6)
PO ABX (n=25)	24 (96.0)
Hospital Admission	69 (73.4)
Hospital LOS (days), median (25th, 75th quartile) (n=69)	4 (2, 7)
ABX Treatment in Hospital	
Vancomycin	53 (79.1)
Beta-lactam	52 (77.6)
Hospital Disposition	
Home	60 (87.0)
Skilled Nursing Facility	9 (13.0)
ABX Route on Hospital Discharge (n=58)	
IV ABX only	13 (22.4)
PO ABX only	44 (75.9)

All data presented as number (percent of total), unless otherwise noted.

Figure 1: Patient survey responses to preferences for Treatment Location and Route of ABX Administration

Treatment Location (ED Only 1%, SNF/Rehabilitation 4%, Hospital 26%, No Preference 29%, Home 40%)

Route of Administration (IV Only 11%, IV then Oral 12%, Oral Only 14%, Single IV Dose 19%, No Preference 45%)
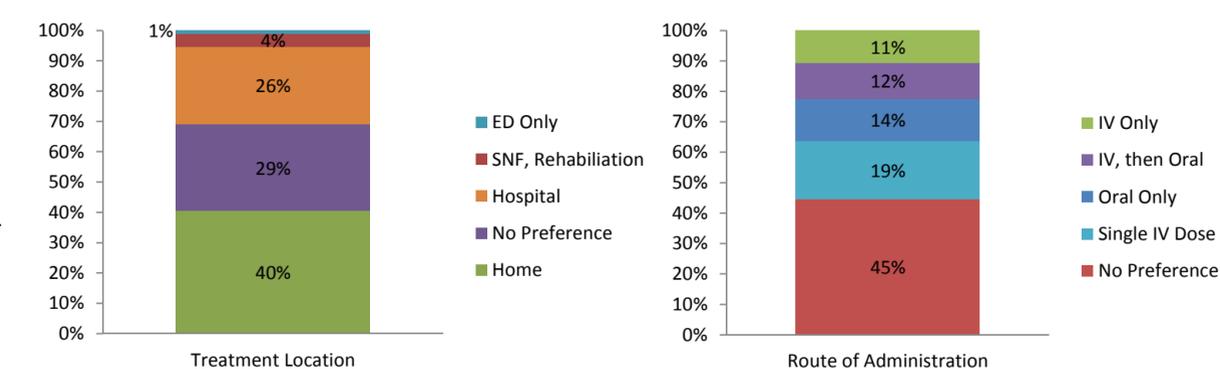
Figure 2. Median, 25th & 75th quartile, and range of satisfaction scores for ABX treatment, ED treatment, Post-ED care, and Hospital care (0=least satisfied, 10=most satisfied)
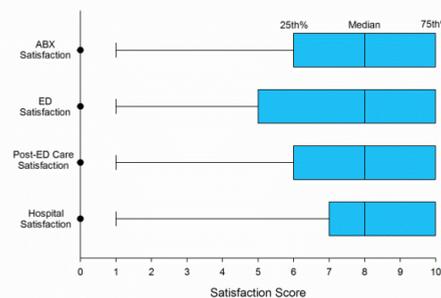

Table 3: ABX factors important to patients for treatment of ABSSSI, ranked by mode (1 = most important; 7 = least important)

Factor	Mode
Efficacy (i.e., just want it to work)	1
My doctor's opinion	1
Route of Administration	3
Convenience (# of doses/days)	4
Treatment Location (home/hospital)	5
Adverse Events	6
ABX Cost	7

DISCUSSION and CONCLUSION

- The majority (73%) of patients presenting to the ED with predominantly larger (>/= 75 cm²) ABSSSI were admitted to the hospital with a median LOS of 4 days, despite having evidence of limited comorbidity (e.g. low Charlson Comorbidity Index). Furthermore, most employed patients reported missing work (88%), highlighting the burden of ABSSSI treatment.
- Most patients received ABX in the ED and hospital if admitted, most commonly IV therapy with vancomycin or a beta-lactam.
- Though most patients were admitted, 40% of patients preferred to be treated at home, while 29% had no preference and only 26% preferred to receive treatment in the hospital.
- Many patients (45%) did not have a preference for oral versus IV ABX therapy, which was, in part, consistent with the rank order of ABX factors most important to patients, where route of administration followed efficacy and doctor's opinion. However, more patients (19%) preferred an antibiotic regimen consistent with long-acting antibiotic therapy (i.e. single IV dose) over other antibiotic treatment regimens.
- Overall, these patients were satisfied with their ABX, ED, Post-ED, and Hospital care; however, the highest Medicare reimbursement rates are only given for the highest satisfaction scores, suggesting opportunity for improvement in satisfaction in many patients.
- These data suggest that opportunities still exist to identify patients who prefer (and are clinically able) to be treated outside of the hospital, with either long-acting antibiotic (consistent with a single IV ABX dosing regimen) or oral antibiotic therapy.
- Since no patient factors predicted preference for treatment consistently, these data suggest opportunities for improving ABSSSI care by engaging the patient and offering treatment alternatives they may not be aware of.

REFERENCES

1. Pollack Jr., CV et al. Acute bacterial skin and skin structure infections (ABSSSI): practice guidelines for management of care transitions in the emergency department and hospital. J Emerg Med 2015;48:508-19.