

Evaluation of Surgical Site Infections in Solid Organ Transplant Recipients with β -lactam Allergies

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Background

- Reported β -lactam allergies (BLA) are common, but reported prevalence in and impact on solid organ transplant (SOT) recipients is limited ¹
- An increase in surgical site infections (SSI) in patients with BLA has been associated with the use of alternative prophylaxis regimen ²⁻⁴
- Aims:
 - Assess prevalence of BLA at time of transplant in our institution
 - Assess alternative SSI prophylaxis use in SOT
 - Compared SSI in patients with BLA vs non-BLA

¹Imlay H et al. *CID* 2019. ²Blumenthal K, et al. *CID* 2017;66(3):329-336. ³Lam P et al. *ICHE* 2020. ⁴Kuriakose J et al. *J Am Coll Surgeons* 2019.

Methods

- Single-center retrospective review Jan 2015 – Dec 2019
- Adults undergoing first heart, kidney, or liver transplant reviewed for:
 - Reported antibiotic allergy and reactions at time of transplant
 - SSI prophylaxis
 - Incidence of National Healthcare Safety Network (NHSN)-defined SSI
- Excluded patients receiving antibiotics at time of transplant for preceding infection

Table 1. Institutional Intraoperative SSI prophylaxis Protocols

Organ	Preferred Regimen	Severe Penicillin Allergy Regimen
Heart	Cefazolin + Vancomycin	Levofloxacin + Vancomycin
Kidney	Cefazolin	Aztreonam + Clindamycin
Liver	Ampicillin-sulbactam	Aztreonam + Vancomycin

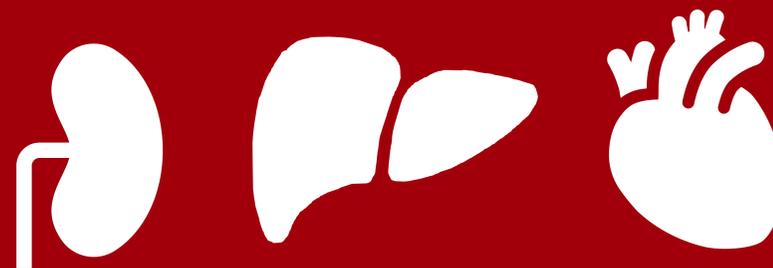
Results

Table 2. NHSN SSI Risk Factors

Patient Characteristics	BLA (n=129)	No BLA (n=621)
Age in years (median)	57	57
Sex – Male (%)	53 (41.4%)	395 (63.5%)
Comorbidities		
Diabetes Mellitus (%)	50 (38.8%)	250 (40.3%)
BMI (median)	28	28
SOT (%)		
Liver	34 (17.6%)	159 (82.4%)
Kidney	70 (16.1%)	365 (83.9%)
Heart	25 (20.5%)	97 (79.5%)

*The NHSN identified the following risk factors for use in calculating the Surgical Site Infection Standardized Infection Ratio (SIR): patient age, sex, BMI, diabetes mellitus, procedure.

[CDC NHSN SIR: Guide to the SIR, March 2019](#)



1 in 6 transplant recipients at our institution report a β -lactam allergy, similar to previously reported rates for the general population.

Incidence of surgical site infections was low overall.

There was no difference between patients reporting BLA vs those who did not, but more data is needed.

Use of first-line SSI prophylaxis could improve overall, regardless of BLA status.

Allergy testing may help.

Results

Figure 1. Reported β -lactam Allergies

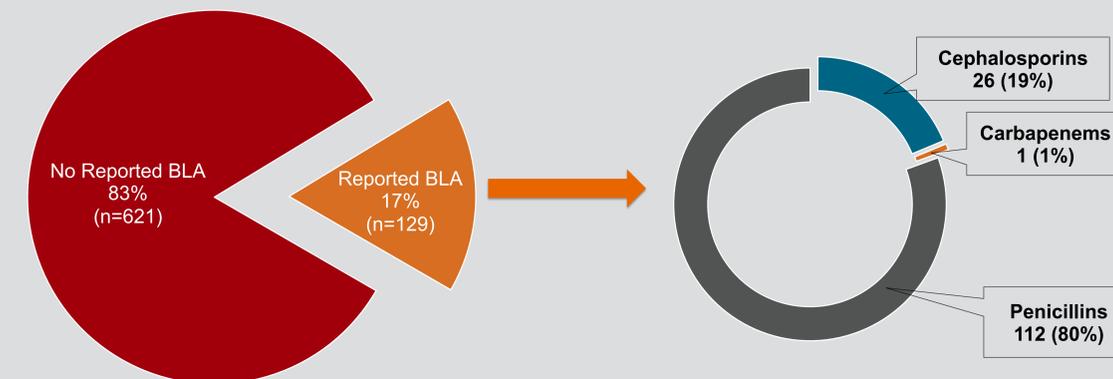
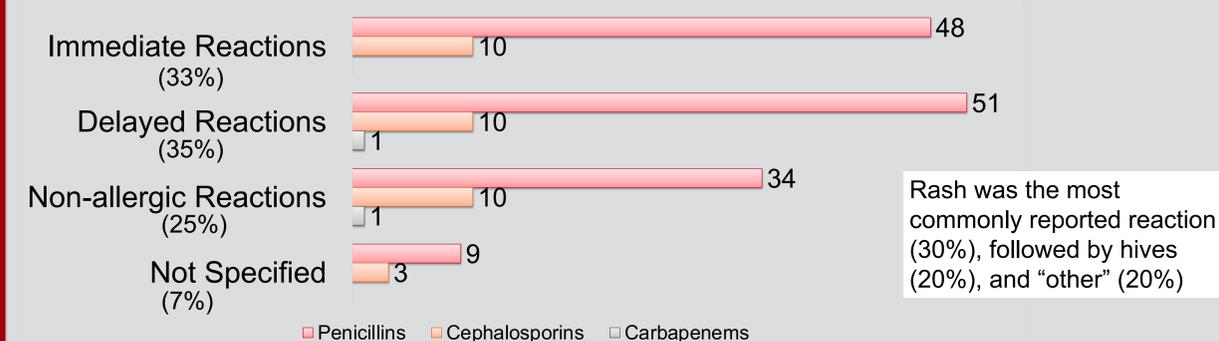


Figure 2. Number of Reported Reactions by β -lactam allergy label



Rash was the most commonly reported reaction (30%), followed by hives (20%), and "other" (20%)

Reactions were categorized according to classification by Blumenthal et al in *The Lancet* 2019. Immediate (IgE-mediated) reactions include hives, anaphylaxis, angioedema, shortness of breath, swelling, hypotension and apnea. Delayed (T-cell mediated) reactions include rash and itching.

Table 3. Outcomes in patients with BLA vs no BLA

Outcomes	BLA (n=129)	No BLA (n=621)	P value
Use of Preferred SSI Prophylaxis Regimen	6 (4.7%)	490 (78.9%)	<0.01
Incidence of SSI	6 (4.7%)	27 (4.6%)	NS
By Transplanted Organ:			
• Heart	2 (1.6%)	5 (0.8%)	
• Liver	3 (2.3%)	13 (2.1%)	
• Kidney	1 (0.8%)	9 (1.4%)	
By SSI Classification			
• Deep infection primary	0 (0%)	1 (0.2%)	
• Intra-abdominal	4 (3.1%)	18 (2.9%)	
• Lung	1 (0.8%)	1 (0.2%)	
• Mediastinitis	0 (0%)	2 (0.3%)	
• Superficial infection primary	1 (0.8%)	5 (0.8%)	

Expectedly, patients reporting BLA did not receive preferred SSI prophylaxis regimen.

However, about 20% of patients without reported BLA also received inappropriate regimen.

There was no difference in the incidence of SSI based on patient-reported BLA status; however, we did not have sufficient SSIs to detect a difference.

Incidence of SSI in transplant recipients at our institution (heart: 6%, liver: 2.5%, kidney: 9.4%) were within nationally reported ranges of SSI, or lower.*

*Surgical Site Infections: 2019 Guidelines from the AST ID Community of Practice.