Antibiotic Class-Based Distribution & Analysis of Reported β-Lactam Allergies Amongst Hospitalized Patients

J. Patrik Hornak, MD & David Reynoso, MD, PhD

Division of Infectious Diseases, Department of Internal Medicine, The University of Texas Medical Branch at Galveston (UTMB Health)

Introduction

Background

- Approx. 10% of pts claim PCN allergy, yet only 10% truly are hypersensitive
- Reported PCN allergy negatively influences prescribing behaviors
- Clinicians may significantly over-estimate β-lactam cross-reactivity
- Alternative abx are associated with *C. difficile* infection, drug-resistance development, poorer outcomes, & increased costs
- "De-labeling" BLA patients = high-yield antimicrobial stewardship (AS) target

Project goals

1) Establish our institution's reported "beta-lactam allergy" (BLA) rate [PCNs & cephalosporins]
2) Surveil BLA rates, by abx class
3) Compare rates of drug-resistant and *C. difficile* infection (CDI) in BLA-reporting and non-reporting pts
4) Identify areas for future study

Methods & Patient Population

- Who: adult inpatients at UTMB Health
- When: Jan 1, 2015 – Dec 31, 2019

n = 118,326 unique pts

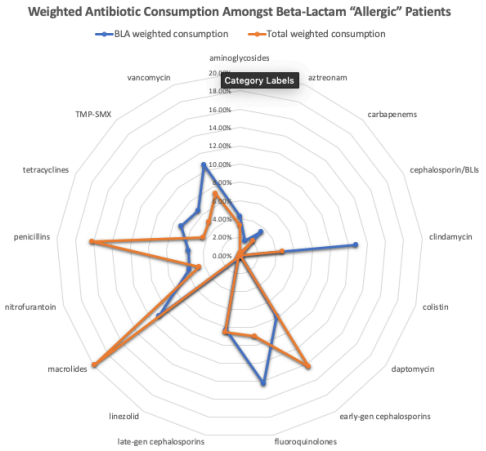
107,344 (90.7%) without BLA

10,982 (9.3%) with BLA

Adverse Outcomes

Abx Consumption (by class)

Results: Antibiotic Utilization



Results: Allergy Frequency

Drug Received	Pts citing BLA
Aztreonam	85.9%
Clindamycin	33.6%
Cephalosporin/βLI combo	29.2%
Daptomycin	25.9%
Carbapenems	20.3%
Linezolid	19.8%
Tetracyclines	19.7%
Fluoroquinolones	19.6%
Vancomycin	17.9%
TMP-SMX	16.4%
Aminoglycosides	15.8%
Colistin	15.6%
Nitrofurantoin	15.2%
3rd/4th/5th G cephalosporins	11.9%
MEAN	**9.3%**
Macrolides	6.8%
1st/2nd G cephalosporins	6.7%
Penicillins	4.3%

Adverse Outcomes

Non-BLA patients (n = 107,344) vs. BLA patients (n = 10,982)

	Non-BLA	BLA		
• MRSA colonization	432	88	OR 1.99 (1.58-2.52)	p<0.0001
• MRSA infection	1642	333	OR 2.01 (1.79-2.23)	p<0.0001
• Quinolone resistance	41	10	OR 2.38 (1.19-4.76)	p<0.0137
• Vancomycin resistance (e.g. VRE)	94	26	OR 2.71 (1.75-4.18)	p<0.0001
• β-lactam resistance (e.g. ESBL)	646	136	OR 2.07 (1.72-2.49)	p<0.0001
• *C. difficile* infection	721	136	OR 1.85 (1.54-2.23)	p<0.0001

Conclusions

- Our BLA rate matches broad expectations (~10%)
- BLA labeling linked to more CDI & drug-resistant infections
- Certain alt. drugs/classes are disproportionately used by BLA-reporting patients (eg, aztreonam, clindamycin)

Future Directions

- Analysis by allergy severity, infection-type, abx duration
- Targeted AS interventions (eg, PCN skin tests)
- Clinician education initiatives

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