Urine-specific Ampicillin Breakpoints to Improve Treatment of Enterococcal Urinary Tract Infections

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Abstract #6916

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Introduction

- In January 2014, UCLA increased the susceptible breakpoint (BP) for ampicillin from ≤ 4 to ≤ 128 mg/mL for *Enterococcus* isolated in urine.
- Vancomycin-resistant enterococcus (VRE) infections, in particular VRE bacteriuria, present a large burden to patients, providers, and the overall healthcare system.
- Treatment of choice for VRE UTIs is ampicillin when the organism is susceptible to this antibiotic.
- Significantly higher concentrations of ampicillin are achieved in the urine compared to the serum.
- Using aminopenicillins to treat VRE UTIs with an MIC ≤ 128 mcg/mL is supported by pharmacokinetic data.

Objectives

1. Improve antimicrobial utilization and reduce unnecessary exposure to broader and more costly agents.
1. Evaluated impact of the new antibiotic susceptibility criteria on prescribing practices.

Methods

- Retrospective chart review.
- Inclusion criteria: adult patients at UCLA with *Enterococcus* isolated from urine cultures with susceptibility data between 9/25/13 and 3/27/14.
- Exclusion criteria: those without susceptibility data.
- Outcomes: Antibiotic prescriptions and rates of ampicillin-susceptible *Enterococcus*.
- Analyses: descriptive statistics and chi-square test.

Results

Table 1. Characteristics of overall cohort

	Overall cohort (n = 203)	Pre-BP change (n = 106)	Post-BP change (n = 97)	*p-value*
Gender				*0.83*
Men	**74**	42	32	
Women	**129**	64	65	
Median Age (IQR)	**69 (46.75 - 82)**	67.5 (40.75 - 82)	69 (46.5 – 82)	*0.25*
Patient setting				*0.0096**
Inpatient	**116**	52	64	
Outpatient	**87**	54	33	
Ampicillin susceptible (% of total)	**179 (88.2%)**	86 (81.1%)	93 (95.9%)	*0.5*
Aminopenicillin prescribed	**57**	24	33	*1.00*

*p-value <0.05 considered statistically significant

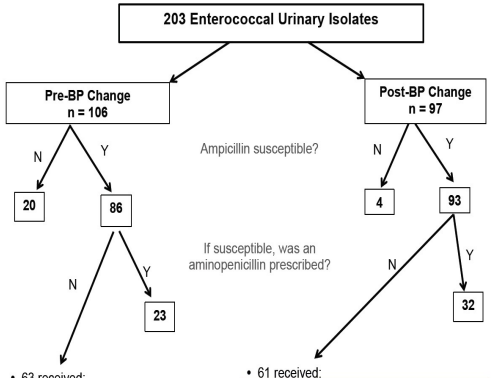
Table 2. Characteristics of VRE subcohort (n = 33)

	PRE-BP change (n = 17)	POST-BP change (n = 16)	*p-value*
Gender			*0.28*
Men	4	7	
Women	13	9	
Median Age (IQR)	80 (56.5 – 84.5)	79.5 (64 – 89)	*0.98*
Patient setting			*1.00*
Inpatient	12	11	
Outpatient	4	5	
Ampicillin susceptible (% of total)	2 (11.8%)	12 (75%)	*0.0004**
Aminopenicillin prescribed	2	6	*0.12*

*p-value <0.05 considered statistically significant

Results

Figure 1. Prescribing practices for overall cohort



- 63 received:

Number	Drug Class
1	Aminoglyocoside
10	Cephalosporin
6	Fluoroquinolone
1	Monobactam
8	Nitrofuran
21	No antibiotics
2	Pipercillin-Tazobactam
4	Tetracycline
6	Vancomcyin
4	>1 antibiotic, not an aminopenicillin

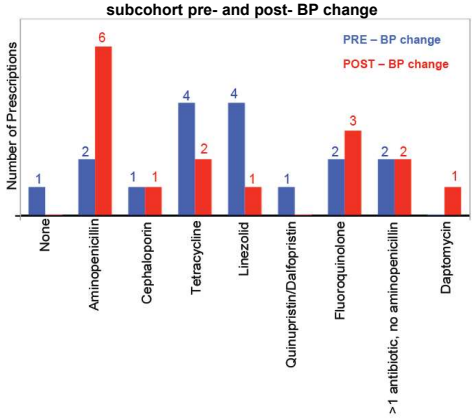
- 61 received:

Number	Drug Class
4	Carbapenem
8	Cephalosporin
1	Cranberry supplements
1	Daptomycin
16	Fluoroquinolone
3	Linezolid
6	Nitrofuran
9	No antibiotics
5	Pipercillin-Tazobactam
1	Tetracycline
1	Trimethoprim/Sulfamethoxazole
3	Vancomycin
3	>1 antibiotic, not an aminopenicillin

Reasons for not prescribing an aminopenicillin:
- Provider preference
- Asymptomatic bacteriuria
- Patient allergy/intolerance
- No documentation for rationale of prescribing choice

Results

Figure 2. Prescribing practices for VRE subcohort pre- and post- BP change



Conclusion

- Increasing the ampicillin BP for urinary enterococcus increased the rate of ampicillin susceptibility
- A corresponding increase in aminopenicillin prescriptions was identified, but remained low relative to the rates of ampicillin susceptibility
- Increasing the ampicillin BP may reduce unnecessary antibiotic exposure, however prescriber education is likely needed to facilitate appropriate use

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