Klebsiella aerogenes: Are there implications to taxonomic accuracy?

L. Nicholas Herrera MD
Matthew Brown, PharmD
W. Seth Edwards, PharmD
Sixto Leal MD, PhD
Joshua Stripling, MD
Rachael Lee, MD

UAB HEERSINK SCHOOL OF MEDICINE
The University of Alabama at Birmingham
VANDERBILT UNIVERSITY MEDICAL CENTER

Background

- With advances is genomics, microbiologists can accurately rename existing bacteria: examples include *Clostrioides difficile*, *Cutibacterium acnes*, and *Klebsiella aerogenes*.
- Due to differences in Ambler Class C (AmpC) beta-lactamase production, there are therapeutic differences between *Klebsiella aerogenes* and the more commonly seen *Klebsiella pneumoniae*
- In May 2018, UAB Hospital updated the change in nomenclature in the Electronic Medical Record (EMR) while maintaining the same selective susceptibility reporting for AmpC associated organisms
- We sought measure differences in therapeutic choices and patient outcomes ‘pre-’ and ‘post-’ this change.

Methods

- Population:
  - Monomicrobial *K. aerogenes* bacteremia from May 2016 to May 2020 from UAB
  - > 18 years old
- Exclusions:
  - Death within 48 hours of drawing blood cultures
  - Recurrences of bacteremia
- Recorded:
  - Patient demographics
  - Therapeutic details
    - Appropriate therapy was defined as an antibiotic with reported susceptibility with consideration of AmpC induction for a duration appropriate to clinical syndrome with minimum of 7 days
  - Microbiologic data
  - Recurrence rates and mortality
- Descriptive statistics were performed

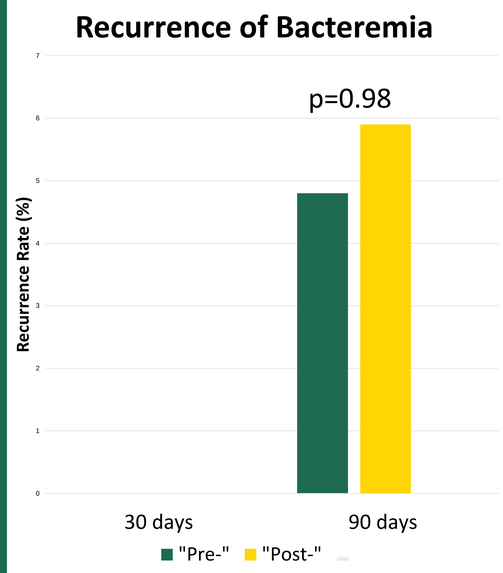
Selective susceptibility reporting and appropriate documentation in the EMR was not associated with increased morbidity and incorrect therapeutic decisions after microbiologic changes in nomenclature

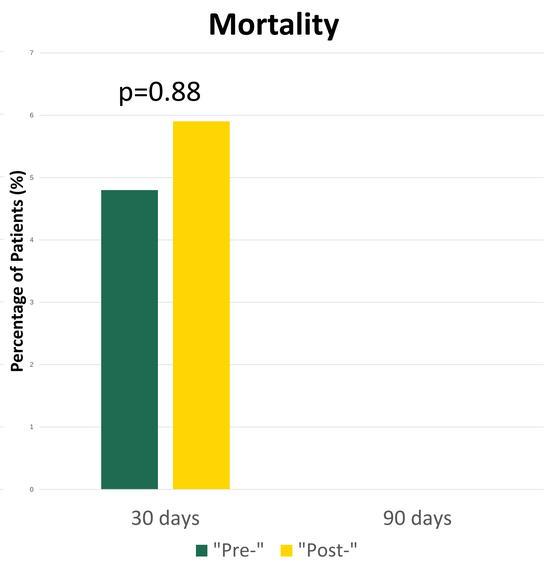
Results

	Total (n=38)	‘Pre-’ (n=21)	‘Post-’ (n=17)	
Age	57.1 ± 16.4	56.8 ± 16.4	57.4 ± 17.4	p=0.92
Male	30 (78.9%)	20 (95.2%)	10 (58.8%)	p=0.006
Source				p=0.09
GI	14 (36.8%)	9 (42.9%)	5 (29.4%)	
GU	9 (23.6%)	6 (28.5%)	3 (17.6%)	
Respiratory	8 (21%)	1 (4.8%)	7 (41.2%)	
Line	6 (15.8%)	4 (19%)	2 (11.8%)	
Soft Tissue	1 (2.6%)	1 (4.8%)	0 (0%)	

Table 1: Patient Demographics

- Similar race and comorbidities
- Similar rates in nosocomial acquisition and concomitant infection





Rates of Appropriate therapy

- “Pre-”: 95.2%
- “Post-”: 88.2%

p=.43

Antimicrobial Selection

- Cefepime: most chosen inpatient therapy
  - “Pre-”: 57.1%
  - “Post-” 64.7%
- Oral ciprofloxacin: most chosen outpatient therapy
  - “Pre-”: 57.1%
  - “Post-” 64.7%
- No use of ceftriaxone in either time-frame
- Similar rates of transition to oral therapy

Conclusions and Clinical Implications

- Care must be taken when taxonomic changes of clinically relevant bacteria may potentially affect optimization of antibiotics.
- As the ID consultants, we must be aware of these name changes and provide updated recommendations.
- This is a small single center retrospective study. Larger multi-center studies should be performed based on local approaches to determine clinical implications.
- Unable to prove causality between selective reporting and our findings