Fluoroquinolone prescribing for diabetic foot infections following an FDA Drug Safety Communication for aortic aneurysm risk

Catherine Li[1], PharmD; Nicholas Mercuro[1], PharmD; Ryan Chapin[1], PharmD; Howard Gold[2], MD; Christopher McCoy[1], PharmD

1. Department of Pharmacy 2. Silverman Institute for Health Care Quality and Safety
Beth Israel Deaconess Medical Center, Boston, MA

Contact: Catherine Li
Email: cli8@bidmc.harvard.edu

Background

- Fluoroquinolones (FQ) are treatment options for diabetic foot infections (DFI)[1,2]
- 69% of hospitalized patients received empiric ciprofloxacin for DFI at our institution from 2011-2014[3]
- On December 20, 2018, the U.S. Food and Drug Administration (FDA) released a Drug Safety Communication on FQ-associated risk of aortic aneurysm[4]

Objective

To assess the impact of the December 2018 FDA Drug Safety Communication on antibiotic prescribing for DFI in the absence of targeted Antimicrobial Stewardship program interventions

Methods

- Design: Single-center, quasi-experimental study

Inclusion criteria

ICD-10 Code
- E10.621 (Type 1 diabetes with foot ulcer)
- E11.621 (Type 2 diabetes with foot ulcer)

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Antibiotic ordered for DFI (intravenous or oral)
- Ciprofloxacin
- Levofloxacin
- Ceftriaxone
- Cefepime
- Ceftazidime
- Ampicillin/sulbactam
- Piperacillin/tazobactam

Exclusion criteria
- Concomitant infection(s)
- Documented BL or FQ allergy
- Antibiotics initiated at outside hospital
- Subsequent admissions during study period

- Outcomes
  - Primary: inpatient FQ days of therapy (DOT)
  - Inpatient beta-lactam (BL) and antipseudomonal beta-lactam (AntiPsA BL) DOT
  - Outpatient FQ and BL DOT on discharge
  - Resolution of infection at discharge (alive, T<100.3 F, and white blood cell count <12000 cells/mm^3)
  - Enrollment in Outpatient Parenteral Antimicrobial Therapy (OPAT)
  - 60-day outcomes: readmission for DFI, antibiotic adverse events, *C. difficile* infection, mortality
- Statistics
  - Sample size of 126 patients to detect a 25% reduction in FQ DOT with 80% power
  - Pearson's Chi Square, Fisher's Exact, and Mann Whitney U tests
  - Logistic regression for predictors of inpatient receipt of FQ

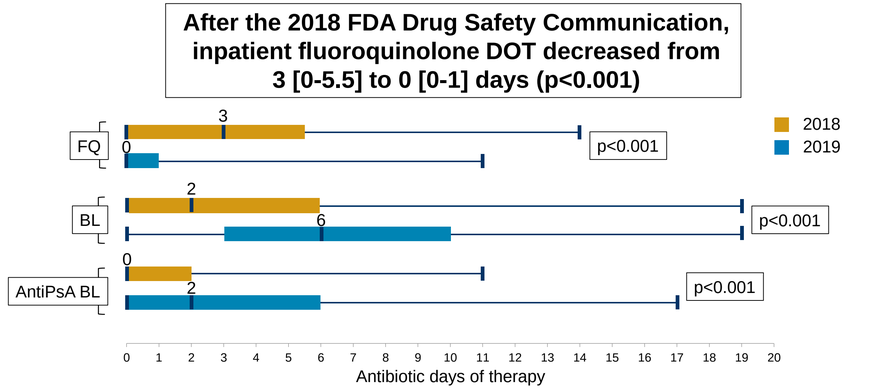
Results

Table 1: Baseline characteristics for 198 patients included in analysis

n (%)	2018 (n=97)	2019 (n=101)	p-value
Male	69 (71.1)	78 (77.2)	0.327
Age*	66 [59-73]	64 [56-74]	0.402
Hospital length of stay* (days)	7 [4-10.5]	7 [5-10.5]	0.351
AHRQ Elixhauser score*	-1 [-4-5]	0 [-4-8]	0.317
Hypertension	81 (83.5)	78 (77.2)	0.267
Peripheral vascular disease	47 (48.3)	48 (47.5)	0.896
PEDIS Grade 3	36 (37.1)	48 (47.5)	0.138
PEDIS Grade 4	11 (11.3)	12 (11.9)	0.905

*median [IQR] AHRQ = Agency for Healthcare Research and Quality PEDIS = Perfusion, Extent, Depth, Infection, Sensation

Figure 1: Inpatient antibiotic DOT



- No statistically significant differences observed in
  - Inpatient total antibiotic duration; DOT against MRSA, anaerobes
  - Outpatient total antibiotic duration; FQ/BL/AntiPsA BL DOT; DOT against MRSA, anaerobes

Figure 2: 60-day outcomes

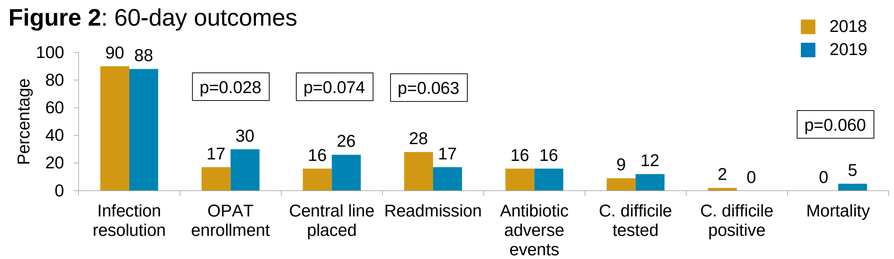
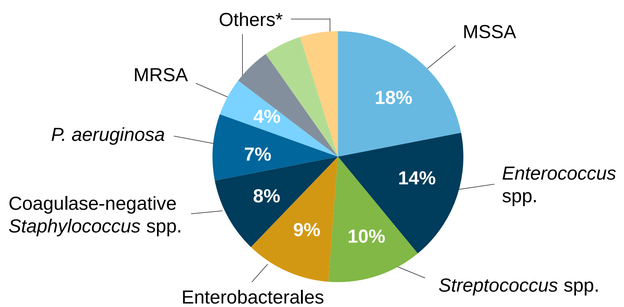


Figure 3: Microbiologic distribution of DFI from 100 cultures



* 4% *B. fragilis* 4% *Corynebacterium* spp. 4% *Prevotella* spp.

MSSA = methicillin-susceptible *S. aureus*
MRSA = methicillin-resistant *S. aureus*

Limitations

- Single-center, retrospective analysis
- Not powered to assess differences in clinical outcomes and adverse events

Conclusion

- FDA communications can impact decisions in antibiotic selection and transitions of care for hospitalized patients
- Antimicrobial stewardship programs can guide clinicians on the application of regulatory statements to practice

Disclosures

The authors have no disclosures concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

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