Out of sight, out of mind: Impact of an antimicrobial stewardship bundle on fluoroquinolone utilization

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BACKGROUND

Fluoroquinolones are associated with an ever-growing list of adverse events. As a result the Food and Drug Administration has warned against their use in uncomplicated infections.[1] Despite these warnings, 39% of fluoroquinolone usage may be unnecessary.[2] The Infectious Disease Society of America (IDSA) recommends antimicrobial stewardship initiatives as a means of optimizing antimicrobial usage.[3]

Suppression of antimicrobial susceptibility reports is one method of antimicrobial stewardship recommended by the IDSA.[3] Various studies have shown that differences in susceptibilities reported alter provider prescribing.[4-7]

In June 2017, Wesley Healthcare implemented an antimicrobial stewardship bundle to reduce fluoroquinolone usage.

PURPOSE AND DESIGN

Purpose: To determine the impact of an antimicrobial stewardship bundle on fluoroquinolone utilization.

Design: Single-center, retrospective, quasi-experimental interrupted time series analysis.

ANTIMICROBIAL STEWARDSHIP BUNDLE

- Suppression of ciprofloxacin susceptibility reporting in *Enterobacterales* isolates. Ciprofloxacin was suppressed unless one of the following apply:
  - Blood culture
  - Isolate is intermediate or resistant to ciprofloxacin
  - Resistance to multiple agents (excluding ampicillin and nitrofurantoin)
  - Organism is *Enterobacter* sp., *Citrobacter* sp., or *Serratia* sp.
- Removal of fluoroquinolones as first-line agents from order sets
- Respiratory specific antibiogram created

OUTCOMES

Primary Outcome:

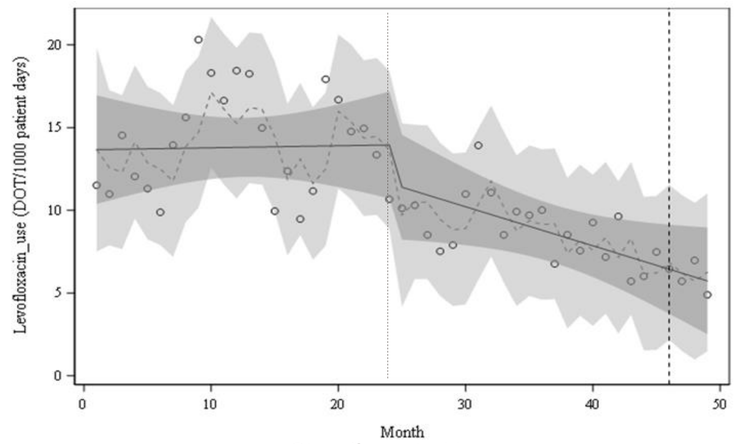
- Ciprofloxacin and levofloxacin usage in days of therapy (DOT) per 1,000 inpatient days
- Control: Overall antimicrobial usage in DOT per 1,000 inpatient days

Secondary Outcomes:

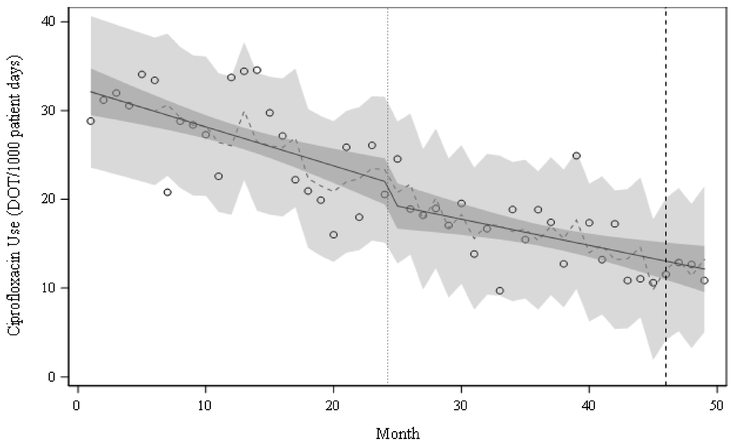
- *Pseudomonas aeruginosa* susceptibility to ciprofloxacin
- *Escherichia coli* susceptibility to ciprofloxacin

RESULTS

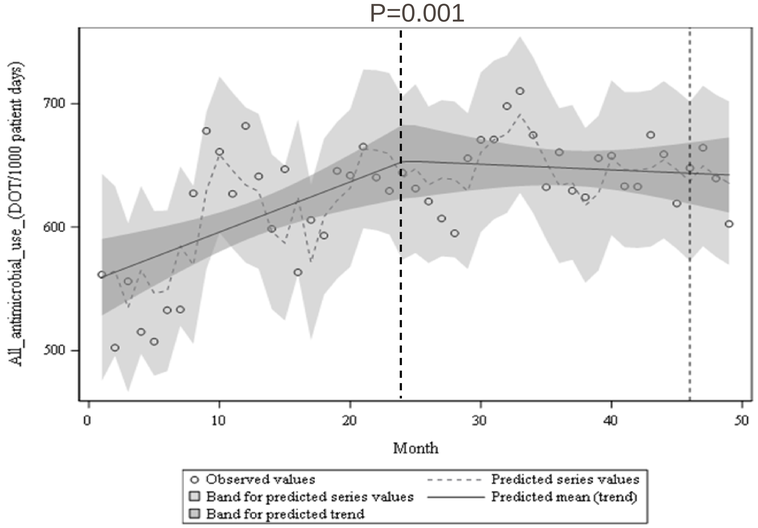
Levofloxacin Usage
P=0.035



Ciprofloxacin Usage
P=NS



All Antimicrobial Usage
P=0.001



Outcome	Pre-intervention mean (95% CI)	Post-intervention mean (95% CI)
Ciprofloxacin use (DOT/1,000 inpatient days)	26.9 (24.6 - 29.4)	15.8 (14.0 - 17.5)
Levofloxacin use (DOT/1,000 inpatient days)	14.1 (12.7 - 15.4)	8.4 (7.6 - 9.3)
Overall antibiotic usage (DOT/1,000 inpatient days)	604.1 (580.3 – 628.0)	646.7 (634.9 - 658.6)
***E. coli* susceptibility to ciprofloxacin (%)**	0.85 (0.84 - 0.86)	0.85 (0.84 - 0.86)
***P. aeruginosa* susceptibility to ciprofloxacin (%)**	0.84 (0.81 - 0.87)	0.84 (0.82 - 0.87)

CONCLUSION

The antimicrobial stewardship bundle, which included suppression of ciprofloxacin susceptibilities, removal of fluoroquinolones from order sets, and implementation of a respiratory specific antibiogram, was associated with reduction in ciprofloxacin and levofloxacin usage, as well as a reduction in the trend of levofloxacin usage. This study supports the implementation of similar bundles to reduce fluoroquinolone usage.

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Disclosures

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