Reduction of Overall and Inappropriate Antibiotic Prescribing within a Veterans Affairs Primary Care System through Peer Comparison of Overall Antibiotic Prescribing Rates

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Background

• Majority of antibiotic expenditures occur in the outpatient setting.1,2
• Increasing attention to outpatient antimicrobial stewardship: The National Action Plan for Combating Anti-Resistant Bacteria sets a goal of a 50% reduction in inappropriate outpatient antibiotic use by 2020.3
• Outpatient antibiotic overdose is prevalent nationally4 and in the VA Pittsburgh Healthcare System1
• More data are needed to inform stewardship efforts.4
• Little data exist on effect of stewardship interventions on non-antibiotic infections, or on giving feedback on overall antibiotic prescribing rates
• Ideal outpatient stewardship program
  – Low barrier to implementation
  – Easily gathered data
  – Ongoing and sustainable
  – Decreases inappropriate use
  – Increases guideline-concordance
  – Among respiratory and non-antibiotic tract infections

Objective

• Reduce inappropriate antibiotic prescribing rates in a primary care setting through initial education and email-based monthly peer comparison of overall antibiotic prescribing rates

Methods

• Baseline antibiotic prescribing data were collected6
• All primary care providers (PCPs) offered education
• Baseline data shared
• Guidelines for antibiotic prescribing for most common conditions discussed
• PCPs were emailed monthly comparisons of their antibiotic prescribing rate, peer prescribing rates, and a system target
• Intervention period of January – June 2016 compared to a seasonal baseline of the same months in 2016
• Random sample of prescriptions reviewed for adherence to consensus guidelines
• Excluded prescriptions with duration > 28 days
• Indication, agent selection, and duration reviewed
• Safety analysis: Identified patients with admissions or ED visits during which an antibiotic was given within 30 days of a PCP visit during which no antibiotic was prescribed
• Random subset reviewed to determine if antibiotic prescription at PCP visit could have prevented the admission/ED visit

Results

Seasonal baseline January – June 2016 vs. Intervention January – June 2017

- 65 PCPs caring for 40,774 patients
- 73 PCPs prescribing for 41,191 patients
- Educational sessions attended by 50/73 (68.5%) PCPs
- Baseline data shared
- 80% of reviewed prescriptions
- National trials (UK, Switzerland) with mixed results
- Substantial reduction in overall azithromycin and fluoroquinolone use

Figure 1. Reduction in total antibiotic prescriptions from baseline to intervention period

Figure 2. Reduction in the most common prescriptions from baseline to intervention period

Table 1. Likelihood that an antibiotic prescribed at a PCP visit could have prevented the subsequent ED visit or admission

Figure 3. Reduction in inappropriate antibiotic prescriptions from baseline to intervention period overall and for the most common conditions among a randomly reviewed subset

Figure 4. Total antibiotic prescriptions and prescribing appropriateness by month during baseline vs. intervention

Conclusions

Initial education followed by monthly peer comparison of overall antibiotic prescribing rates reduced overall and inappropriate antibiotic prescribing

• Substantial reduction in overall azithromycin and fluoroquinolone use
• When these drugs were prescribed after intervention, prescription was still very frequently inappropriate, highlighting these drugs as remaining targets for reduction in the outpatient setting
• Improvements in prescribing appropriateness were observed across the most common outpatient conditions, including non-respiratory infections
• No evidence of harm was identified from our intervention
• Practical approach with low barrier to implementation
• Substantial inappropriate prescribing persisted despite improvement

Overall vs. Inappropriate Prescribing

• Feedback based on inappropriate prescribing generally effective
• May be labor intensive for an antimicrobial stewardship program

Safety analysis: Identified

• Increasing attention to outpatient antimicrobial stewardship:
  – A review of resistance 
  – A study of antibiotic prescribing 
  – A report on antibiotic prescribing
• More data are needed to inform stewardship efforts.

Limitations

• Single Veterans Affairs Health System
  – Generalizability may be limited
• Appropriateness determinations assume accurate documentation
• No control group
• Cannot exclude Hawthorne effect or other factors contributing to decline in prescribing

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References