INTRODUCTION

• At least 30% of antibiotics prescribed in the outpatient setting are unnecessary 2

• Antibiotics are commonly overprescribed for upper respiratory tract infections (URIs) despite 90-98% being viral in nature 1

• Antibiotic stewardship interventions in the outpatient setting are necessary to reduce inappropriate antibiotic prescribing 4

• Antibiotic commitment posters represent a potential low-hanging fruit antibiotic stewardship initiative in the outpatient setting, especially for clinic systems with limited available antibiotic stewardship resources

• The Centers for Disease Control and Prevention advocate for display of commitment posters in outpatient clinics to advise providers to only prescribe antibiotics when a bacterial infection is suspected 6

• The impact of antibiotic commitment posters on antibiotic prescribing in the outpatient setting has largely been part of multi-faceted interventions in academic medical centers or urban cities rather than in rural outpatient settings

OBJECTIVE

• To determine the impact of antibiotic commitment posters as a single-intervention in rural outpatient clinics on antibiotic prescribing for URIs

METHODS

• Study Design: Quasi-experimental study

• Study Location: A network of outpatient clinics located in rural New York and Pennsylvania within The Guthrie Clinic system

• Inclusion criteria: Patients with a URI visit diagnosis code at outpatient clinics that had not yet implemented other antibiotic stewardship interventions

• Exclusion criteria: Patients with other outpatient infectious disease state diagnosis codes or at outpatient clinics with other antibiotic stewardship interventions implemented

• Pre-Intervention Period: July 1, 2016 – December 31, 2016

• Intervention Period: Antibiotic commitment posters were displayed in exam and waiting rooms of outpatient clinics between April–June 2017

• Post-Intervention Period: July 1, 2017 – December 31, 2017

• Data Collection: Demographic, provider, clinic-specific, and antibiotic prescription data were collected

• Data Analysis: Comparison of the number of URI visit diagnosis codes where an antibiotic was prescribed or not prescribed between the pre-intervention and post-intervention period after adjusting for covariates of interest.

• Statistical Analysis: All statistical analyses were performed using R Statistical Software (Foundation for Statistical Computing, Vienna, Austria) and the probability of prescribing antibiotics pre–versus post-intervention was compared using a generalized linear mixed-effects model

• Ethics: This study was approved by the Institutional Review Board at Binghamton University and The Guthrie Clinic.

IMPLEMENTATION & RESULTS

The Guthrie Clinic Antibiotic Commitment Poster

Dear Patient,

We promise to treat your illness in the best way possible. This commitment includes not prescribing antibiotics if they are likely to cause more harm than good.

Sincerely,

[Signature]

Table 1. Demographics

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total URI Cases</td>
<td>4424</td>
<td>4482</td>
</tr>
<tr>
<td>Antibiotics Prescribed for URI</td>
<td>2415 (54.6%)</td>
<td>1977 (51.6%)</td>
</tr>
<tr>
<td>Age (years)</td>
<td>41 (1-98)*</td>
<td>42 (4-98)*</td>
</tr>
<tr>
<td>Male</td>
<td>45%</td>
<td>34%</td>
</tr>
<tr>
<td>Visit Length (minutes)</td>
<td>20.0 (15.0; 20.0)**</td>
<td>20.0 (19.0; 20.0)**</td>
</tr>
<tr>
<td>Congestive Heart Failure</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Hypertension</td>
<td>27%</td>
<td>29%</td>
</tr>
</tbody>
</table>

Figure 2. Distribution of Proportions of URI Diagnoses with Prescribed Antibiotics over all Clinics by Year

Table 2. Factors Influencing Antibiotic Prescribing for URIs

<table>
<thead>
<tr>
<th>Factor</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older Age (&gt;65 years)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Males</td>
<td>0.005</td>
</tr>
<tr>
<td>Chronic Obstructive Pulmonary Disease</td>
<td>0.741</td>
</tr>
<tr>
<td>Congestive Heart Failure</td>
<td>0.279</td>
</tr>
<tr>
<td>Hypertension</td>
<td>0.98</td>
</tr>
<tr>
<td>Visit Length</td>
<td>0.218</td>
</tr>
<tr>
<td>Visit with their Primary Care Physician</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*From a generalized linear mixed-effects model

DISCUSSION

- To our knowledge, this is the first study to investigate the impact of antibiotic commitment posters on antibiotic prescribing in rural outpatient clinics
- Fewer antibiotics were prescribed for URI cases in the post-intervention period compared to pre-intervention (51.6% vs. 54.6%, respectively; adjusted odds-ratio for time period = 0.89 for 2017 vs. 2016, p = 0.013)
- The most commonly prescribed antibiotics in both cohorts were amoxicillin, azithromycin, clavulanate, and doxycycline
- Male gender (p=0.005), older age (p<0.001), and patients being seen by a provider other than their primary care provider (p=0.001) were associated with a higher proportion of antibiotics prescribed per URI diagnosis
- There was no statistically significant difference in antibiotics prescribed for patients with and without certain comorbidities such as diabetes, hypertension, or chronic obstructive pulmonary disease after accounting for other covariates
- Similar to our findings, Meeker and colleagues demonstrated that display of antibiotic commitment posters in exam rooms resulted in a 19.7 absolute percentage reduction in inappropriate antibiotic prescribing rate compared to the control group (p<0.02) and that this represents a simple, low-cost antibiotic stewardship intervention
- Antibiotic commitment posters are a simple antibiotic stewardship intervention to implement in the outpatient setting

Keys to Success:

- Physician Champion and Senior Director of Quality supported the use of antibiotic commitment posters in exam rooms to minimize inappropriate antibiotic prescribing in the outpatient setting
- All providers in the outpatient clinics signed the poster to demonstrate their commitment to appropriate antibiotic prescribing
- Pragmatic use of a really broad swath of URI diagnoses codes to account for practice variation in a rural setting

Limitations:

- All primary care clinics across the health system received the commitment posters, therefore there is no control
- Without a control clinic, the associated decrease in antibiotic prescribing rates could be due to factors in addition to the poster intervention
- Our results may not be generalizable to other outpatient clinic systems in different geographical locations

REFERENCES