



Evaluation of Antibiotic Prescribing Practices for Geriatric Patients in the Outpatient Setting in a Veterans Affairs Hospital: Identification of Stewardship Targets

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Background

- Implementation of antimicrobial stewardship programs (ASP) across the continuum of care is a national priority, with the goal of decreasing inappropriate prescribing in the outpatient setting by 50% by the year 2020.
- Data reflecting the misuse of antibiotics in the outpatient setting provides the justification for expanding ASPs into that healthcare setting. However, the best way to implement these interventions has not been properly elucidated.
- Deciding when and how to treat elderly patient's with antibiotics can be difficult due to factors such as atypical presentation of infections, drug interactions and comorbid conditions such as renal dysfunction
- Review of current antibiotic prescribing patterns for patients in the outpatient setting may help to identify stewardship targets as it relates to the outpatient setting

Objectives & Methods

- Objective:**
- Quality improvement study to evaluate the prescribing patterns of oral antibiotics for geriatric patients in the outpatient setting of the VA WNY Healthcare System
- Study Design:**
- Prospective cohort study of patients who received treatment with oral antibiotics in any outpatient setting, with retrospective chart review
 - Subjects identified at time of prescribing through alerts in the EMR
 - Study Period: June 1st to September 21st of 2017

Outcomes

- Primary Outcome:**
- Incidence of appropriate prescribing of antibiotics for patient's ≥65 years old as defined by relevant clinical practice guidelines
- Secondary Outcomes:**
- Incidence of appropriate prescribing in patients ≥65 years old compared those <65 years old
 - Retreatment or hospital admission for same indication at 30 days

Inclusion Criteria

- Patients with an outpatient prescription for the following antibiotics: amoxicillin, amoxicillin/clavulanate, azithromycin, cephalexin, cefpodoxime, cefdinir, clindamycin, ciprofloxacin, levofloxacin, moxifloxacin, sulfamethoxazole/trimethoprim

Exclusion Criteria

- Patients admitted to or discharged from the hospital
- Antibiotics used for post surgical or pre-dental prophylaxis
- Antibiotic prescriptions with insufficient documentation to assess therapeutic appropriateness
- Diagnosis made by a provider outside the VA WNY Healthcare System

Results

Baseline Characteristics

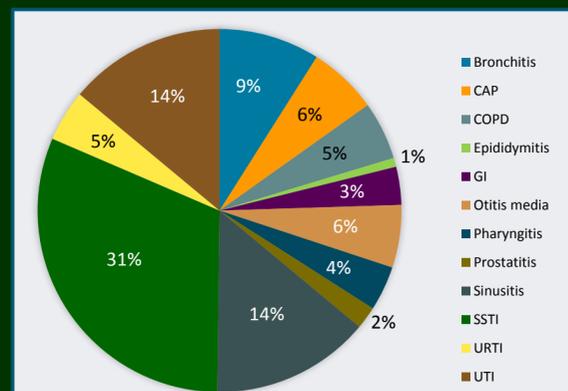
| Parameter | All patients (n = 1063) | Age < 65 (n = 518) | Age ≥ 65 (n = 545) | P-value |
|-------------------------------|-------------------------|--------------------|--------------------|---------|
| Age | 62.4 ± 15.8 | 49.8 ± 11.6 | 74.41 ± 8.0 | <0.0001 |
| Male | 955 (89.8) | 426 (82.2) | 529 (97.1) | <0.0001 |
| Weight | 95.8 ± 24.9 | 97.95 ± 26.0 | 93.7 ± 23.6 | 0.0057 |
| BMI | 31.0 ± 0.9 | 31.75 ± 8.0 | 30.21 ± 7.04 | 0.0010 |
| Serum creatinine | 1.08 ± 0.8 | 0.99 ± 0.65 | 1.18 ± 0.83 | 0.0004 |
| Creatinine clearance | 108.3 ± 48.0 | 132.2 ± 46.3 | 85.56 ± 37.3 | <0.0001 |
| Temperature | 97.8 ± 0.9 | 97.98 ± 0.89 | 97.7 ± 0.93 | <0.001 |
| COPD | 625 (58.8) | 67 (13.0) | 168 (30.9) | <0.0001 |
| Asthma | 75 (7.1) | 41 (7.9) | 34 (6.3) | 0.285 |
| MI | 66 (6.2) | 12 (2.3) | 54 (9.9) | <0.0001 |
| CHF | 62 (5.8) | 5 (1.0) | 57 (10.5) | <0.0001 |
| PVD | 153 (14.4) | 30 (5.8) | 123 (22.6) | <0.0001 |
| CVA/TIA | 65 (6.1) | 15 (2.9) | 50 (9.17) | <0.0001 |
| Dementia | 19 (1.8) | 0 (0) | 19 (3.5) | <0.0001 |
| Pulmonary disease | 306 (28.7) | 106 (20.5) | 200 (36.7) | <0.0001 |
| DM (no complications) | 125 (11.7) | 57 (11.0) | 68 (12.5) | 0.456 |
| DM w/complications | 168 (15.8) | 47 (9.1) | 121 (22.2) | <0.0001 |
| Moderate-Severe renal disease | 132 (12.4) | 23 (4.4) | 109 (20.0) | <0.0001 |
| Tumor w/o metastases | 212 (19.9) | 35 (6.8) | 177 (32.5) | <0.0001 |
| Metastatic solid tumor | 11 (1.0) | 1 (0.2) | 10 (1.8) | 0.0082 |
| Charlson Index | | | | |
| 0-4 | 926 (87.1) | 493 (95.2) | 433 (79.3) | <0.0001 |
| 5-10 | 137 (12.9) | 25 (4.8) | 112 (20.6) | |

Appropriate Treatment and Outcomes

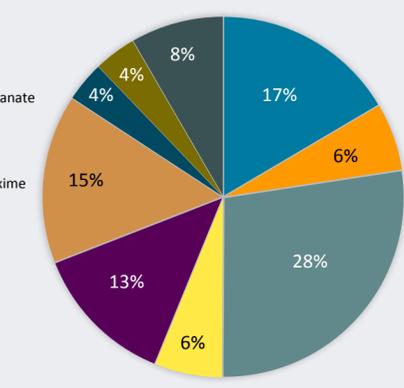
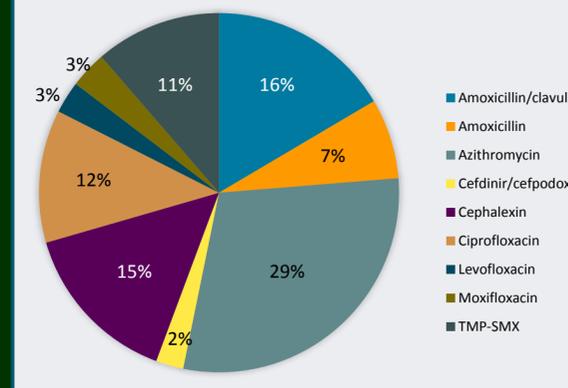
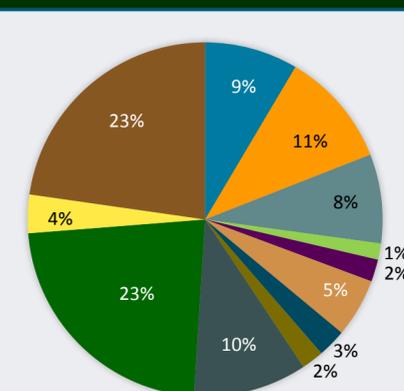
| Intervention | All patients (n = 1063) | Age < 65 (n = 518) | Age ≥ 65 (n = 545) | P-value |
|--------------------|-------------------------|--------------------|--------------------|---------|
| Correct drug | 554 (52.1) | 264 (51.0) | 290 (53.2) | 0.46 |
| Correct dose | 864 (81.3) | 445 (85.9) | 419 (76.9) | 0.0002 |
| Correct duration | 802 (75.4) | 385 (74.3) | 417 (76.5) | 0.41 |
| Antibiotic needed | 634 (59.6) | 323 (62.3) | 311 (57.1) | 0.078 |
| Retreat in 30 days | 122 (11.5) | 53 (10.2) | 69 (12.7) | 0.2143 |
| Admit in 30 days | 29 (2.7) | 10 (1.9) | 19 (3.5) | 0.1196 |

Infections Treated & Antibiotics Prescribed

< 65 years old



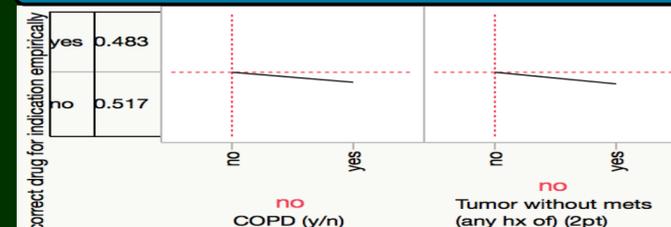
≥ 65 years old



Potential Stewardship Interventions

| Intervention | All patients (n = 1063) | Age < 65 (n = 518) | Age ≥ 65 (n = 545) |
|-------------------|-------------------------|--------------------|--------------------|
| Change antibiotic | 243 (22.9) | 122 (23.6) | 121 (22.2) |
| Change dose | 40 (3.8) | 13 (2.5) | 27 (5.0) |
| Change duration | 55 (5.2) | 26 (5.0) | 29 (5.3) |
| Obtain culture | 47 (4.4) | 26 (5.0) | 21 (3.9) |
| Perform imaging | 9 (0.85) | 4 (0.78) | 5 (0.92) |
| Discontinue | 405 (38.0) | 183 (35.3) | 222 (40.7) |

Logistic Regression



- Patients with COPD had a higher odds of being treated appropriately with antibiotics (OR 1.4, 95%CI: 1.03-1.9) compared to those without COPD
- Patients with a history of tumor without metastases were also more likely to be treated appropriately (OR 1.15 95%CI: 1.1-1.98)

Discussion

- While there are many reasons to be cautious when prescribing antibiotics in elder patients, age itself did not appear to be a risk factor for inappropriate prescribing
- Patients ≥65 years old were statistically significantly more likely to be prescribed an inappropriate dose of an antibiotic
- This data suggests that special care is warranted to ensure proper dosing of antibiotics in older patients, but a similar level of inappropriate prescribing occurs in all age groups
- We identified unnecessary use of azithromycin for respiratory tract infections and inappropriate use of ciprofloxacin for urinary tract infections and prostatitis as important stewardship targets for elderly patients

Conclusions

- Data suggests 40% of antibiotics were not indicated
- Patients >65 years old were more likely to receive an antibiotic at an inappropriate dose
- Older patients were not more likely to require retreatment or hospital admission at 30 days
- This study suggests that pharmacists could have an impact on outpatient antibiotic prescribing by recommending appropriate drug, dose, and durations at the point of care

Disclosures

- The authors of this presentation have no conflicts of interest to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation
- This research is the result of work supported with the use of resources and facilities at the VA Western New York Healthcare System
- This research project was approved by the VA Western New York Healthcare System R&D Committee
- The contents of this poster represent the work of the authors and are not intended to represent the views of the Department of Veterans Affairs or of the United States Government