

Assessing Antibiotic Prescriptions for Patients with Acute Exacerbation of Chronic Obstructive Pulmonary Disease



Vivien Cao, B.Sc.(Pharm); Michelle Hinch, B.Sc.(Pharm), PharmD; Cindy San, B.Sc.(Pharm), PharmD, ACPR; Victor Leung, MD, FRCPC; Tien Trong Nguyen, MDCM, FRCPC; Don Sin, MD, FRCPC, MPH

Background

- Acute exacerbation of COPD (AECOPD) is an acute worsening of respiratory symptoms where antibiotics are recommended if 2-3 cardinal symptoms are present^a
- St. Paul's Hospital (SPH) AECOPD pre-printed order (PPO) was updated in February 2015:
 - Simple AECOPD^a: cefuroxime
 - Complex AECOPD^b: amoxicillin/clavulanate or moxifloxacin
 - Pseudomonas suspected^c: ciprofloxacin or piperacillin/tazobactam

^aSimple: ≥2 cardinal symptoms (increased sputum, purulence, dyspnea)

^bComplex: simple + one of: FEV₁<50%, ≥4 exacerbations/year, ischemic heart disease, home O₂, chronic oral steroid

^cPseudomonas: complex + *Pseudomonas* isolated during previous AECOPD or colonized

Objective

- To describe prescriber adherence to PPO antibiotic recommendations
- Primary outcome:** proportion of antibiotics adherent to the PPO
- Secondary outcomes:**
 - Proportion of additional antibiotic use for coverage of atypical bacteria and MRSA
 - Proportion of oral antibiotics as compared to IV used as initial treatment
 - Median duration of antibiotic therapy
 - Proportion of patients with sputum cultures ordered
 - Proportion of patients with positive viral nasopharyngeal swabs

Methods

- Retrospective chart review of SPH medicine admissions between March 1, 2015 to March 1, 2017, with ICD-10 code for AECOPD
- Exclusion: admission to ICU; diagnosis of pneumonia based on imaging or physician documentation
- Descriptive statistics

Results

- 378 patients screened from ICD-10 code: 149 included in analysis

Median age ± IQR	66 ± 15 years	
Severity of exacerbation	Simple	47 (31%)
	Complex	99 (67%)
	Pseudomonas history	3 (2%)

Table 1. Baseline characteristics (n=149)

Primary outcome:

- Proportion of antibiotics adherent to PPO: 47% (n=70)

Secondary outcomes:

- Proportion of additional atypical coverage: 39% (n=58)
- Proportion of additional MRSA coverage: 1% (n=2)
- Proportion of oral antibiotic use as initial treatment: 58% (n=86)
- Median duration of antibiotics: 7 days (range 2-11)
- Proportion of patients with sputum cultures ordered 91% (n=134)
 - 15% (n=20) had positive sputum cultures
- Proportion of patients with viral swab ordered 63% (n=94)
 - 20% (n=19) had positive viral swab results

AECOPD severity	Total patients	Appropriate antibiotics	Inappropriate antibiotics
Simple	47	70%	30%
Complex	99	56%	44%
Pseudomonas	3	33%	67%

Table 2. Proportion of appropriate antibiotics prescribed, stratified by severity

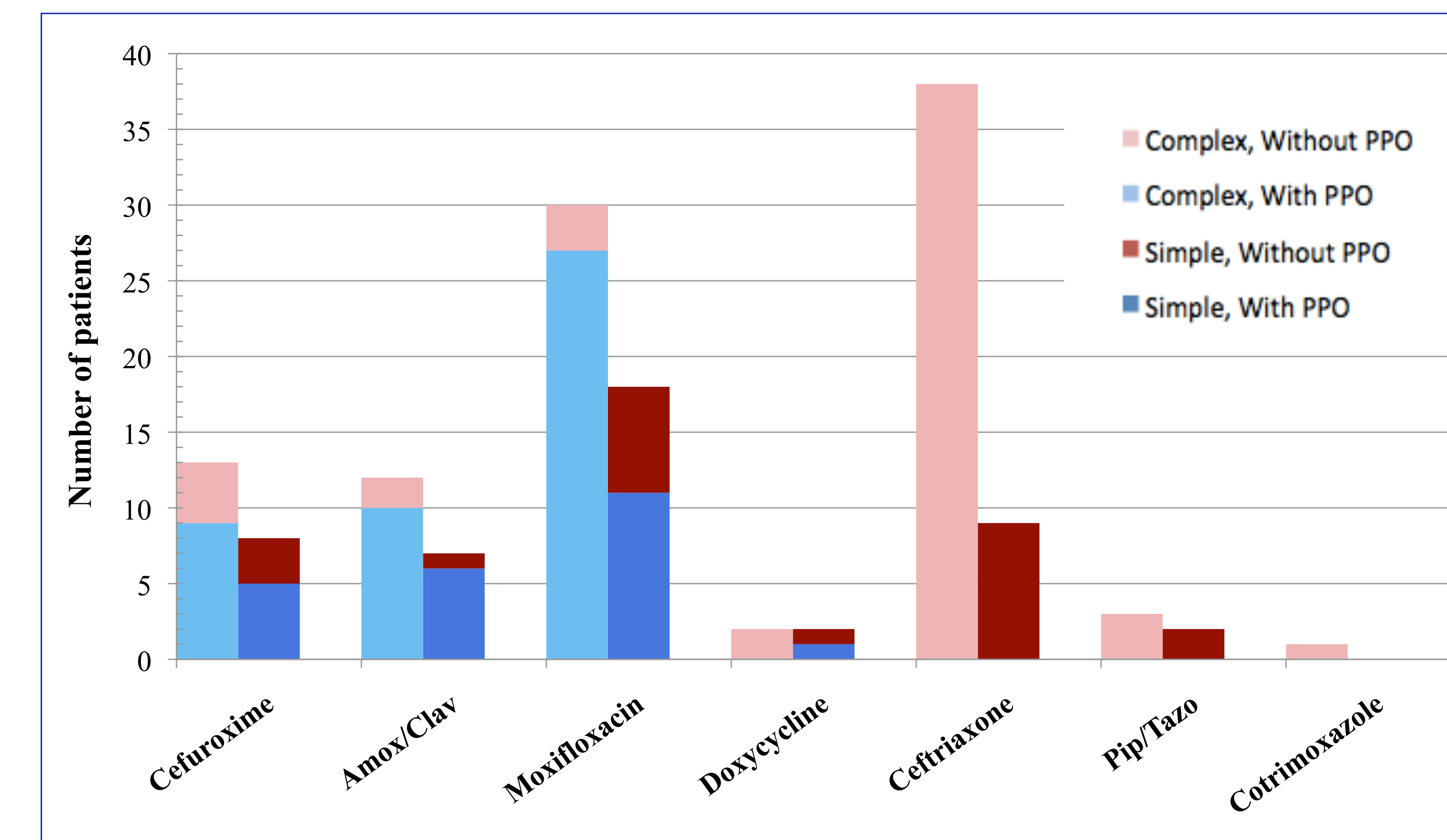


Fig. 1 Initial antibiotics prescribed stratified by PPO adherence and exacerbation severity

AECOPD severity	Proportion	
	IV	PO
Simple	30%	70%
Complex	46%	54%
Pseudomonas	67%	33%
Total	42%	58%

Table 3. IV vs PO antibiotics as initial treatment, stratified by severity

Conclusion

- Less than 50% adherence to AECOPD PPO antibiotics
- Additional coverage of atypical bacteria was prescribed frequently
- Additional MRSA coverage was rare
- Median duration of therapy was on the upper end of guideline-recommended range of 5-7 days
- Ceftriaxone was the most common antibiotic prescribed when the PPO was not used
- More information is needed to understand why prescribers do not adhere to the PPO