A Review of Inhaled Corticosteroid-Containing Agents and Tiotropium Prescribing Patterns for Chronic Obstructive Pulmonary Disease at Surrey Memorial Hospital

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Background

- Studies reviewing chronic obstructive pulmonary disease (COPD) prescribing patterns have found non-concordance between clinical practice and the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines, such as:
  - Underuse of bronchodilator therapy
  - Overuse of inhaled corticosteroid-containing agents (ICS)
- Concerns regarding the initiation of maintenance inhalers (e.g. ICS, tiotropium) on admission include:
  - Prescription based on a clinical diagnosis without confirmatory spirometry and/or appropriate follow-up
  - Compliance concerns due to the cost of inhalers in the community
  - Adverse effects, e.g. increased risk of pneumonia in COPD patients receiving ICS

Objectives

Purpose: To relate the current prescribing patterns of ICS and tiotropium at Surrey Memorial Hospital (SMH) to the GOLD 2019 guidelines to identify potential gaps in inpatient COPD management and provide recommendations to optimize therapy

Primary Objectives

To describe patients newly initiated on ICS and/or tiotropium for COPD management during hospital admission and characterize them into 4 groups:

- Documented spirometry confirming COPD diagnosis
- Documented pre-existing COPD history without spirometry confirmation
- New clinical COPD diagnosis during the index admission
- Prescribed inhalers for other reasons

Secondary Objectives

To describe guideline non-concordance based on the GOLD 2019 guidelines[1]

≥ 2 moderate exacerbations or ≥ 1 leading to hospitalization	**Group C** **LAMA**	**Group D** **LAMA *or* LAMA + LABA *or* ICS + LABA*** *Consider if eosinophils ≥ 300
0 or 1 moderate exacerbations (not leading to admission)	**Group A** **A Bronchodilator**	**Group B** **LAMA or LABA**
	mMRC 0-1 or CAT < 10	mMRC ≥ 2 or CAT ≥ 10

To describe guideline non-concordance using the proportion of:

- Guideline non-concordant ICS discontinued prior to discharge
- Guideline non-concordant tiotropium discontinued prior to discharge

To describe the estimated retail cost of all guideline non-concordant prescriptions

Methods

- **Design**: Retrospective chart review of patients newly prescribed ICS and/or tiotropium during admission at SMH from January 2019 to August 2019 inclusive
- **Inclusion Criteria**:
  - Adult patients ≥ 18 years of age
  - Received ICS and/or tiotropium during admission to SMH
- **Exclusion Criteria**:
  - Prescribed ICS in hospital and receiving any ICS prior to admission
  - Prescribed tiotropium in hospital and receiving any LAMA prior to admission
  - Documented diagnosis of asthma or asthma/COPD overlap
  - Discharged from hospital directly from critical care or surgical wards
- **Sample**: Convenience sample size of 100 patients selected in reverse chronological order from August 2019 for review

Table 1: Patient Characteristics (N=100)

Male, %	53
Age (years), median (IQR)	74 (15.2)
Smoking Status, %	
Current smoker	32
Former smoker	37
Non-smoker	19
Unclear/Not documented	12
Smoking History (pack-years), median (IQR)	42.5 (25)
GOLD Stage, %	
Stage 1	1
Stage 2	11
Stage 3	8
Stage 4	1
Unable to stage	58
Not applicable†	21
GOLD Group*, %	
Group A/B	59
Group B	5
Group C/D	6
Group D	9
Not applicable†	21
Patients with ≥ 1 prior exacerbation requiring hospitalization, %	13
Patients with previous inhaler trials, %	
SABA	53
SAMA	44
LAMA	5
Combination LAMA/LABA	7
Patients with previous spirometry, %	44
Patients with previous mMRC or CAT, %	14

mMRC = modified Medical Research Council Dyspnea Scale; CAT = COPD Assessment Test
* Unable to assess GOLD Groups A and C
† No suspected or documented COPD

Table 2: Details of Guideline Non-Concordant Inhalers

Proportion of patients prescribed tiotropium without a trial of a SABA or SAMA in GOLD Group A	Unable to assess
Proportion of patients prescribed ICS in GOLD Groups A, B, and C (n=49)*	93.9%
Proportion of patients prescribed ICS in GOLD Group D without a previous exacerbation on LAMA or LABA (n=9)	11.1%
Proportion of guideline non-concordant ICS prescriptions discontinued prior to discharge (n=79)	26.6%
Proportion of guideline non-concordant tiotropium prescriptions discontinued prior to discharge (n=5)†	60.0%
Estimated retail cost of all guideline non-concordant prescriptions during hospitalization	$9647

* Assessed 49 patients in GOLD Groups A and B; unable to determine patients in Group C
† The 5 guideline non-concordant tiotropium were those prescribed for other reasons

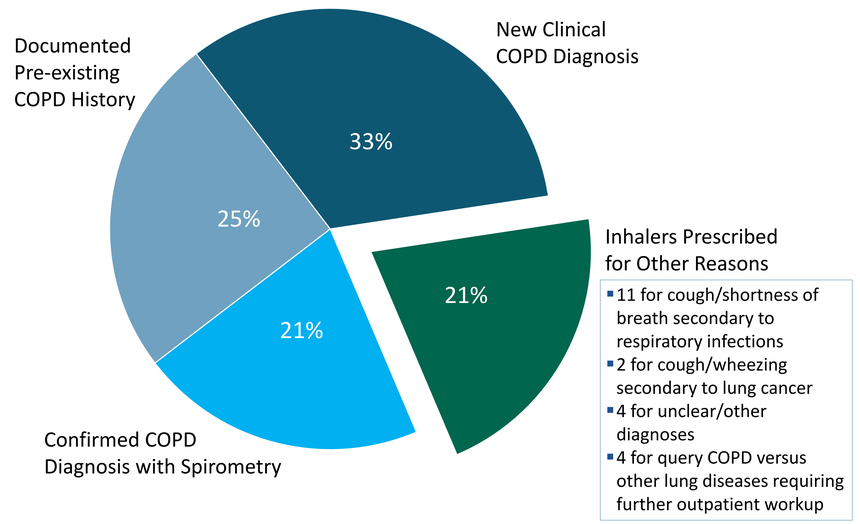

Figure 1: Characterization of Patients Newly Initiated on ICS and/or Tiotropium

Results

- Of the 21 patients who were prescribed inhalers for other reasons, all received an ICS (95% fluticasone/salmeterol, 5% fluticasone) and 24% received tiotropium
- 36% of patients with a new clinical COPD diagnosis were referred to outpatient services at discharge (e.g. Community Respiratory Services, pulmonary function testing, respirologist)

Limitations

- Retrospective design
- Unable to describe guideline non-concordance in GOLD Groups A and C as functional status scores (i.e. modified Medical Research Council Dyspnea Scale, COPD Assessment Test) were unavailable; these patients were instead classified as Group A/B or C/D
- Did not capture COPD exacerbations outside of Fraser Health, which could affect GOLD group classification and consequently whether therapy was guideline concordant
- Did not capture spirometry completed outside of Fraser Health, which could affect GOLD staging and characterization, i.e. confirmed COPD diagnosis with spirometry
- Medication reconciliation records only capture the 6 months prior to admission; previous inhaler trials may not have been fully summarized, and physician samples may not have been documented

Conclusions

- The majority of patients in GOLD groups A, B, and C were prescribed guideline non-concordant ICS, and only one-quarter of all guideline non-concordant ICS prescriptions were discontinued prior to discharge
- Consistent documentation (i.e. functional status scores, exacerbation history, spirometry) would improve the ability to group and/or stage patients with COPD, and facilitate the assessment of guideline concordance in research and clinical practice
- Recommendations for optimizing COPD management include increasing referrals to outpatient diagnostic and chronic management services, and reassessing all inhaled medications during admission and transitions of care

1. Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease [Internet]; 2019 [cited 2020 Jun 1]. Available from: http://wwwgoldcopdorg/.