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Guideline adherence in management of stable chronic obstructive pulmonary disease☆

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Summary
Background: Chronic obstructive pulmonary disease (COPD) is the only leading cause of death with rising morbidity and mortality. Clinical practice guidelines (CPGs) to optimize pharmacotherapy for patients with COPD have been updated based on promising results of randomized clinical trials. We examined the frequency of and factors associated with guideline adherence by physicians in clinical practice at an academic medical center.
Methods: Patients with a clinical diagnosis of COPD, confirmed by spirometry, who presented to the ambulatory clinics, were enrolled. The primary outcome was provider's adherence to the 2007 Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines. Subjects were categorized as guideline-concordant who received a rescue inhaler (all patients), or at least one long-acting bronchodilator (stage II), or at least one long-acting bronchodilator plus an inhaled corticosteroid (stage III–IV). Demographics, clinical information and type of provider were recorded. Provider type was classified as primary care physician (PCP), pulmonologist, or co-management by both.
Results: Among 450 subjects who met study criteria, 246 (54.7%) received guideline-concordant treatment. Age, sex, race, disease severity, and co-morbidities were not associated with guideline adherence. Multivariate analysis showed that patients co-managed by a PCP and pulmonologist had a higher likelihood of receiving guideline-concordant treatment than those managed by one or the other (Odds Ratio: 4.59; 95% Confidence Interval: 2.92, 7.22, $p < 0.001$).

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Conclusions: Just over half of stable COPD patients receive guideline-concordant care. Co-management by a PCP and pulmonologist increases the likelihood of receiving guideline-concordant inhaler therapy.

Introduction

Chronic obstructive pulmonary disease (COPD) is characterized by chronic inflammation and a slowly progressive persistent airflow obstruction.[1] COPD affects more than 5% of adults in the United States. Based on the most recent data, COPD is the 3rd most common cause of death[2] and the only leading cause of death with rising morbidity and mortality.[3,4]

High prevalence, complexity of clinical presentations, high mortality and morbidity,[5] and the substantial economic burden of COPD[6] prompt the need for clinical practice guidelines (CPGs) to further optimize its management. CPGs were developed to define standards of care and to focus efforts on improving quality.[7] Previous studies have demonstrated the impact of CPGs in improving the quality of care among patients with such conditions as community acquired pneumonia (CAP),[8,9] acute myocardial infarction,[10,11] and congestive heart failure (CHF).[12] Despite these, accumulating evidence in the literature suggests underutilization of pharmacotherapy in similar conditions.[13]

The first CPG for the diagnosis and management of patients with stable COPD was established more than a decade ago.[14] Since then, tremendous advances in pharmaceutical treatment for COPD[15–19] have improved the long-term prognosis and quality of life for COPD patients[15,20,21] while simultaneously lowering the overall cost of care.[19] The Global Initiative for Chronic Obstructive Lung Disease (GOLD) guideline[22] provides stage-based recommendations for optimized pharmacotherapy for stable COPD patients.

The impact of patients' adherence to pharmacotherapy on exacerbation, quality of life, and mortality has been studied.[23] In this study, we aimed to investigate clinicians' adherence to pharmacotherapy recommendations in patients with COPD seen at the ambulatory clinics of an academic medical center. We also examined factors associated with adherence to these guidelines.

Patients and methods

Study design and population

In a retrospective study, we reviewed the electronic medical records of all 1234 patients who had at least one visit to the University of Texas Medical Branch (UTMB) ambulatory clinics with a clinical diagnosis of COPD, between January 1, 2010 and December 31, 2010. Of these, spirometry data were available for 657 (52.4%) cases. We included all 450 (35.9%) patients who met the clinical diagnosis of COPD confirmed by spirometry, i.e., ratio of forced expiratory volume in 1 s (FEV_1) to forced vital capacity (FVC) < 0.70.[23,25] Patients in acute exacerbation were excluded from further analysis. The institutional review board approved the study protocol. Written informed consent was not required due to the nature of the study.

Variables

Demographic and access to healthcare

Age, sex and race (non-Hispanic white, black, other) were provided by patients during the clinical encounter. The patient's health insurance status (Medicare or other type of insurance) and type of healthcare provider were also recorded. Patients were categorized into three groups based on the type of provider: those seen by a primary care physician (PCP) only; those who had a regular PCP, but had at least one referral visit to a pulmonologist during the study period, 12 months before and after the date of spirometry (co-managed); and those seen by a pulmonologist for their COPD management. For the purpose of this study, an outpatient visit to an internist, family physician, or geriatrician established the presence of a PCP.

Clinical information

Body mass index (BMI, calculated as weight in kilograms divided by height in meters squared) and history of comorbid clinical conditions including hypertension (HTN) or other cardiovascular disease (coronary artery disease, CHF, ischemic or non-ischemic cardiomyopathy), diabetes mellitus, anxiety or depression, osteoporosis, or lung cancer were obtained. The number of comorbid conditions for each subject was calculated based on the number of above-mentioned clinical conditions. The type of inhalers prescribed within 90 days before and after the spirometry date was recorded for each patient.

All participants' spirometry data were reviewed. FEV_1, FEV_1 percent-predicted value, FVC, and FEV_1/FVC were recorded. Based on the GOLD criteria, severity of disease was categorized as mild, stage I ($FEV_1 \geq 80\%$), moderate, stage II ($50 \leq FEV_1 < 80\%$), severe, stage III ($30 \leq FEV_1 < 50\%$), or very severe, stage IV ($FEV_1 < 30\%$).

Exacerbation was defined as a worsening of symptoms or respiratory failure requiring a provider encounter (telephone, emergency room visit, office visit, or hospitalization) that resulted in a prescription of a steroid, antibiotic, or both. The number of exacerbations over 12 months before and after the time of spirometry was calculated.

Adherence to the guideline

The primary outcome was the provider's adherence to the 2007 GOLD guidelines[22] for the pharmacotherapeutic management of patients with stable COPD. Patients were categorized into guideline-concordant and guideline-discordant groups, based on the following criteria. According to the 2007 GOLD guidelines,[22] all stable COPD patients should have