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Review

Effect of Primary Care on Reducing Rates of Hospitalization Among Chronic Obstructive Pulmonary Disease Patients

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Abstract

The normal course of Chronic obstructive pulmonary disease (COPD) includes a progressive reduction in lung function, exacerbations that necessitate primary care intervention or hospital admission, a steady decline in quality of life, and a shorter life expectancy. COPD is one of the ambulatory or primary care-sensitive illnesses for which it is hypothesized that efficient primary care management will lower the probability of hospital admission. Long-acting beta-agonist and inhaler steroid combination therapy improves spirometric results and overall health while lowering the annual risk of COPD exacerbations. Use of two or more treatment modules based on models designed specifically for chronic care delivery in developed countries have proven successful in lowering hospitalizations as well. Access to other therapies, such as pulmonary rehabilitation, acute exacerbation evaluation programs, and community or hospital-based respiratory specialists, may also be important. The goal of interventions to lessen the prevalence of COPD in underserved areas has to focus on locally driven integrated solutions, such as media campaigns to raise awareness and persuade at-risk individuals to get tested, as well as training for primary care workers on the significance and advantages of earlier detection and effective operation of chronic obstructive pulmonary disease. Importantly, uptake of influenza vaccination has demonstrated a link with hospital admission rates at the practice level. Proposed solutions for lowering hospitalization and reducing exacerbations among patients with COPD include greater access to pulmonary rehabilitative care, more rigorous implementation of smoking cessation programs and availability of modern long-acting medications.

Keywords: *chronic obstructive pulmonary disease, primary care practice, hospitalization, quality of life*

Introduction

Globally, about 210 million people suffer from chronic obstructive pulmonary disease (COPD) (1). According to estimates from the World Health Organization, the number of deaths from COPD will rise by 30% over the next ten years, ranking as the third largest cause of death by 2030 (2). COPD's normal course includes a progressive reduction in lung function, exacerbations that necessitate primary care intervention or hospital admission, a steady decline in quality of life, and a shorter life expectancy (3). In order to increase quality of life, length of life, and decrease hospital admissions, the Department of Health for England has published a COPD national strategy (4)and a number of policies to enhance chronic condition management in primary care. The Quality and Outcomes Framework (QOF), for instance, introduced a "pay for performance" program that rewards general practices for determining (by registration on practice computer systems) and addressing (by accomplishing a number of evidence-based quality indicators) a multitude of lifelong conditions, including chronic obstructive pulmonary disease. As a result, for practically all practices, national data on registered prevalence and indicator achievement are available. In order to ensure that the public and private health systems are able to handle the challenge of real terms resource reductions, reducing needless hospital admissions will be essential. COPD is one of the ambulatory or primary care-sensitive illnesses for which it is hypothesized that efficient primary care management will lower the probability of hospital admission (5). There are weaker relationships with primary care access and supply parameters, while some population factors, particularly deprivation, are highly associated with primary care sensitive condition admission rates. The likelihood of hospital admission may be decreased by effective therapy of COPD. According to Godtfredsen *et al.*, there is a gradient in the risk ratio of hospital admission as smoking prevalence rises (6). Additionally, long-acting beta-agonist and inhaler steroid combination therapy improves spirometric results and overall health while lowering the annual risk of exacerbations of chronic obstructive pulmonary disease (7, 8). According to a comprehensive analysis, individuals with COPD who received treatments using two or more Chronic Care Model components had lower hospitalization rates (9).

Methodology

This study is based on a comprehensive literature search conducted on October 12, 2022 in the Medline and Cochrane databases, utilizing the medical topic headings (MeSH) and a combination of all available related terms, according to the database. To prevent missing any possible research, a manual search for publications was conducted through Google Scholar, using the reference lists of the previously listed papers as a starting point. We looked for valuable information in papers that discussed the information about the effect of primary care on reducing rates of hospitalization among chronic obstructive pulmonary disease patients. There were no restrictions on date, language, participant age, or type of publication.

Discussion

Health services must allocate resources where they will yield the highest return when facing financial constraints. Those looking to cut costs should focus on improving disease management in the community to decrease hospital admissions (10). Calderón-Larraaga *et al.* (11) observed the relationship between demographic and primary healthcare characteristics and hospital admissions for COPD and it brought attention to the factors that influence admission rates. Using data from more than 8000 clinics in England that provide care for more than 53 million patients, the authors have combined routinely collected data sources on an astounding scale. They note a striking range in admission rates, from 125 to 646 per 100,000 people, which calls for an explanation. Smoking rate and socioeconomic deprivation were, predictably, linked to increased prevalence and admission rates among demographic factors. Undetected COPD was also discovered to be a significant factor. It was required to forecast the expected prevalence rate using a mathematical model and to deduct the diagnosed prevalence as indicated by primary care illness registers in order to get the undetected occurrence. This strategy leads to a number of issues. In one study, 27% of persons on COPD registers did not match the spirometric criteria for chronic obstructive pulmonary disease, among other reasons why disease registers are unreliable (12). The mathematical model was also based on post-code deprivation, which may have overestimated deprivation in practice populations (13). There are numerous hypotheses as to why the undiagnosed prevalence might influence admission rates. For instance, undiagnosed patients are more likely to be refused admission-preventing measures. On the other hand, a high prevalence rate of undetected disease may simply represent a high burden of diseases brought on by elements like smoking and poverty; in this case,

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the estimated prevalence of undiscovered illness tells us nothing new. In connection to admission rates, Calderón-Larraaga *et al.* looked at indicators of the amount and quality of primary care. The ratio of general practitioners to practice nurses per 1000 patients was one measure of quantity. The availability of practice nurses was negatively associated with admission rates, which suggests that hiring more practice nurses could result in fewer admissions. Clearly, practice nurses in the United Kingdom handle the majority of regular COPD care. Griffiths *et al.* found that admissions for diabetes and COPD were inversely related to nurse supply but the opposite was true for admissions for COPD and asthma indicate that the relationship between practice nurse supply and admissions may be complex and disease specific (14). The simplicity of scheduling appointments with medical professionals was evaluated by Calderón-Larraaga *et al.* utilizing patient-reported data from each practice in England collected as part of the national general practitioner study (11). It is easy but premature to draw the conclusion that patients with an aggravation of COPD who can't get an appointment are more inclined to be admitted given the inverse association among admission rates and the capacity to get a consultation within two days. If the practice favors COPD exacerbations as a reason for a same-day appointment, if patients have telephone access to a health professional, or if patients have domestic stock of antimicrobials and corticosteroids with documented action plans, are other practice features that are also likely to be significant. Access to outside therapies, such as pulmonary rehabilitation, acute exacerbation evaluation programs, and community or hospital-based respiratory specialists, may also be important. (10) The provision of such services varies significantly across the UK, which could have an impact on admission rates (15). In addition, Calderón-Larraaga *et al.* looked at indicators of the caliber of clinical care for COPD. Quality markers performed poorly as predictors of admission rates when compared to general practitioner access and quantity markers. Only the uptake of the influenza vaccine was strongly associated to (lowering) admission rates, making the reported quality markers poor instruments for gauging complicated services. While these were not evaluated, there is certainly awareness about the disparity in service quality among practices for detecting COPD (appropriate medication usage, and referring to rehabilitation) (12, 16). It is unclear whether the proposed National Strategy for Chronic Obstructive Pulmonary Disease recommendations for timely, correct assessment and monitoring in primary care are linked to fewer admissions (17). As a result, poorer communities have a higher incidence of COPD admission, and these rates are influenced by the standard and amount of primary care services. In most countries reducing health disparities has been and is still a governmental objective. In the United Kingdom, measures have been taken to address the poor health of the public, and the top 20% of primary care trusts with the lowest health outcomes (such as life expectancy) have been classified as "spearhead" health clusters (10). Techniques have been created to map the issue and its root causes, as well as to execute targeted programs to enhance treatment outcomes for conditions like chronic obstructive pulmonary disease (18). Admittedly, it is simpler to map out the issue than to resolve it. Interventions to lessen the prevalence of COPD in underserved areas have looked at locally driven integrated solutions, such as media campaigns to raise awareness and persuade at-risk individuals to get tested, as well as training for primary care workers on the significance and advantages of earlier detection and effective operation of chronic obstructive pulmonary disease. Practices have been encouraged to brace by being shown how their performance variables relate to that of other practices in an effort to eliminate variation among practices. Monetary benefits have also been implemented for better services, such high-quality spirometry. While there is a lack of concrete proof, it does seem that using a stick and carrot approach has helped some patients with chronic obstructive pulmonary disease. Improved detection rates have been demonstrated in case studies like the St Health primary care commissioning group, where the percentage of patients deemed to be receiving guideline-based management has increased significantly from 32% to 85%. When contrasted to nearby practices, admission rates have increased by 2.3%, while declining by 9.2% (18). It is obvious that care must be used when assessing admission rate changes before and after an intervention because they are subject to bias. Despite its limits, this kind of information will have an impact on groups of general practitioners who will supply their own facilities in the new environment created by the most recent National Health Services changes in the United Kingdom (10). Primary care service and patient characteristics may have an impact on the best management of COPD in underprivileged communities. The qualities of the population it serves and the efficacy of the profession, however, are inextricably linked. Patient experience studies are employed as a gauge of practice performance, however they rely on consent from the patients. The results in deprived communities may be impacted by a

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variety of factors, including reading comprehension. Implementing preventative health strategies, such as earlier detection by spirometry, smoking cessation, vaccination (19), and rehabilitative care (20), is hindered by a lack of patient engagement. Balanced lifestyles and maintenance treatment are poorly followed (21). In order to effectively serve underserved populations, primary care clinicians must overcome numerous obstacles, such as an increased proportion of chronic obstructive pulmonary disease, a large number of undetected patients, difficulties in gaining and complying to effective therapies, and high hospitalization costs. Additionally, these patients have high-risk behaviors like smoking, eating poorly, and not exercising. As a result, they are more likely to develop a variety of chronic illnesses, including as overweight, diabetes, ischemic heart disease, mental illness, and alcohol and other drug abuse, and they place an increasing strain on the healthcare system (22). Deprivation in practice populations is consequently linked to lower Quality and Outcomes Framework scores (23-25), poorer clinical achievements in Quality and Outcomes Framework (26, 27), and poorer outcomes in the patient experience survey, which results in lower general practitioner payments than the national average. In contrast to general practitioners in wealthy areas, those in impoverished communities have lesser general practitioners, lesser practice nurses, a greater workload for chronic obstructive pulmonary disease, and lower economic advantages. Calderón-Larraaga *et al.* have demonstrated this (28). There hasn't been much progress since Tudor Hart said in 1971 that the requirement for the community addressed appears to fluctuate inversely with the accessibility of effective medical treatment. These studies underscore the disparity between developed nations like the United Kingdom and developing regions like African nations, making the problems of developed countries seem insignificant on a larger scale. In Africa's underprivileged communities, where the confluence of smoking, poverty, tuberculosis, and the human immunodeficiency virus (HIV) is causing a significant crisis of lung illness, COPD is unquestionably the unacknowledged harbinger of death (26). By 2025, HIV-related deaths in Africa will be outnumbered by those caused by chronic lung illnesses (27). The health sectors across the globe need to ensure that resources are redistributed based on demand so as to tackle the rising challenge of COPD in underdeveloped regions.

Conclusion

Only indicator of the Quality and Outcomes Framework for COPD, which measures the uptake of influenza vaccination, has demonstrated a link with hospital admission rates at the practice level. The remaining Quality and Outcomes Framework measures for COPD include evaluation of clinical practices and requirements that are less probable to have an impact on results. Alternatively, solutions that have a greater chance of influencing results should be taken into account. For example, practitioners should be encouraged to offer patients with chronic obstructive lung disease more rigorous tobacco cessation assistance. The standard of after-hours care, the availability of specialty nursing care, and the quantity and caliber of hospital services are the remaining variables that may have an influence on hospitalizations.

Disclosure

Conflict of interest

There is no conflict of interest

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Ethical consideration

Non applicable

Data availability

Data that support the findings of this study are embedded within the manuscript.

Author contribution

All authors contributed to conceptualizing, data drafting, collection and final writing of the manuscript.

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