

Prevalence and Characteristics of Patients with a Diagnosis of Chronic Obstructive Pulmonary Disease Participating in Non-Pulmonary Rehabilitation Programmes: A Brief Report

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ABSTRACT

Purpose: To determine the prevalence of people with a diagnosis of chronic obstructive pulmonary disease (COPD) among those completing non-pulmonary rehabilitation (NPR) programmes and to describe their characteristics. **Methods:** Electronic data of participants who completed an in-patient rehabilitation programme between July 1, 2010, and July 1, 2012 were retrospectively reviewed. Data extracted were month and year of birth, sex, height, weight, referral source, admission and discharge dates, programme admitted to, reason for admission, most responsible health condition, number of co-morbidities, referral agency on discharge, and Functional Independence Measure (FIM) scores on admission and discharge. **Results:** The prevalence of COPD among participants who completed the NPR programmes was 7.5%. The most common reasons for admission were cardiac conditions ($n = 69$, 20%), followed by post-unilateral hip replacement ($n = 40$, 11%) and post-unilateral hip fracture ($n = 38$, 11%). Patients were discharged after an average stay of 20 (SD 13) days. The mean FIM score was 91 (SD 11) at admission and 108 (SD 9) at discharge. **Conclusions:** The prevalence of a COPD diagnosis among participants in NPR programmes was 7.5%. COPD is a common comorbidity for people in rehabilitation programmes who have had amputations, have a cardiac condition, have undergone organ transplantation, or require complex care.

Key Words: chronic obstructive pulmonary disease; prevalence; rehabilitation.

RÉSUMÉ

Objectif : Établir la prévalence des personnes atteintes d'une MPOC chez celles qui effectuent un programme de réadaptation non pulmonaire et décrire leurs caractéristiques. **Méthodes :** Examen rétrospectif de données informatisées au sujet de participants hospitalisés ayant terminé un programme de réadaptation entre le 1^{er} juillet 2010 et le 1^{er} juillet 2012. Les données extraites étaient les suivantes: mois et année de naissance, sexe, grandeur, poids, source de référence, date d'admission et date du congé, programme effectué, raison de l'admission, problème de santé principal, nombre de comorbidités, agence d'aiguillage au moment du congé, note de la mesure d'indépendance fonctionnelle (MIF) à l'admission et au moment du congé. **Résultats :** La prévalence de MPOC chez les participants ayant terminé un programme de réadaptation non pulmonaire était de 7,5%. La raison la plus fréquente de l'admission était un trouble cardiaque ($n = 69$, 20%), suivi d'une arthroplastie unilatérale de la hanche ($n = 40$, 11%) et d'une fracture unilatérale à la hanche ($n = 38$, 11%). Les patients ont obtenu leur congé après un séjour moyen de 20 (13) jours. La note moyenne de la MIF était de 91 (ET 11) à l'admission et de 108 (9) au moment du congé. **Conclusions :** La prévalence de MPOC chez les participants à un programme de réadaptation non pulmonaire était de 7,5%. La MPOC est une comorbidité fréquente dans les programmes de réadaptation destinés aux personnes qui ont subi une amputation ou une greffe d'organe, qui sont aux prises avec un trouble cardiaque ou qui exigent des soins complexes.

Chronic obstructive pulmonary disease (COPD) is a major public health concern and a leading cause of morbidity and mortality worldwide;¹ it affects some 210 million people,¹ or approximately 10% of the general adult population.²

Patients with COPD enrolled in pulmonary rehabilitation (PR) programmes often have multiple morbidities, such as cardiac, metabolic, and arthritic conditions.^{3,4} It is also recognized that patients who present with chronic conditions such as heart disease often have COPD as a

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secondary diagnosis.⁵ As has been demonstrated in the management of other chronic diseases such as diabetes,⁶ the potential to influence outcomes of care exists when patients are in hospital for conditions other than their primary illness. Given the issues of access to PR in the community,^{7,8} as well as the need to build capacity and improve quality of care within the health care system, it is important to consider that people enrolled in rehabilitation for conditions other than COPD may benefit from some aspects of PR while participating in non-pulmonary rehabilitation (NPR). However, little information is available on the prevalence of COPD among people enrolled in NPR. The objectives of our study, therefore, were to determine the prevalence of patients with a diagnosis of COPD among those completing NPR programmes and to describe their characteristics.

METHODS

Ethics approval was obtained from the hospital's research ethics board. Our data-collection process involved retrospectively reviewing electronic data obtained through the Canadian National Rehabilitation Reporting System (NRS) for all patients who completed an in-patient rehabilitation programme at St. John's Rehab programme of Sunnybrook Health Sciences Centre between July 1, 2010, and July 1, 2012. These programmes are geared toward people who have undergone amputations, burn injuries, or major trauma or who have cardiac, musculoskeletal, or neurological conditions, including stroke. There are also programmes for people who have undergone organ transplantation, require complex care, or have a diagnosis of cancer. No pulmonary rehabilitation or education regarding living with COPD is offered at this site.

We extracted the following data about patients from the medical records: month and year of birth, sex, height, weight, referral source, admission and discharge dates, reason for admission, most responsible health condition, number of co-morbidities, type of programme admitted to and discharged to, and Functional Independence Measure (FIM) scores on admission and discharge.

To determine a diagnosis of COPD, we used the International Classification of Diseases, 10th Revision, Canada (ICD-10-CA), an international classification for clinical diagnosis developed by the World Health Organization. We identified the codes J42 (unspecified chronic bronchitis), J43 (emphysema), J44.0 (COPD with acute lower respiratory infection), J44.1 (COPD with acute exacerbation), J44.8 (COPD, other), and J44.9 (COPD, unspecified), which had been entered based on patients' clinical history and not on spirometry data.

RESULTS

Of the 4,709 records we identified for analysis, 351 included a diagnosis of COPD based on the codes described above. Thus, the prevalence of COPD among patients

Table 1 Characteristics of Patients with a Diagnosis of COPD ($n = 351$)

Characteristic	Mean (SD)*
Sex, no. (%)	
F	175 (49.9)
M	176 (50.1)
Age, y	76 (10)
BMI, kg/m ²	26.5 (6.7)
FIM score	
Admission	91 (11)
Discharge	108 (9)

*Unless otherwise indicated.

FIM = Functional Independence Measure.

participating in NPR programmes was 7.5%. Patient characteristics are described in Table 1.

The prevalence of COPD varied by programme area: 14% in the Amputee and Complex Care programmes, 11% in the Transplant and Cardiac programmes, 7% in the Oncology programme, 6% in the Musculoskeletal programme, 5% in the Neurology and Stroke programme, and 2% in the Trauma and Burns programmes. Patients with a diagnosis of COPD were discharged after a mean stay of 20 (SD 13) days with a mean FIM score of 108 (SD 9) (not totally independent).

The most common reasons for admission to the rehabilitation facility were cardiac conditions ($n = 69$, 20%), post-unilateral hip replacement ($n = 40$, 11%), post-unilateral hip fracture ($n = 38$, 11%), post-unilateral knee replacement ($n = 36$, 10%), debility ($n = 29$, 8%), respiratory disorders ($n = 22$, 6%), circulatory disorders ($n = 19$, 5%), single amputation below the knee ($n = 13$, 4%), and stroke ($n = 10$, 3%). The most common health conditions of the 22 patients admitted due to respiratory disorders were infectious exacerbations of their COPD, status post-lung transplantation, or "other disorders of the lung." Four patients (1%) had one comorbidity in addition to COPD, 41 patients (12%) had two to four comorbidities, and 306 patients (87%) presented with five or more comorbidities.

Most of the patients with COPD (98%) were referred from the in-patient units of acute-care hospitals. On completion of the rehabilitation programme, almost half (46%) were referred to a facility-based ambulatory care service for follow-up; 38% were referred to either a home care agency or primary care services. Only 12% did not require a referral or transfer on discharge.

DISCUSSION

Of all participants in in-patient NPR programmes at the study site, 7.5% had a diagnosis of COPD. To our knowledge, this is the first study to investigate the prevalence of patients with COPD participating in NPR.

The prevalence of COPD in our cohort was slightly lower than the 9.3% and 10.1% prevalences reported by

two previous studies^{2,9} that included individuals from primary care⁹ and the general adult population.² Although differences in prevalence among countries are expected,^{2,10} the accuracy of COPD diagnosis in our study may have been influenced by the fact that the clinical information we collected was entered by health professionals mostly on the basis of patient-reported diagnoses. Clinical diagnoses—and, more specifically, patient-reported diagnoses—are known to underestimate disease prevalence.¹⁰ The two earlier studies^{2,9} used spirometry to confirm COPD, which may provide more accurate estimates.

In our study population, COPD was more prevalent in programmes for people who have had amputations (14%), who require complex care (14%), who have undergone organ transplantation (11%), or who had a cardiac condition (11%). The higher prevalence in the Amputee programme may be explained by the co-morbidities common to people with COPD and amputations, such as metabolic conditions (e.g. diabetes). The Complex Care programme admits patients who may have had a recent infectious exacerbation of their respiratory disease, thus accounting for the higher prevalence of patients with COPD in this programme. The higher prevalence of patients with COPD in the Cardiac programme could be due to common risk factors such as age and history of smoking. Finally, COPD is a common reason for lung transplantation, which explains the high prevalence of this diagnosis in the Transplant programme.

The options for PR in the population in which COPD is a secondary diagnosis are limited. Because most patients are transferred to the rehabilitation programmes from acute care, the introduction of aerobic exercise training may be difficult to implement in cases where musculoskeletal or neurological conditions affect participation. However, adapted modes of aerobic exercise, such as the use of an arm ergometer, should be considered for this population. Other components of PR, such as disease-specific education and strategies for self-management, have been shown to be effective in increasing knowledge¹¹ and decreasing hospitalizations and emergency visits.¹² There is a potential for these components of PR to be implemented in NPR programmes.

Given that 46% of patients were referred to a facility-based ambulatory care service for follow-up after NPR, the post-acute care maintenance phase may be a good time to accurately identify patients with COPD and manage their condition. Awareness of the presence of COPD as a comorbid condition could result in quality-improvement initiatives and disease-specific interventions such as medication optimization, smoking cessation, or referral to a PR programme.

Our study has several limitations: the data were gathered retrospectively in a single institution, lacked spirometric confirmation of COPD, lacked a detailed smoking history, and included only in-patients, as no electronic data were available for outpatients. However,

we suspect that these factors resulted in an under-diagnosis of COPD and that the prevalence we observed in in-patients would be equally applicable to outpatients.

CONCLUSION

The prevalence of patients with a diagnosis of COPD participating in NPR was 7.5%. COPD is a common co-morbidity in rehabilitation programmes for people who have had amputations, have a cardiac condition, have undergone organ transplantation, or require complex care.

KEY MESSAGES

What is already known on this topic

Chronic obstructive pulmonary disease (COPD) detrimentally affects the lives of patients and their families and also places a significant burden on health care resources. Pulmonary rehabilitation (PR) is essential to the management of COPD. Patients with COPD enrolled in PR often have multiple morbidities, such as cardiac, metabolic, and arthritic conditions, and patients presenting with chronic conditions such as heart disease often have COPD as a secondary diagnosis. Patients with COPD who are enrolled in non-pulmonary rehabilitation (NPR) for other conditions may benefit from some aspects of PR. Little information is available regarding the prevalence of COPD in populations enrolled in NPR.

What this study adds

This study gives an indication of the prevalence of COPD in populations enrolled in NPR and describes their characteristics. This information may be used as the basis for exploring the possibility of introducing disease-specific interventions to patients with COPD in NPR settings.

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