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Impact of Pulmonary Rehabilitation Stewardship Program on COPD Patients, Quality Improvement Project

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Abstract

Background: Pulmonary rehabilitation (PR) has multiple benefits in COPD patients. There are multiple barriers to utilize PR including lack of knowledge about the benefits of PR by providers.

Objective: We are conducting a Quality Improvement project to improve the referral rate of patients hospitalized for acute exacerbation of COPD to PR.

Methods: All patients admitted with a primary diagnosis of acute exacerbation of COPD requiring systemic steroids to Rochester General Hospital in the period between 7/1/2019 and 7/31/2019 were reviewed retrospectively. Between 7/15/2020 and 11/15/2020, we started a PR stewardship program, where we daily review patients hospitalized with acute COPD exacerbation, and then a note will be placed in the chart for the primary team to consider referring patients to PR upon discharge, patients' charts were reviewed after discharge. The rate of referral before and after the intervention was compared.

Results: During the pre-intervention period, 16 patients (mean age 67.7) with confirmed COPD by spirometry were hospitalized for COPD exacerbation, among them only 2 were referred to PR upon discharge (12.5%). During the post intervention period, 16 patients (mean age 65.0) were admitted with acute COPD exacerbation, among them 10 were referred to PR upon discharge (62.5%) [50% difference (16.5%–71%, 95% CI), P value = 0.004].

Conclusion: In our QI improvement project, we conclude that having a PR stewardship program to review patients hospitalized with COPD exacerbation significantly improves the referral rate to PR, and might help to improve utilization of those programs by patients who need them.

Keywords: COPD, Pulmonary rehabilitation

1. Introduction

In the medical field, stewardship traditionally refers to Anti-Microbial Stewardship established to prevent anti-microbial resistance in hospitals. We postulated that a Pulmonary Rehabilitation Stewardship (PRS) program would increase referrals to Pulmonary Rehabilitation (PR) for patients admitted with Acute Exacerbation of Chronic Obstructive Pulmonary Disease (AE-COPD). Chronic Obstructive Pulmonary Disease (COPD) affects 15.7 million Americans and is the third

leading cause of death in the US based on a 2015 CDC report.¹ Since then, the number of patients with COPD is likely to have increased. The burden of COPD is significant with data showing 15.4 million physician visits, 1.5 million emergency department visits and 726,000 hospitalizations.² Within 5 years of a hospitalization for COPD, the 5 year mortality rate is 55% and the 30 day readmission rate due to COPD exacerbation is 22.6%.^{3,4} At Rochester General Hospital, the readmission rate for COPD exacerbation is 21.2%.⁵ Pulmonary Rehabilitation is known to improve quality of life

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and reduce the frequency of exacerbations.⁶ We describe our pilot project below.

2. Methods

Rochester Regional Health Institutional Review Board approved our quality improvement project (IRB: 1978). Informed consent was waived and researchers analyzed only de-identified data. We conducted this pilot project between 7/2019 and 11/2020 at Rochester General Hospital. We included patients aged >40 years, with COPD defined by FEV1 < 80% and FEV1/FVC < 0.7 admitted to the hospital for COPD exacerbations requiring systemic steroids. We excluded patients <40 years of age, pregnant women and patients without pulmonary function tests (PFTs) on file. The pre-intervention group comprised of patients admitted in the period between 7/1/2019 and 7/31/2019 with primary diagnosis of AE-COPD. The investigators compiled data including demographics, PFTs, co-morbidities and pulmonary rehabilitation referral. From 7/15/2020 until 11/15/2020, we started a PRS program and carried out our intervention. Post intervention period was longer as COVID19 pandemic affected the number of COPD admissions. The investigators reviewed patients hospitalized with primary diagnosis of AE-COPD requiring daily systemic steroids who met the inclusion criteria. The intervention consisted of leaving a note in the chart recommending PR upon discharge with references to supporting literature^{6,7} for educational purposes. The investigators further reviewed these patients' charts after discharge as the post intervention group. The rate of PR referral before and after the intervention was compared using the Chi square test.

3. Results

The pre-intervention group consisted of 23 patients of which 7 patients were excluded as they didn't have spirometry data available for review. 16 patients (12 Female, mean age 67.7 years) had COPD confirmed by spirometry and 2 patients (12.5%) were referred to PR at time of discharge from the hospital. The post intervention group consisted of 21 patients, 5 patients were excluded as they didn't have spirometry data available for review. 16 patients (14 Female, mean age 65.0) had COPD confirmed by spirometry and 10 patients (62.5%) were referred to PR at time of discharge. We found that the referral rate to PR improved from 12.5% in the pre-intervention group to 62.5% in the

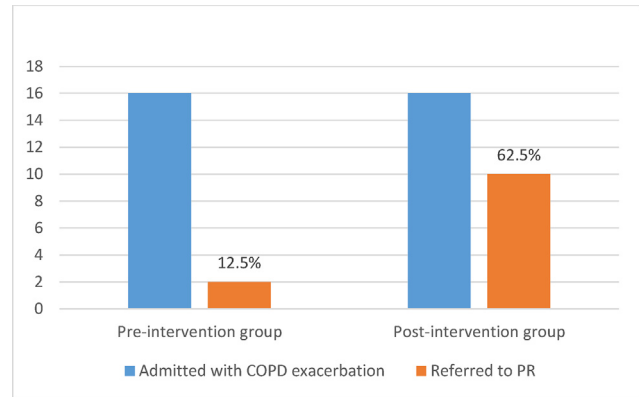


Fig. 1. A comparison between the referral rates to PR between the pre- and post-intervention groups.

post-intervention group [50% difference (16.5%–71%, 95% CI), P value = 0.004] (Fig. 1).

4. Discussion

Our pilot study shows that a PRS Program has the potential to significantly increase the referral rate to PR at time of discharge from the hospital for patients admitted with AE-COPD who meet the spirometry definition of COPD and criteria for PR referral. The clinical implications of PR are improvement of quality of life and reduction in the frequency of exacerbations in patients with COPD.⁶ Recent literature has also shown that initiation of pulmonary rehabilitation (PR) within 90 days of a hospital admission was significantly associated with a better 1-year survival rate.⁷ Barriers identified relating to referral to PR include lack of knowledge of PR for COPD, lack of knowledge of the referral process, actual or anticipated access difficulties for patients and questioning the need to do more to promote exercise behavior change.⁸ Other barriers include; lack of knowledge about the benefit of PR by the hospitalists, lack of knowledge about the benefits by the patients, patients' compliance and cooperation with program, affordability of transportation for patients, and insurance coverage. In our institution, the low referral rate in the pre-intervention group was likely due to unawareness of the benefits of PR and lack of knowledge of the referral process. Our study addressed 2 of these barriers by provider education (medical literature references that show benefit of PR) and guiding providers to utilize the PR order set which auto-generated a referral to the PR center and scheduled the patient for follow up. This likely increased the referral rate in the post-intervention group. The Centers of Medicare and Medicaid Services established a Hospital Readmissions Reduction

Program in 2012 to reduce avoidable readmissions and linking payment to the quality of hospital care.⁹ 30-day COPD readmission rate is one of the quality measures in the program. The establishment of a formal PRS program would be beneficial to health-care systems as reduction in the frequency of exacerbations would translate to lower readmission rates and a higher reimbursement. A major limitation of this study is the small sample size. A larger sample size would have provided more power to the study, but we had enough patients to detect a statistically significant difference between the two groups. Other limitations include the difference between the pre and post intervention durations as COVID19 pandemic affected the number of admissions due to AE-COPD, and most of the patients being female which seems to be by chance. This is a pilot project with future research aimed at studying a larger sample size, continuing our efforts to improve provider education and understanding PR access difficulties to patients with COPD. In conclusion, a Pulmonary Rehabilitation Stewardship Program increases the rate of referral to PR on discharge for patients admitted for AE-COPD.

Authors' contribution

All authors contributed substantially to this quality improvement design, data collection, analysis, interpretation, writing and revision of the manuscript.

Conflict of interest

None of the authors have any conflicts of interest to declare.

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