International Journal of Pharmaceutical Development & Technology

www.ijpdt.com

e ISSN - 2248 - 910X
Print ISSN - 2248 - 9096

INTERVENTIONS TO IMPROVE EDUCATION AND HOW STEROIDS ARE PRESCRIBED TO COPD PATIENTS

Maneesha M*, Farheen Sulthana MD, Nunavath Mounika, Mohammad Neha Afreen, Nishitha J

KLR Pharmacy College, Paloncha, Bhadradri Kothgudadm, Telangana- 507115, India.

ABSTRACT

With the growing prevalence of chronic obstructive pulmonary disease (COPD) and its associated exacerbations, hospital admissions have been increasing and economic impact has been significant. Low dose oral corticosteroids are recommended for treating exacerbations of COPD. The use of systemic corticosteroids in these cases is not adequately reflected in less than 50% of physicians' prescribing practices. Researchers examined the impact of pharmacist-led education interventions on COPD patients with exacerbations treated with systemic corticosteroids. In this retrospective case-control study, patients with COPD exacerbations were treated with systemic corticosteroids in an inpatient family medicine service. Prescribers were provided with pharmacy-led education interventions on systemic corticosteroids for COPD exacerbations. Patients who were retrospectively identified over a three-month period were retrospectively analysed prior to and following an educational intervention. During and after the educational sessions, chart reviews were conducted to evaluate prescribing practices. An educational intervention was also evaluated for its effects on length of stay, adverse events, and treatment costs. There were 25 participants before and 20 participants after intervention. The pharmacist-led interventions did not increase prescriber adherence to guidelines compared to pre-intervention patients. Since guideline adherence did not change statistically significantly, secondary outcomes were not affected. Pharmacist-led didactic education or dissemination of guidelines do not improve systemic corticosteroids in COPD exacerbations.

Keywords: Pulmonary Disease, Copd, Systemic Corticosteroids.

INTRODUCTION

[1] COPD is the fourth most prevalent disease in the United States. The prevalence of COPD and its symptoms may reach 24 million Americans according to a national health survey.COPD was estimated to affect 11.2 million adults in 2002. Moreover, as COPD prevalence increases, hospital admissions for exacerbations and costs associated with COPD may also increase [1,2]. Nationally and internationally, task forces have been created to establish consensus statements and guidelines for standardizing diagnosis and treatment so that the quality of care for these patients can be improved. To treat COPD exacerbations, current clinical guidelines recommend oral systemic glucocorticoids for two weeks at a low dose [3-6]. A safe and effective dose of oral prednisone for 7-10 days is recommended by the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines for managing COPD exacerbations [7]. Although low-dose oral steroids are considered effective in treating COPD exacerbations in the literature, prescribers are not following the guidelines consistently. Health care providers can therefore become more aware of clinical guidelines and ensure that evidence-based medicine is practiced by educating them about them.

Patients' outcomes can be improved and standardization can be achieved using evidence-based clinical guidelines. Evidence-based recommendations are implemented through such guidelines, and patients benefit [10]. According to a study by Grol and colleagues, 67% of physicians follow published clinical guidelines [11]. Specifically, only 48.8% of patients follow published clinical guidelines when making clinical decisions with COPD [11]. The pathophysiology of an exacerbation makes it difficult to identify patients who might benefit from systemic corticosteroids, so low-dose steroids are recommended to manage the symptoms. Because maximum improvement is seen after five days of treatment with low-dose steroids, it is recommended to use them for a shorter period of time [7-9].

By reducing hyperglycemia-related treatment needs, reducing secondary infections, and not significantly affecting outcomes at two weeks, low-dose steroids are healthier than high-dose steroids [3, 12].

Corresponding Author: - **Maneesha M** Email: - marakalamaneesha2000@gmail.com

The results of a previous study conducted by Self and colleagues revealed that clinical pharmacists can provide effective practice education to medical professionals to lower the cost of steroid therapy in exacerbations of COPD. This type of education has been proven to be an effective method of practitioner training [13]. Researchers in this study found that by using this kind of educational technique, physicians were more compliant with published clinical guidelines for managing COPD exacerbations, which is consistent with literature that describes its positive effect on clinical pharmacist-led prescriber education [14]. It was primary objective of a pharmacist-led education intervention to improve prescribing practices for systemic corticosteroids and compliance with clinical guidelines.

METHODS

Population, Setting, and Design

During and after an inpatient family medicine teaching service at an academic medical center, a retrospective chart review was conducted in two parts by a pharmacist who led educational interventions. Patients treated with systemic corticosteroids for COPD exacerbation at the family medicine clinic before and after the education intervention were included in the study (January-March 2021 and January-March 2022). If the patient was under 18 years old, in the intensive care unit, or not receiving systemic corticosteroids, they were excluded.

Study Procedures

For inclusion, patients with exacerbations of COPD were identified using code 496.0 of the International Classification of Diseases. Patients' demographic factors (gender, age, ethnicity), corticosteroid use (route, dose, duration, frequency), hospitalization adverse reactions, length and fees (Elevated WBC count, hyperglycaemia). The first dose of steroids was administered on the floor to both groups after admission to the emergency department (ED). If a dose was administered in the emergency department without the permission of the primary admitting team, it was not identified as the first dose due to the fact that steroid dosing was not decided by the primary admitting team. In both the morning report and the noon conference on the 8th and 9th of January 2022, attending and resident physicians received educational sessions. It was conducted by the same pharmacist for each session, with an emphasis on prescribing systemic corticosteroids to treat COPD exacerbations. It was the aim of the sessions to provide visual aids through power point presentations, handouts, guidelines and supporting literature for future reference, and an in-depth question-and-answer session to stimulate discussion among physicians on the subject matter. During each session, attending and resident physicians received informational pocket cards that included steroid conversion charts and guideline recommendations for exacerbation management (Table 1). Medical residents and attending physicians attended more than half of each session in the practice. Both sessions were attended by some physicians. To reinforce the key points presented in the presentations, the pharmacist also administered corticosteroids to patients with COPD exacerbations. An appropriate corticosteroid treatment was considered provided if the patient received less than or equal to 40 mg of oral prednisone daily, excluding the possibility that they had received higher doses or intravenous corticosteroids in an emergency room. When doctors prescribed intravenous and oral steroids at different doses during a hospital stay, the patient's initial dose and route determined whether they adhered to guideline recommendations. For the primary outcome to be measured effectively, Corticosteroids were prescribed for each study participant. Whether the steroid was continued or discontinued following discharge was determined by physician documentation in the discharge summary and/or medication reconciliation record. In addition to evaluating the effectiveness of the educational intervention on patient outcomes, our study assessed the impact on length of stay (LOS), adverse events, and treatment costs. In order to calculate LOS for each patient, admission and discharge dates were tracked. Increased glucose levels averaging over 150 mg/dL and elevated WBC values were detected as the patient's course of corticosteroid therapy progressed. The total hospital costs associated with steroid use during the patient's hospitalization were compared between the pre- and postintervention groups to determine the cost of treatment. Patients admitted for COPD exacerbations treated by students, residents, and faculty on rounds following intervention.

Outcomes

Prescription practices were assessed to determine whether they adhered to recommendations from current clinical guidelines for administering systemic therapy.

Data Analysis

Pre- and post-intervention adherence rates to guidelines were compared using Pearson Chi-Square and Fisher's Exact tests. In all statistical analyses, the significance level was .05. The findings of patient outcomes were measured by independent-measures t-tests. Non-parametric Mann-Whitney U tests were used when violations of normality or homogeneity of variance were detected.

RESULTS

The pre-intervention cohort consisted of 25 patients, while the post-intervention cohort consisted of 20 patients. Among the pre- and post-intervention groups, demographic data were not significantly different (Table 2). Pre- and post-intervention reporting in terms of guideline adherence did not show any significant differences, chi-square (n=20), p=0.216. In post-intervention mean values, there was no significant difference between pre-intervention and post-intervention

(M=3.19, SD=2.87 versus M=2.83, SD=1.01; p=0.066). In addition, post-intervention dollar costs were not significantly lower (M=10.78, SD=14.18 vs. M=8.52, SD=8.7; p=0.79). After the intervention, WBC was not significantly higher than pre-intervention (M=5.04, SD=1.78 vs. M=5.73, SD=2.53; p=0.321). It was observed that glucose levels failed to change significantly over the course of the intervention (M=83, SD=38.9 vs. M=76.7, SD=27.11, p=0.533).

Table 1: In medical conferences, physicians are given quick facts pocket cards about corticosteroid conversion and COPD exacerbation management

Drugs	Equivalent dose (mg)	Ai potency
Hydrocortisone	21	2
Cortisone	26	0.7
Prednisone	4	3
Prednisolone	6	3
Methylprednisolone	5	6
Triamcinolone	3	6
Betamethasone	0.5	25-40
Dexamethasone	0.77	32
Fludrocortisone	3	12

Table 2: Patient demographic data

	Pre-intervention	Post-intervention
Gender		
Male	10(35%)	8 (32%)
Female	15 (65%)	12 (68%)
Age in year		
More than 60	18 (80 %)	12 (68%)
Less than 60	7 (20%)	8 (32%)

DISCUSSION

Educators are defined in this study as individuals who communicate clinical information to physicians, primarily through pharmacist educators, so they can modify their practice performance.[14]. This study uses an educational intervention defined in the same way as previous studies [14]. According to Davis, et al., a systematic review evaluated patient outcomes and physician performance using different medical education methods [14]. The authors of this study support the role of educational interventions by other health care professionals in improving health care efficiency. For optimal patient outcomes, pharmacy and physicians need to collaborate interdisciplinarity according to a number of studies[12-15]. Certain pharmacist-led interventions, however, appear to have better results in changing prescription practices than others. Passive didactic lectures and guideline dissemination, as well as printed or electronic feedback to prescribers, have been shown to be less effective by Grindrod and colleagues. In addition to point-of-care reminders, educational outreach visits and patient-centered strategies, regular reminders should also be provided.[15]Educational outreach, auditing, and feedback have proven to be effective in other studies Keeping in mind that different interventions may also be effective depending on the prescribing problem that needs to be addressed. One approach may not work for every issue in every setting. Considering the aforementioned data, targeting interventional educational sessions to prescribers who do not adhere to national guidelines is critical. However, low adherence continues to be a problem, despite recent updates to the GOLD recommendations, including physicians' insufficient knowledge of the guidelines and literature associated with them. This study demonstrated that pharmacist-led educational sessions with didactic interventions and pocket card distribution did not significantly increase adherence to published guidelines. It seems that based on these findings either the wrong kind of intervention was employed to improve prescribing practices in line with GOLD guidelines, or the pharmacists were not able to devote adequate time to physician education due to a lack of manpower.

Some of the data collected during January 2022 were collected before the final educational session, which is a limitation of the study. This may have resulted in some post-educational data being collected before. Data collection was limited by chart documentation because this was a retrospective study. Additionally, it is important to note that no other aspects of adherence were investigated, such as bronchodilator use, oxygen use, antibiotic use, or severity of COPD, but only the appropriate dose, route, and duration of treatment as described in the guidelines. In addition to the patient's past medical history (diabetes) or insulin initiation, a low level of secondary outcome assessment might have been possible by including the patient's past medical history. A small number of patients in the study made it difficult to analyze pre- and post-intervention data collected at three-month intervals.

Due to the same ranking in the primary outcome, there was no correlation between the secondary outcomes and the increase in adherence to guidelines. The secondary cost analysis showed a negligible value, however some aspects of actual savings were not evaluated, especially nursing time, IV versus PO drug administration, and drug waste. Additionally, patients were documented as having received their first dose via a prescription from the primary team at the time of admission rather than in the ED itself. A significant number of patients presenting to the ED with a COPD exacerbation received intravenous 125 mg methylprednisolone, suggesting future educational interventions should target ED physicians and resident doctors. In addition, this finding suggests that pharmacists should be more present in the ED as a means of educating, practicing, and caring for patients.

This study educated physicians on how to make better decisions and follow guidelines by using a lecture-based, didactic format, pocket cards, and literature reviews. Physician education through various teaching methods and patient-specific interventions may be more effective in improving prescribing practices in this setting. Because pharmacists play an integral role in clinic rounding, pharmacists can be more proactive in pointing out national guidelines to physicians at study facilities.

A good form of physician education can assist physicians in adhering to guidelines, which should also improve patient outcomes, according to the literature that informed the GOLD recommendations. To improve compliance with published guidelines and evidence-based medicine, pharmacists will need to use different methods of information dissemination as part of their clinical practice.

CONCLUSIONS

Guidelines on the use of systemic corticosteroids in COPD exacerbations managed by pharmacists did not result in a change in prescribing practices.

REFERENCES

1. Centers for Disease Control. Facts about chronic obstructive pulmonary disease.
2. Strassels SA, Smith DH, Sullivan SD, Mahajan PS, *et al*. The costs of treating COPD in the United States. *Chest*. 119, 2001, 344-352.
3. Davies L, Angus RM, Calverley A, *et al*. Oral corticosteroids in patients admitted to hospital with exacerbations of chronic obstructive pulmonary disease: a prospective randomized controlled trial. *Lancet*. 354, 1999, 456-460.
4. Niewoehner DE, Erbland ML, Deupree RH, Collins D, Gross NJ, Light RW, Anderson P, Morgan N. Effect of systemic glucocorticoids on exacerbations of chronic obstructive pulmonary disease. *N Engl J Med*. 340, 1999, 1941-1947.
5. Tashkin DP. Oral vs IV corticosteroids for in-hospital treatment of COPD exacerbations. Chest. 132, 2007, 1728-1729.
6. de Jong YP, Uil SM, Grotjohan HP, Postma DS, Kerstjens HAM, van den Berg JWK. Oral or IV prednisolone in the treatment of COPD exacerbations: A randomized, controlled, double-blind study. Chest. 132, 2007, 1741-1747.
7. Global stategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease (GOLD). Executive Summary. Updated 2007.
8. Siafakas NM, Vermeire P, Pride NB, Paoletti P, Gibson J, Howard P, Yernault JC, Decramer M, Higenbottam T, Postma DS, Rees J, *et al*. Optimal assessment and management of chronic obstructive pulmonary disease (COPD). ERS- Consensus statement. Eur Respir J. 8, 1995, 1398-1420.
9. Celli BR, MacNee W, Agusti A, Anzueto A, Berg B, Buist AS, Calverley PMA, Chavannes N, Dillard T, Fahy B, Fein A, Heffner J, Lareau S, Meek P, Martinez F, McNicholas W, Muris J, Austegard E, Pauwels R, Rennard S, Rossi A, Siafakas N, Tiep B, Vestbo J, Wouters E, ZuWallack R, *et al*. Standards for the diagnosis and treatment of patients with COPD: a summary of the ATS/ERS position paper. *Eur Respir* J. 23, 2004, 932-946.
10. Davis DA, Taylor-Vaisey A. Translating guidelines into practice: A systematic review of theoretic concepts, practical experience and research evidence in the adoption of clinical practice guidelines. *Can Med Assoc J*. 157, 1997, 408-416.
11. Grol R. Successes and failures in the implementation of evidence-based guidelines for clinical practice. *Med Care*. 39(8), 2001, II-46-II-54.
12. Rodriguez-Roisin R. COPD exacerbations-5: Management. Thorax. 61, 2006, 535-544.
13. Self TH, Smith SL, Boswell RL, Miller WA, *et al*. Medical education provided by a clinical pharmacist: Impact on the use and cost of corticosteroid therapy in chronic obstructive pulmonary disease. *Drug Intell Clin Pharm*. 16, 1982, 443-447.
14. Bista D, Saha A, Mishra P, Palaian S, Shankar PR, *et al*. Impact of an educational intervention on the pattern and incidence of potential drug-drug interactions in Nepal. *Pharm Pract (Granada)*. 7(4), 2009, 242-247.
15. Davis DA, Thomson MA, Oxman AD, Haynes RB, *et al.* Changing Physician Performance: A Systematic Review of the Effect of Medical Education Strategies. JAMA. 274(9), 1995, 700-705.