Original article

Level of Adherence to the Gold Strategy Document for the Management of Patients with Acute Exacerbation of COPD in Sahiwal

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ABSTRACT

Background: Chronic Obstructive Pulmonary Disease (COPD) and its exacerbation are a major cause of pulmonology OPD and emergency visits in Pakistan. The objective of this study was to measure the level of adherence to the GOLD (Global Initiative for Chronic Obstructive Lung Disease) strategy document in the management of patients with acute exacerbation of COPD, in Sahiwal Punjab Pakistan.

Methodology: This retrospective cross-sectional study comprised 480 patients with acute exacerbation of COPD. It was conducted in the Pulmonology Department DHQ Teaching Hospital, Sahiwal. The treatment given to these patients was compared to treatment guidelines mentioned in the GOLD strategy document for management of acute exacerbation of COPD.

Results: Out of total 480 patients, 408 (85%) were males. 312 (65%) patients belonged to agegroup 50-70 years. 100% Gold strategy treatment standards were not followed in any patient. Five out of ten management steps were followed in all cases. While remaining five steps were followed variably.

Conclusion: Overall adherence to the AECOPD management standards set by GOLD strategy documentwas not good. Improved physician's awareness of guidelines and better adherence to treatment standards can improve patient care and outcome.

Keywords:

Acute Exacerbation of COPD, Adherence, Chest X-ray, GOLD strategy document, Spirometry

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is the third leading cause of death worldwide, ranked by the GLOBAL BURDEN OF DISEASE (GBD) and it will become the leadingcause of death in the next 15 years.[1] COPD refers to a set of heterogeneous conditions characterized by a significant limitation to airflow which can be reversed to a limited extent. This airflow limitation has progressive nature and usually occurs in response to inflammation caused by exposure to toxic agents or gases mainly through smoking.[2,3] However, early diagnosis and good treatment improve the quality of life and the average lifeexpectancy of such patients. [4]

The majority of COPD cases experience frequent exacerbations which deteriorate their health and lung reserves. Therefore, it is highly recommended to standardize COPD and its exacerbation treatment protocols according to the national or international guidelines.[4] Out of all the current COPD treatment guidelines, Global Initiative for obstructive Lung Disease (GOLD) recommendations are the most widely used by clinicians.[5] This strategy paper is helpful not only in the management of stable COPD but also for its exacerbations. By following GOLD recommendations, patient outcomes and airflow limitation are significantly improved.[6] There is a considerable extent of dissociations between efficient COPD therapies (especially GOLD) and clinical prescriptions for the management of COPD patients.[4,6,7] Only about 40-60% of the COPD patients get treated according to the recommended treatment guidelines.[5]

The main purpose of this retrospective cross-sectional study was to assess the level of adherence to the GOLD strategy document for the management of patients with acute exacerbations of COPD in DHQ Teaching Hospital, Sahiwal.

PATIENTS AND METHODS

This retrospective cross-sectional study included 480 medical histories of patients with a primary diagnosis of acute exacerbation of COPD admitted in the department of Pulmonology DHQ Teaching

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Hospital Sahiwal after approval from the institutional ethical review board through letter no 16/ME/SLMC/SWL dated 27-09-2019. Convenient sampling technique was used. The sample size was 384 participants.

The analysis included the degree of adherence to GOLD management in various pharmacological and non-pharmacological aspects. As a retrospective analysis, it did not require patient contact and included anonymized data, so there was no requirement for informed consent. A total of 480 patients were included from 01-10-2019 to 01-04-2020.

Inclusion criteria included patients of both genders having confirmed diagnosis of COPD by a respiratory specialist having post-graduate degree with age 30 years and above, who presented with an acute exacerbation, with no co-morbidities like Diabetes, Hypertension, and ischemic heart diseases.

Patients below 30 years of age, with comorbidities, with an alternative explanation of symptom worsening, and those with incomplete data were not included in the study.

Data was collected on a proforma and analysis was done through Statistical Package for the Social Science (SPSS) version 24. The results of data analysis were arranged in the form of frequency tables for each step of the GOLD guideline. The treatment steps for the management of patients with acute exacerbation of COPD were compared with GOLD strategy document 2020 for the management of acute exacerbation of COPD. The GOLD 2020 Checklist includes 10 steps for the management of acute exacerbation of COPD. For every patient chart, it was determined how many steps were followed according to GOLD 2020 guidelines.

COPD was defined as forced expiratory volume in one second (FEV_1) to the forced vital capacity (FVC) ratio < 0.70 and FEV_1 < 80% of predicted according to age, sex and height.[9] Acute exacerbation of COPD (AECOPD) was defined as a sudden worsening of symptoms in a COPD case which leads to change in daily treatment of such cases and when other non-pulmonary causes of change in symptoms like heart failure is ruled out.[10]

RESULTS

Data for 480 cases with AECOPD were studied. Out of 480 patients, 408 (85%) were males, and the remaining 72 (15%) were females. The majority of participants belonged to the age group 50-70 years (312-65%) followed by the age group more than 70 years (96-20%). Table 1 represent the demographic details

Concordance to GOLD strategy document guidelines was studied for each patient. Spirometry at admission was performed only in 10% of cases, while 100% adherence level was observed in performing Chest radiography. Arterial Blood gas analysis was performed innone of the cases. Prescription of short-acting beta-agonist (SABA), Corticosteroid, and antibiotics was 100% While the prescription of Methyl xanthine was relatively low (120-25%). Controlled oxygen was administered to 75% (360) patients. 25% (120) patients received Noninvasive ventilation (NIV), while Invasive mechanical ventilation (IMV) was used in 10 % (48) of cases. Table 2 outlines the AECOPD management recommendations and summarizes the overall adherence to each management step.

Table 1: Frequency distribution of demographic characteristics.

Characteristics	Frequency (%)
Gender	Male- 408 (85)
	Female-72(15)
Age	30-50 years- 72(15)
	50-70years-312 (65)
	>70years-96 (20)

Table 2: Observed Frequencies for each GOLD guideline recommended management step in patient of AECOPD.

COPD GOLD Guidelines	Followed n (%)	Not Followed n (%)
Spirometry at admission	48 (10)	432 (90)
ABGs	480 (100)	0 (0)
Chest X-Ray	480 (100)	0 (0)
Controlled Oxygen	360 (75)	120 (25)
Short Acting Beta Agonist (SABA)	480 (100)	0 (0)
Methyl xanthine	120 (25)	360 (75)
Corticosteroid	480 (100)	0 (0)
Antibiotics	480 (100)	0 (0)
Non-invasive ventilation (NIV)	120 (25)	360 (75)
Invasive Mechanical Ventilation (IMV)	48 (10)	432 (90)

DISCUSSION

Data analysis showed that GOLD Strategy document is being partially followed by treating physicians for the treatment of acute exacerbation of Chronic Obstructive Pulmonary Disease in our institute. Results showed that five guidelines are followed by 100% of physicians while others are followed variably. Various international researches revealed similar findings. [11] A study conducted in the USA shows that only 33% of physicians are following GOLD standards of COPD treatment. [12] Similarly, a study conducted in Turkey showed only 37.9% of patients were getting treatment according to the GOLD

treatment standards.[13] Our study also shows the same results with low adherence to the GOLD Standards in Pakistan.

Our study shows 100% adherence to a few diagnostic tests like use of Arterial Blood Gases (ABGs) and Chest X-rays. Arterial Blood Gases play an important role in diagnosis of type-2 respiratory failure which is a hall mark of exacerbation of COPD. It also helps in deciding about site of care of patient and mode of ventilation for patient. Patients with severe hypercapnia may require Non-invasive and invasive ventilation. Use of Arterial Blood Gases in patients is a good tool for early detection and estimating prognosis of severe disease as proved by many other studies[14] Similarly use of chest x-ray in acute exacerbation of COPD is necessary to detect causes of acute exacerbation of COPD like pneumonia, Pneumothorax and Pulmonary edema.[15] Our study shows all patients had chest x-rays and arterial blood gases (ABGs) which is also advocated in other guidelines especially NICE COPD guidelines.[15,16] Similarly, the use of short-acting beta-agonist (SABA), intravenous corticosteroids, and antibiotics were used in all patients with COPD exacerbation treatment. GOLD strategy document includes use of Short acting beta-agonists or use of short acting muscarinic antagonists. There is quite a debate about better short acting bronchodilator in COPD exacerbation and some studies describe effectivity of combination of these two bronchodilators. [17] However in our study short acting beta-agonist was used by all patients which is in accordance with an Australian study where majority (80%) patients received inhaled bronchodilators.[18] Similarly intravenous Corticosteroids were used in all patients showing the confidence of treating physicians about corticosteroids in improving patient symptoms and reducing hospital stay. Systemic steroids have been mainstay of COPD exacerbation management in all guidelines.[15,16] however many studies show that inhaled corticosteroids may prove beneficial in COPD exacerbation management as depicted by a clinical review published in India.[19] Despite there is a debate on the best choice of antibiotic class, the use of antibiotics has been a major point in management of COPD patients in many guidelines of COPD management other than GOLD strategy document.[15,16]

We found less than 100% adherence in other parameters for COPD exacerbation treatment. These include the use of spirometry, controlled oxygen, methyl xanthine usage, non-invasive ventilation (NIV), and invasive mechanical ventilation (IMV). Spirometry was used in10% of cases in our research. The rate of spirometry examination is extremely low among COPD patients as shown by another study.[20]

Spirometry is a great test to diagnose and manage COPD and its exacerbation but it was not used in any patient before starting treatment which is in accordance with the trends shown in a study about general practitioners who may prescribe without taking into account the spirometry results and severity.[21] Non-invasive ventilation (NIV) is the first-line therapy in appropriately selected critically ill patients with COPD but it has been used in only 25% of our patients which is against international studies in which non-invasive ventilation was used in majority of patients and was found to be very effective.[22] Use of controlled oxygen was found in majority of cases (75%) which is a high percentage considering another study which shows use of controlled oxygen in only 44% cases of acute exacerbation of COPD.[23] Our study shows use of methyl xanthine derivatives in 25% of cases which is against GOLD strategy document which refrains from routine use of methyl xanthine derivatives of acute exacerbation of COPD. This fact is proven by another study.[24] Use of invasive mechanical ventilation was in only 10% of COPD cases which points towards modern trend of more use of non-invasive ventilation as a salvage therapy before trying invasive mechanical ventilation.[25] Our recommendations after conducting this research are that there should be complete adherence to the GOLD Standards of treatment of COPD to reduce mortality rate as it is a leading cause of death. A proper prescription can reduce further exacerbation and future severe symptoms. Our research has a few limitations as it is conducted in a resource limited setting with limited availability of spirometry and non-invasive ventilation options. Results may vary in a facility with the availability of these resources. Secondly, our study did not take into account the impact of non-adherence on COPD measures and patient outcomes. More such researches should be conducted in the future to judge the management of COPD patients and results should be published for providing a source of feedback to treating physicians.

CONCLUSION

ADECOPD treatment was partially guidelines concordant. In the management of acute exacerbation

of COPD in Sahiwal, adopted treatment strategy does not fully follow the standards set by GOLD strategy document treatment. Better treatment can be given by following all parameters mentioned in GOLD strategy document. There should be better communication between the guideline authorities and the treating physicians to ensure better adherence which will result in better patient outcome with the treatment.

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