

Evaluation of Medication Adherence in Chronic Obstructive Pulmonary Disease

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Abstract

Introduction: Chronic Obstructive Pulmonary Disease (COPD) characterized by airflow limitation associated with abnormal inflammatory response of the lungs has been reported as the second leading cause of disability. In COPD, medication non-adherence leads to exacerbation and worsening of condition and hospital readmissions. Measurement or monitoring of medication adherence in COPD patients plays an important role in improving patient's health outcomes.

Objective: The present study was undertaken with the objectives to investigate the adherence pattern in the management of COPD and factors affecting patient adherence to the prescribed treatment with an aim to assess the knowledge about disease and their adherence to therapy in patients admitted at a tertiary care teaching hospital.

Methodology: Case sheet based prospective observational study was conducted for a period of 6 months after obtaining the permission from Institutional Ethical Committee, CMR College of Pharmacy, Hyderabad and the data was collected & analyzed according to the inclusion and exclusion criteria.

Discussion: A total of 70 cases were included & analyzed for the study and outcome shows that; most common age group was 51-60 years with male predominance. Study observation reveals that the elderly patients were found to be non-adherent to the therapy. Majority of the COPD patients admitted were smokers and more than half of them were present smokers. The most common reason for medication non-adherence is forgetfulness and carelessness followed by forgetfulness. The highest prescribed drug is inhaled steroid (Budecort) followed by Azithromycin antibiotic. The P-value for this study using chi-square test was found to be 0.001.

Conclusion: Present study concludes that smoking is the major risk factor of COPD and most of the patients are non-adherent to the therapy. The main reasons for non-adherence are forgetfulness, carelessness and a combination of both. Patient education has achieved the optimal results in smoking cessation.

Keywords: Chronic Obstructive Pulmonary Disease; Non-adherence; Smoking; Patient education.

Introduction

Chronic obstructive pulmonary disease (COPD) is an incurable disease that is characterized by airflow limitation associated with abnormal

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inflammatory response of the lungs to noxious particles or gases and chronic inflammation throughout the airways, parenchyma and pulmonary vasculature. COPD represents the second leading cause of disability in the United States [1]. Tobacco smoking is known to be one of the most important and major risk factors in the development of COPD [2]. and other risk factors are exposure to noxious particles, occupation, gender, genetic factors like, alpha 1 antitrypsin (ATT), Airway hyper responsiveness and allergy [3]. The specific symptoms include regular sputum production or exertional dyspnea, Cough and associated sputum production, Breathlessness, Crackles may accompany infection. Hypoxia and hypercapnia [4]. The standard treatment includes bronchodilators, corticosteroids, anticholinergics and antibiotics [5]. The WHO (World Health Organization) defines adherence to long-term therapy as 'the extent to which a person's behaviour (taking medication, following a diet, and/or executing lifestyle changes) corresponds with agreed recommendations from a health care provider. Non-adherence to medication depends on multiple factors including social, environmental, patient and treatment related factors. Non-adherence includes overuse, underuse, forgetfulness, missing a dose, doubling a dose and changes in the schedules and doses. Hence, simplifying the dosage regimen by reducing the dose frequencies is associated with increase in medication adherence [6]. Most patients generally have co-morbid conditions, which leads to suboptimal adherence. This required them to take multiple medications that lead to polypharmacy. This can be improved by proper mental and social support from family members, coworkers, caretakers, etc. synchronizing doses for patients on multiple drug therapy enhances the adherence rate [7,8]. Patient factors that lead to non-adherence are related to patient age and the complications that follow decline in the vision and muscle mass of the patient can make it difficult for the patient to read the labels on the medications, open the medication bottle and take medication according to schedule [9]. Hence, we have aimed to demonstrate various adherence and non-adherence factors in the management of COPD in a tertiary care hospital.

Methodology

This prospective observational cohort study was conducted for a period of 6 months between September 2018 and February 2019 in the Department of General Medicine, Gandhi Hospital, and Secunderabad with prior Approval from Institutional Ethical Committee, CMR College of Pharmacy and with necessary permission from Department of General Medicine, Gandhi Hospital, and Secunderabad. Selected cases were collected and documented in a structured data compilation form from the in-patient department of General Medicine on a daily basis according to inclusion criteria, which includes; Patients with confirmed diagnosis of Chronic Obstructive Pulmonary Disease along with a complete information till discharge. Patients with other pulmonary diseases, paediatrics department, pregnant women, cases with incomplete information and patients absconded during the study were not included. A total of 70 cases with justified inclusion criteria were collected during the study period which was reviewed on a regular basis to update and

further follow-up till discharge. Demographic and clinical data was collected by the study investigator from patient case sheets and documented. The demographic and clinical data included Age, Gender, Etiology parameters, Smoking status, and education and adherence relation, Recurrence of COPD, Patients with co morbidities, medication adherence rate and list of medications. All the data were collected and checked for completeness by the study investigators. Outcome was framed after interpreting the data gathered from case documentation forms and medication adherence scale; according to various category and parameters.

Inclusion criteria:

1. In- patient wards of general medicine and pulmonology
2. COPD cases with co- morbid conditions

Result

A total of 70 cases were identified, included and analyzed for final outcome.

Table 1: Shows that age wise distribution where most of cases fall within the age group of 51-60 years and medium adherence is seen in this age group. Highest number of patients with low adherence was seen in 61-70 age group.

Age Group	Low	Medium	High	Total
31-40	2	0	2	4
41-50	3	5	1	9
51-60	8	13	2	23
61-70	10	9	1	20
71-80	7	6	0	13
81-90	0	1	0	1
Total	30	34	6	70

Table 2: Shows that gender wise distribution where most of cases among males shows medium adherence and among females' low adherence is more.

Gender	Low	Medium	High	No. of patients (%)
Male	24	31	5	60 (85.71%)
Female	6	3	1	10 (14.28%)

Table 3: Highlights the relation between education and adherence smoking. Out of 34 patients with medium adherence, 15 patients are smokers and 15 patients are non-smokers.

ADHERENCE	EDUCATED	NON-EDUCATED
High	4(1 smoker)	2(1 smoker)
Medium	17(15 smokers)	17(15 smokers)
Low	14(8 smokers)	16(13 smokers)

Table 4: Highlights the place of exposure for COPD in Women which concluded that Low adherence is seen in females at home as well as in work place.

Exposure place	Low	Medium	High	No. of Patients
Home	4	3	0	7 (70%)
Work place	2	0	1	3 (30%)

Table 5: Highlights the reoccurrence of COPD which concluded that Recurrent COPD was present in 26 patients.

Recurrent COPD	Low	Medium	High	No. of Patients (%)
Yes	15	9	1	26 (37.14%)
No	15	25	5	44 (62.85%)

Table 6: Shows that vast numbers of patients are with co morbidities.

COPD with Comorbidities	Low	Medium	High	No. of Patients
Yes	24	24	3	51
No	6	10	3	19

Table 7: Shows that Adherence rate where most of cases fall within the group of medium adherence (48.57%) followed by lower adherence (42.85%).

Adherence Rate	No of patients (%)
Low	30 (42.85%)
Medium	34 (48.57%)
High	6 (8.575%)

Table 8: Shows that Adherence pattern where most of cases fall within the group of forgetfulness and carelessness (31.42%) followed by forgetfulness (27.14%).

Adherence Pattern	No. of patients	%
Forgetfulness	19	27.14
Carelessness	8	11.42
Forgetfulness and Carelessness	22	31.42
Financial problem	12	17.14
Discontinued dose	5	7.14
Symptomatic relief	10	14.28

Discussion

- Out of 70 In-patients of the Department of General Medicine in a tertiary care teaching hospital, a majority of COPD patients encountered were males than females. This reflects on the overall higher prevalence of the disease process in male gender which in turn can be linked to other factors such as cigarette smoking and alcohol consumption which are more common in males. This data is in accordance with the study done by Ntritos.G et al (2017) [10].
- Majority of patients in our study were found to be in the age group of 51-60 years. This is contradicting the study done by Osman.S et al (2017) [11] which states that majority of the COPD patients were older than 65 years. Also, in our study, the elderly patients were found to be non-adherent to the therapy which is contradicting the study done by T.Agh et al (2011) [12] which concludes that patients of advanced age are more adherent.
- In our study the literacy and illiteracy were found to be in equal ratio among the patients which is in accordance with the study done by Faheemuddin MD et al (2016) [2]. From our study, we found that the most of the patients were smokers and smoking is important risk factor for decreased lung function in accordance with the study done by S. Frantz (2014) [13].
- In our study, majority of the COPD patients admitted were found to be smokers. Similar results were given by Laniado-Laborin.R (2009) [14] who explain that cigarette smoking generates reactive oxidant substances which cause an inflammatory process in lung and its airways. This leads to the readmission of smoking patients. In our study, more than half of the patients were alcoholic. According to Wetherbee. E (2015) [15] high level of alcohol consumption impairs airway clearance. This can increase the risk of developing COPD.

- From our study, we concluded that most of the patients have medium level of adherence followed by patients with low level of adherence. This contradicts the study done by Galal.I.H et al (2018) [16] who's results showed that a greater number of patients were found with low adherence compared to patients with medium adherence.
- In our study, the most commonly seen disease conditions in COPD patients belong to cardiovascular system. Elastin loss and increased arterial stiffness was the common factor in association of COPD and cardiovascular risk in accordance with Mona Bafadhel(2016) [17] In our study, smoking status of more than half of the cases was found to be present smokers in accordance with Kokturk. N et al (2017) [18].
- In our study, Recurrent COPD was present in 26 patients and increased exacerbation risk is related to severity of COPD, co morbidities in accordance with Marco Mantero et al (2017) [19]. In our study, vast numbers of patients were found to be with co morbidities. According to Jennifer. S Albrecht et al (2017) [20] poor adherence was seen in patients having 2 or more number of co morbidities.
- Our study findings show that risk of exposure to COPD in women is mostly seen at home, followed by work place. Occupational exposure to biological dust is associated with increased risk of developing COPD particularly in women. This is because the inflammatory process gets activated. This is in accordance with Mathson et al (2005) [21].
- In our study, among 70 cases the highest prescribed drug is inhaled steroid (Budecort) followed by azithromycin antibiotic which is in accordance with the study done by Mahadeo P Sawaut et.al (2017) [22] who reported that inhaled corticosteroids and antibiotics shortens recovery time, improve lung function and reduce risk of co-morbid conditions.
- In our study, the most common reason for medication non-adherence is forgetfulness and carelessness followed by forgetfulness. Forgetfulness was reported as the most frequent cause of non-adherence according to the study done by J. Bourbeau (2007) [23]. Our study results were also in accordance with Masaya Takemura (2011) [24] who reported that more than half of patients missed or skipped doses of their medication.
- Among 70 cases, Hypertension is most commonly seen. Hypertension is one of the major risk factors for cardiovascular disease, which in turn is an important contributor to poor prognosis and mortality in COPD in accordance with study done by Seon- Hye Kim (2017). [25] P value for this study was calculated using chi-square test and it was found to be 0.001 in accordance with Shrestha. R et al (2015) [26].

Conclusion

A total of 70 patients were enrolled in this study. Most of the patients were found to be non-adherent to the therapy. The most importance factors for non-adherence

are forgetfulness, carelessness and a combination of both. More number of smokers are suffering from the disease and patient education has achieved the optimal results in smoking cessation. P value for medication adherence was found to be 0.001.

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