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Research article

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### A study of drug utilization in patients with chronic obstructive pulmonary disease (COPD) in Mahavir institute of medical sciences, vikarabad, Telangana state

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#### ABSTRACT

##### Background

Drug utilization research is to facilitate the rational use of drugs in populations. Chronic obstructive pulmonary disease (COPD) requires extensive treatment with multiple drug therapy. Due to its increasing prevalence and complications, it is rapidly becoming one of the world's most serious health issues. It is necessary to treat the disease at the earliest with proper monitoring and evaluation of the therapy to prevent further progression and associated complications.

The present study was undertaken to understand the prescription pattern of patients diagnosed with COPD in a tertiary care hospital, Mahavir institute of medical sciences.

##### Methods

A prospective, observational study was conducted over a period of 6 months, among the 100 patients admitted in patient department of medicine ward. Data was collected from COPD Patients admission records. Parameters like demographic profile, common associated diseases, WHO core drug indicators and commonly prescribed drugs were assessed from the prescriptions.

##### Results

It was found that the prevalence of COPD was higher in Grade III patients (78%), followed by 12% in Grade II and 10% in Grade I. Grading was done based on the socioeconomic status. Males (68%) were more affected than females (32%) and among the patients affected 32 were alcoholics and 37 were smokers.

##### Conclusion

In present study corticosteroids, methyl xanthenes and antibiotics were more used when compared with other drugs. Majority of the prescriptions were in accordance with Global initiative for chronic obstructive lung disease (GOLD) criteria recommendations.

**Keywords:** COPD, Bronchodilators, Drug utilization

## INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is not one single disease but an umbrella term used to describe chronic lung diseases that cause limitations in lung airflow. The more familiar terms 'chronic bronchitis' and 'emphysema' are no longer used, but are now included within the COPD diagnosis. The most common symptoms of COPD are breathlessness, or a 'need for air', excessive sputum production, and a chronic cough. However, COPD is not just simply a "smoker's cough", but an under-diagnosed, life threatening lung disease that may progressively lead to death.

### Main risk factors for COPD

- Tobacco smoking
- Indoor air pollution (such as biomass fuel used for cooking and heating)
- Outdoor air pollution
- Occupational dusts and chemicals (vapours, irritants, and fumes)
- The Global Burden of Disease Study reports a prevalence of 251 million cases of COPD globally in 2016.
- Globally, it is estimated that 3.17 million deaths were caused by the disease in 2015 (that is, 5% of all deaths globally in that year).
- More than 90% of COPD deaths occur in low and middle income countries.

Chronic obstructive pulmonary disease (COPD) is affecting 251 million lives globally and it causes 3.15 million deaths per year. More than 90% COPD-related deaths happen in low and middle-income countries. In India, three out of five leading causes of mortalities constitute non-communicable diseases whereas COPD is the second biggest cause of death. The prevalence of COPD has increased by 29.2% by 2016 which is a serious public health concern. The clinicians require treating COPD as per the evidence-based guidelines and managing the comorbidities. To avert the cost of care, an integrated and highly efficient system is required which can promote healthier lifestyle and self-management of the symptoms through a team-based approach comprising different healthcare professionals for delivering planned care. Moreover, smoking and other risk factors should be controlled considering the future benefits of the nation. Also, air pollution and other environmental risk factors are deteriorating day

by day in India that is evident in the recently published Environmental Performance Index in which India ranked fourth worst country in the world. To improve the burden of COPD, multifaceted strategies should be adopted to promote positive respiratory health in the individual and population level [1-3].

## METHODS

The study is a prospective observational study, conducted over a Period of 6 months.

### Study population

The study group consists of 100 patients, either sex, diagnosed with COPD patients admitted in department of medicine ward, TB & Chest wards of Mahavir institute of medical sciences, Vikarabad, Telangana, India.

### Inclusion criteria

- ✓ Patients of either sex, aged  $\geq 18$  years.
- ✓ Patients who diagnosed COPD along with or without co-morbidities.
- ✓ Smokers, non-smokers, alcoholics.
- ✓ Patients working in polluted industrial areas.

## PROCEDURE

Institutional Ethical Committee (IEC) approval was taken before conducting the study. The clinical, demographic and medication data was documented into case report form (CRF). Data was collected from COPD patients admission records. Parameters like demographic profile, common associated diseases, WHO core drug indicators and commonly prescribed drugs were assessed from the prescriptions.

### As per the socioeconomic status, the study, patients were divided into three grades as follows

- Grade I for people in administration.
- Grade II for employees and clerical staff.
- Grade III for farmers, security guards in industrial area, drivers, construction workers etc.

## RESULTS

It was found that the prevalence of COPD was higher in Grade III patients (78%), followed by 12% in Grade II and 10% in Grade I [Table 1].

Males (68%) were more affected than females (32%), among the patients 37 members were alcoholics and 32 were smokers.

**Table 1. Demographic details of the study population**

PARAMETER	PERCENTAGE (%)
Gender-wise percentage distribution of study patients	Males 68% Females: 32%
Age-wise percentage distribution of study patients	31 - 40 Yrs : 8 % 41-50yrs:17 % 51-60yrs:28 % 61-70yrs:34 % > 70yrs: 13%
Social status of the study patients	Alcohol consumption:32% Smoking 37%
Status of patients with smoking history	Reformed smokers: 12% Current smokers 20%
Socioeconomic status of the study patients	Grade I : 10% Grade II: 12% Grade III: 78%

**Table 2. Pharmacological class-wise distribution of drugs prescribed for the management of COPD**

Class of drug	Number of drugs prescribed	Percentage (%)
β2-agonists	74	15.5%
Corticosteroids	86	18.0%
Anticholinergics	75	15.7%
Methylxanthines	83	17.4%
Mucolytics	44	9.2%
Antibiotics	82	17.1%
Oxygen therapy	33	6.9%

**Table 3. Types of Co-morbidities with COPD among study patients.**

Co-morbidity	No. of prescriptions (N = 100)	Percentage (%)
COPD + HTN	14	14%
COPD + HTN + T2DM	11	11%
COPD + Anaemia	5	5%
COPD + T2DM	6	6%
COPD + Asthma	4	4%
COPD + Gastritis	3	3%

HTN – hypertension

T2DM – type 2 diabetes mellitus

## DISCUSSION

The Monotherapy prescription pattern was evaluated which showed the following drugs being commonly prescribed. The drugs were Deriphylline, Doxiphylline, Ciprofloxacin, Theophylline, Hydrocortisone, Cefotaxime, Levofloxacin, Ceftriaxone, Prednisone, Azithromycin and levosalbutamol. Depending upon each patient condition and severity, it was observed that the oral

route is the most common route of administration followed by, inhalation and parenteral routes.

In the assessment of combination therapy for COPD, we found that, salbutamol + ipratropium bromide was most commonly prescribed. Also, combinations of Dexmethorphan + Bromohexine, Piperacillin + Tazobactam, Amoxicillin + Clavulanate, Ipratropium bromide + fluticasone were used in the combination therapy.

As, COPD patients present acute exacerbations with underlying infection, the antibiotics given for treatment of COPD were also evaluated. It was observed that Ciprofloxacin was the most prescribed antibiotic for COPD followed by Cefotaxime, Piperacillin-Tazobactam, Levofloxacin, Ceftriaxone, Azithromycin and Amoxicillin-Clavulanate.

In the study, 43% patients presented COPD with co-morbidities in which, hypertension (14%) was the most common co-morbidity accompanied by hypertension with type-2 diabetes mellitus (11%), anemia (5%), type-2 diabetes mellitus (6%), asthma (4%), gastritis (3%). When prescribing drugs to COPD patients with co-morbid conditions, drug interactions have to be carefully monitored.

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## CONCLUSION

Many of the patients in the present study had co-morbid conditions (n= 43; 44.4%). The most commonly observed co-morbid conditions were hypertension and Type II diabetes mellitus.

The results suggest that prevalence was higher in males than females and in smokers than non-smokers.

Most common prescribed class of drugs were corticosteroids, Methylxanthines (Theophylline 93.3%) and Antibiotics. Majority of the prescriptions were in accordance with GOLD criteria recommendations.