

# Drug Utilization Pattern in the Management of Chronic Obstructive Pulmonary Disease (COPD) in a Tertiary Care Hospital of Nepal

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## Abstract

**Background:** Chronic obstructive pulmonary disease (COPD) is one of the major causes of death around the world. Early detection and management can decrease disease progression and mortality. COPD cannot be managed with monotherapy and requires multidrug therapy. The present study planned to assess the drug utilization pattern in COPD patients.

**Aim and Objective:** The aim of the study was to assess the pattern of common drugs used in COPD patients.

**Materials and Methods:** This study was conducted in the Department of Pharmacology, Kathmandu Medical College and Teaching Hospital, Nepal. According to study protocol, a total of 160 patients were included in the study. All the patients' demographic, clinical and medication details were collected and analyzed.

**Results:** A total of 160 COPD patients were analyzed. Among them 101 were males and 59 were females. The mean age of the study population was  $61.87 \pm 6.85$ . The corticosteroids were the most common drugs prescribed (26.53%) followed by LABA and anticholinergics.

**Conclusion:** The study results concluded that most of the patients were taking corticosteroids. The main predisposing factor for COPD was found to be smoking.

**Key Words:** Chronic Obstructive Pulmonary Disease, Drug Utilization, Adverse Drug Reaction

## Introduction

Chronic obstructive pulmonary disease (COPD) is a common disease affecting 10% of the global population and has significant morbidity and mortality (1). Chronic obstructive pulmonary disease (COPD) is one of the common diseases related to respiratory tract with progressive and treatable condition. The vital characteristic feature of COPD is an irreversible airflow restriction (2). One of the prominent events in COPD is an exacerbation which is described as the presence of worsening symptoms along with local and systemic inflammation. COPD is one of the most serious health issues globally. According to WHO, 65 million people have moderate to severe Chronic obstructive pulmonary disease. COPD usually remains under detected and under managed making it fifth cause of morbidity and mortality in developed world (3). Drug utilization study is an evaluation tool to identify the problems regarding drug use and helps prescribers to create awareness about rational drug use. It provides useful patterns into recent prescribing practices and can help to re-establish and update utilization practices in respiratory medicine and pharmacotherapy (4). Obstructive airway disease can be detected by spirometry and other type of lung function tests. Spirometry and the calculation of FEV1/FVC allow us to identify obstructive or restrictive ventilatory defects (5). General aim for COPD management are symptoms control, maintaining normal physiological performance, minimizing the risk of exacerbations, fixed airway obstructions, and adverse effects of the pharmacotherapy. Inhalation therapy is preferred in COPD as it provides high local concentrations, lesser side effects, and good tolerance (6). Drugs used in the management of COPD include short and long-acting  $\beta$ -2 receptor agonists, corticosteroids, theophylline, short and long-acting muscarinic antagonists, roflumilast, antibiotics and mucolytics (7). It was found that selection of drugs principally depends on pharmacokinetics, pharmacodynamics, and comorbid conditions. According to different studies, short-acting beta agonists are the first choice followed by steroids, mast cell stabilizers, and antibiotics. GOLD strategy is the most recommended method for the treatment of COPD patients (8, 9).

Drug utilization evaluation (DUE) is mainly used to evaluate the drug use pattern; use of irrational drugs; intervention to improve and update the drugs used and quality control. Taken together, treatment of COPD mostly requires multiple drug therapy with proper assessment and monitoring.

## Methods

**Study design and duration:** This study was conducted in Department of Pharmacology after obtaining clearance and approval from the Institutional Review Committee (IRC) of Kathmandu Medical College. It was a prospective, observational study, conducted on 160 consecutive cases of COPD over a period of 6 months from July 2024 to December 2024 in the internal Medicine OPD of Kathmandu Medical College, Nepal.

### Inclusion criteria:

- Patients of all age groups (45-75) having COPD as the primary diagnosis attended the outpatient Department of Medicine.

### Exclusion criteria:

- Patients having tuberculosis.
- Patients admitted in Intensive Care Unit (ICU).
- Pregnant women.
- Patients not intending to participate.

### Study procedure:

A written informed consent was taken from each patient involved in the study. Relevant data which included the following details were personally collected by the investigators from all patients.

- Demographic data: patient age, gender
- Smoking history
- Disease condition details
- Drug prescribed for treating COPD were assessed and analyzed as per GOLD treatment guidelines (10), disease severity was categorized according to guidelines (11).

**Statistical Analysis:** The data was analyzed with the help of Microsoft Excel software.

## Results

Table 1: Demographic parameters of the study population (N=160)

Gender	Number of Patients	Percentage
<i>Male</i>	101	63.12%
<i>Female</i>	59	36.88 %

Table 2: Age wise distribution of the study population (N=160)

Age	Number of Patients	Percentage
<i>45-55</i>	20	12.5 %
<i>56-65</i>	59	36.87 %
<i>66-75</i>	81	50.62 %

Table 3: Status of patients with smoking tendency (N=160)

Smoking Status	Number of Patients	Percentage
<i>Current Smoker</i>	46	28.75 %
<i>Ex-Smoker</i>	88	55.00 %
<i>Non Smoker</i>	26	16.25 %

Table 4: Comorbid conditions of the study population

Comorbid condition	Number of patients	Percentage
<i>Hypertension</i>	36	39.13 %
<i>Type 2 Diabetes</i>	15	16.30 %
<i>Ischemic Heart Disease</i>	12	13.04 %
<i>Hypothyroidism</i>	08	08.69 %
<i>Rheumatic Arthritis</i>	07	07.60 %
<i>Anaemia</i>	03	03.26 %
<i>Others</i>	11	11.98 %

Table 5: Class-wise prescription of drugs for the management of COPD (N=160).\

Class of Drugs	Number of Patients	Percentage
<i>Corticosteroids</i>	130	26.53 %
<i>SABA(Short-Acting Beta Agonists)</i>	59	12.04 %
<i>LABA(Long-Acting Beta Agonists)</i>	95	19.38 %
<i>Antibiotics</i>	65	13.26 %
<i>Anticholinergics</i>	76	15.51 %
<i>Methylxanthines</i>	44	08.97 %
<i>Leukotriene modifiers</i>	21	04.28 %

**Table 6: Antibiotics prescribed to the patients**

Antibiotics	Number of Patients	Percentage
<i>Amoxicillin+Potassium clavulanate</i>	18	27.69 %
<i>Doxycycline</i>	22	33.84 %
<i>Cephalosporins</i>	07	10.76 %
<i>Azithromycin</i>	11	16.92 %
<i>Clarithromycin</i>	05	07.69 %
<i>Levofloxacin</i>	02	03.07 %

A total of 160 prescriptions of COPD patients were collected from the department of internal medicine. Out of all 160 patients, 101 (68.12%) patients were males and 59(36.88%) patients were females (Table 1). Most of the patients were either ex-smokers (55%) or smokers (28.75%) with only 10.9% non-smokers (Table 3). The most common associated comorbidities were hypertension (39.13%) and Type II diabetes (16.30%) in the study population (Table 4). Figure 2 shows that the most frequently prescribed group was corticosteroids (26.53%) followed by LABA and anticholinergics. In the management of COPD patients, 51% received inhalation, 39 % received oral and 10 % parenteral (Figure 1). It was observed that maximum numbers of patients were using nebulizer (97.33%). About 62.76% of drugs were prescribed from essential drug list (Table 6).

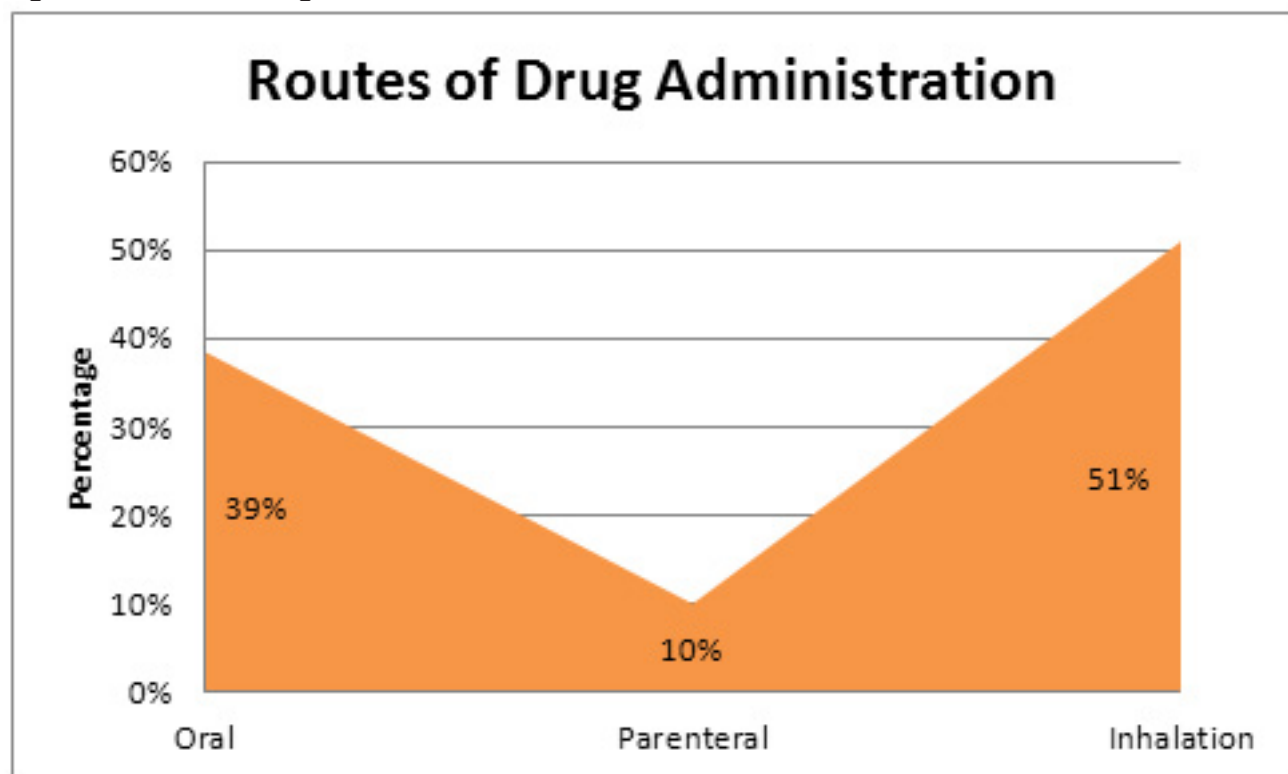
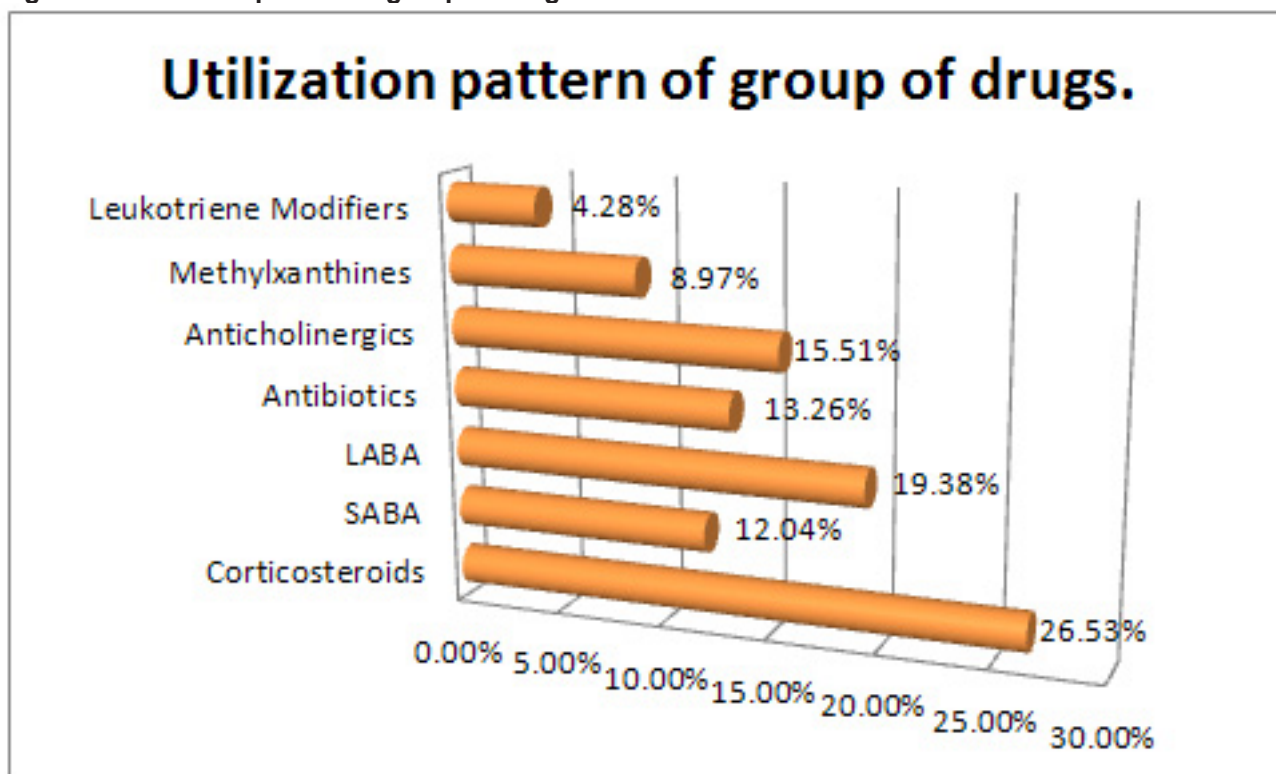
**Figure 1: Routes of drug administration**

Figure 2: Utilization pattern of group of drugs



## Discussion

This study was done on 160 COPD patients. Treatment of COPD with multiple complications needed multiple drug therapy with minimal ADRs. Selection of medicine is the major challenge to manage COPD.

Drug utilization studies are important in facilitating rational drug use (12). These studies can help hospitals to evaluate and improve the prescribing and administration of medications (13).

In our study, it was observed that there were a greater number of male patients (68.12%) than female patients (36.88%). This is similar to a previous study by Niffy et al. in which male patients (75.2%) were more compared to female patients (24.8%) (14).

We found history of smoking in 83.75% of patients which is in line with the study of and Maryam M. Hypertension was most common comorbid condition among our study population which is similar to the results obtained from the study of Sawant MP et al (15) and Unni A et al (16).

In the present study, all the patients are aged between 45 and 75 years. It was observed that middle age to old age people are more prone to COPD. A study was done by Koul et al. showed that COPD incidence was more among the age between 60 and 70 years (17).

According to COPD treatment guidelines, inhalers are the most common method of drug delivery to increase patient compliance. The major cause of for increase in the usage of inhalers is easy to carry and administration. Our study also showed most of the patients preferred inhalers compared to oral or injectable. Dhand et al (18).

## Conclusion

In conclusion, this study shows the drug utilization patterns that were used in the treatment of COPD in a tertiary care hospital of Nepal

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