

Research Article

Medication Use Pattern Among Patients With FEV₁/FVC > 70 %: A Description of Real World Data

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ARTICLE INFO

ABSTRACT

Article history:
Received: 26/11/2022;
Revised: 08/12/2022;
Accepted: 27/12/2022.

Key Words:

Drug prescribing,
Drug use patterns,
FEV₁, FVC,
Obstructive lung
disease

Please cite this
article as: Gulam
Khan, et al.
Medication Use
Pattern Among
Patients With
FEV₁/FVC > 70 %: A
Description of Real
World Data. 4(5),
119-124.

Obstructive lung disease is a major problem affecting millions of people worldwide. Treatment of lung diseases is crucial and drug therapy needs to be assessed to determine the clinical outcomes. Therefore, this study aimed to identify the drug use patterns in a respiratory disease center concerning FEV₁/FVC in terms of prescribing indicators, patient care indicators, and drug use patterns. A cross-sectional descriptive study was conducted at Medicine OPD of GP Koirala National Centre for Respiratory Disease, Dulegaunda, Tanahun, Nepal. This includes a study population of 95 obstructive lung disease patients. Detailed information regarding demographics, drug prescribing, dispensing, and use were collected and analyzed. It was observed from the study that a higher number of drugs are prescribed per prescription to obstructive lung disease patients. Generic prescribing was less practiced with higher antibiotic encounters. Evidence of lower consultation time in a pharmacy and a lower number of adequately labeled drugs was determined. Furthermore, the patient's knowledge of the correct dosage was low. Therefore, more similar studies are required in the future to determine the appropriate interventions for the improvement of overall drug prescribing, dispensing, and use patterns in obstructive lung disease patients.

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INTRODUCTION

Spirometry, a major diagnostic tool for assessing lung function, measures the volume of air that the patient can expel from the lungs after a maximal inspiration (Johns *et al.*, 2014). Interpretation of spirometry involves the absolute values of forced expiratory volume in one second (FEV₁), forced vital capacity (FVC), and FEV₁/FVC ratio i.e. forced expiratory ratio (FER) compared with predicted values and examining the

shape of the spirogram for diagnosis of obstructive and restrictive patterns of the lung disease (Haynes, 2018). The prevalence of obstructive lung disease is rapidly increasing (Adeloye *et al.*, 2022). The difference in the distribution of risk factors (e.g., demographic, environmental, socioeconomic, and geographic factors) for obstructive lung disease may explain the differences

in prevalence among developed, developing, and underdeveloped countries (Aaron *et al.*, 2016).

Obstructive lung disease is commonly caused by asthma, COPD, cystic fibrosis, and bronchiectasis (Athanzio, 2012). The complexity of prescribed drugs for obstructive lung disease and low rates of medication compliance poses a major challenge to their effective management resulting in suboptimal patient care (Restrepo *et al.*, 2008). Non-compliance results in high medical and social costs and the lack of effective methods to deal with it have encouraged interest in the complexity of disease management (Bourbeau and Bartlett, 2008) (Jones *et al.*, 2004).

Estimates by the World Health Organization (WHO) indicate that half of the medicines are incorrectly prescribed, dispensed, or sold globally and half of the patients cannot not use them correctly. (Mamo and Alemu, 2020) Unsafe and ineffective treatment, prolonged disease state, morbidity and mortality, and increase in treatment costs are the direct effects of irrational use of medicines (Atif *et al.*, 2018) (Ofori-Asenso and Agyeman, 2016). Evaluation of drug use patterns plays a pivotal role in aiding with the complexity faced in drug therapy of obstructive lung disease via understanding, evaluating, interpreting, and improving the prescribing practices, administration, and medication use (Jyothi *et al.*, 2020). Assessments of drug use patterns utilizing the WHO prescribing indicators, for problem identification, have been successfully used in more than 30 developing countries (Desalegn, 2013). To date, no studies from Nepal have reported on drug use patterns in a respiratory disease center based on WHO core indicators. Therefore, this study aimed to identify the drug use patterns in a respiratory disease center concerning FEV₁/FVC in terms of prescribing indicators, patient care indicators, and drug use patterns.

MATERIAL AND METHOD

A cross-sectional descriptive study was conducted at Medicine OPD of GP Koirala National Centre for Respiratory Disease, Dulegaunda, Tanahun, Nepal – a national respiratory specialized hospital. The data collection period was for three months from December

2021 to February 2022 including all the working days of the hospital. Ethical clearance for the study was obtained from Institutional Review Committee (IRC), Pokhara University Research Center (PURC), Pokhara University, Kaski, Nepal on September 23, 2019 (Reg. No.: 98/076/077), and permission to conduct the study was also obtained from GP Koirala National Centre for Respiratory Disease (Reg. No.: 69/078/079). Verbal consent of patients was taken before data collection. Privacy and confidentiality of the obtained information were maintained as per ethical guidelines.

The Census sampling technique was applied for the data collection from individuals fulfilling the inclusion criteria of the study. A structured questionnaire was used to collect demographic information. A drug utilization study was conducted using WHO Core indicators along with some complementary indicators. Drugs used were categorized as bronchodilators, anticholinergics, antibiotics, and others.

Inclusion criteria:

- Patient attending to the chest OPD at GP Koirala National Centre for Respiratory Disease.
- Patient with the availability of complete pulmonary function test and having FEV₁/FVC > 70%.
- Patient willing to participate in the study.

Exclusion criteria:

- Patient without complete pulmonary function test.
- Patient with FEV₁/FVC < 70%.
- Patient not willing to take part in the study.

Data entry was carried out using a software EpiData version 3.1. Collected data was exported to Statistical Package for Social Science (SPSS) version 16 for its analysis and interpretation. Descriptive analysis was performed using a frequency table. Numeric values are presented as mean ± standard deviation (S.D.).

RESULTS AND DISCUSSION

A total of 95 patient encounters were assessed prospectively which constituted 46.3% males and 53.7% females. The mean age of patients was 56.71 ± 16.39 years.

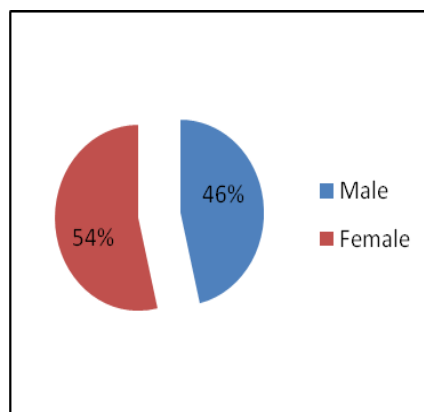


Fig.1: Gender Distribution

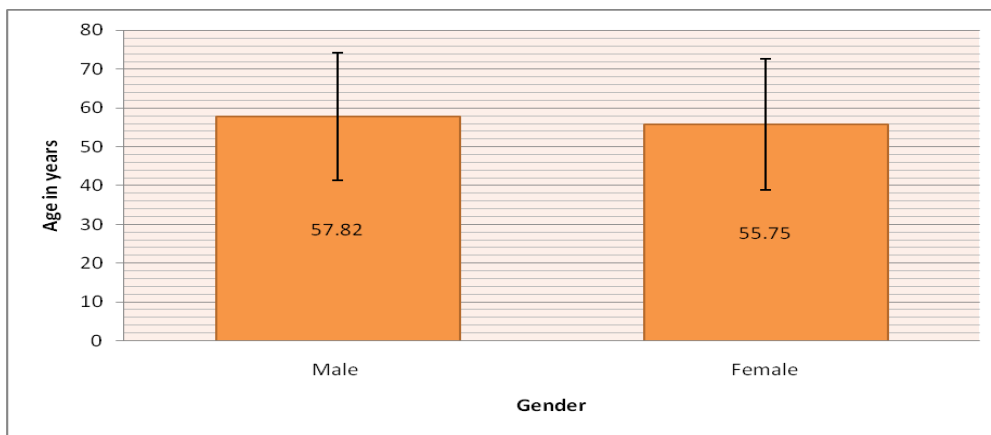


Fig.2: Age distribution means (±SD)

Table 1: Drug use indicators

WHO Core indicators	
Prescribing indicators	
Average number of drugs per encounter	4.01
Percentage of drugs prescribed by generic name	29.22 %
Percentage of encounters with an antibiotic prescribed	46.32 %
Percentage of encounters with an injection prescribed	1.05 %
Percentage of drugs prescribed from essential medical list or formulary	98.95
Patient care indicators	
Average consultation time (in Sec)	168.89
Average dispensing time (in Sec)	105.13
Percentage of drugs actually dispensed	100 %
Percentage of drugs adequately labelled	61.94 %
Patients' knowledge of correct dosage	43.30 %
Facility indicators	
Availability of copy of essential drugs list or formulary	Yes
Complimentary indicator	
Average cost of prescription	Rs.1,590.29

Table 2: Medicine use pattern

Class of Drug	Drug	Frequency	
B ₂ agonist (42)	SABA	Asthalin	39
		Salbutamol	2
	LABA	Salmeterol	1
Anticholinergic (50)	SAMA	Ipravent	3
	LAMA	Tiova	47
Combination (67)	Salmeterol & fluticasone propionate	Seroflow	51
	Formoterol fumarate and budesonide	Forecourt	13
	Beclomethasone Dipropionate & Levo-salbutamol Sulphate	Aerocort	3
Steroids (16)	Inhaler	Budocort	5
	Oral	Prednisolone	11
Antibiotics (49)	Azithromycin		13
	Amoxi-clav		19
	Levofloxacin		11
	Doxycycline		5
	Cefexim		1
Others (157)			157

SABA: Short acting beta agonist, LABA: long acting beta agonist, SAMA: Short-acting muscarinic antagonist, LAMA: long acting muscarinic antagonist

A sum of 381 drugs was encountered in 95 prescriptions. The average number of drugs per encounter was 4.01, with a minimum and maximum of 1 and 9 drugs per prescription, respectively. Out of 381 drugs encountered, 109 (29.22%) were prescribed by generic name. The percentage of encounters in which antibiotics were prescribed was 46.32%. A 1.05% prescription was encountered with an injection. The percentage of drugs prescribed from the national list of essential medicines (NLEM) or formulary was 98.95%. The average consultation time was 168.89 seconds. The average dispensing time was 105.13 seconds. Altogether, 381 drugs prescribed were completely dispensed. The level of 236 (61.94%) drugs dispensed was adequately labeled. The percentage of patients' knowledge of the correct dosage was 43.3%. The estimated cost per prescription was Rs. 1590.29. Out of 381 drugs prescribed, Beta-2 agonists, anti-cholinergics, and a combination of Beta-2 agonists and corticosteroids were prescribed in 42, 50, and 67 cases, respectively. Steroids alone were prescribed in 16 cases. In the total of 381 drugs prescribed, 12.86% were antibiotics. The most commonly prescribed antibiotics were amoxiclav (38.77%), azithromycin (26.5%), levofloxacin (22.4%), and doxycycline (0.2%). A total of 157 miscellaneous drugs were prescribed as per the comorbid case of patients which included hypertension, diabetes, hypothyroidism, and gastrointestinal (GI) related problems.

In both the developed and the developing world, inappropriate and ineffective medication use is commonly observed in health care systems. Various forms of inappropriate prescribing often remain the mainstay of irrational drug use (Ofori-Asenso and Agyeman, 2016). To quantify drug use patterns in a health facility, drug use indicators have been developed by WHO (Wendie *et al.*, 2021).

Prescription is filled according to the presented symptoms and prognosis depends upon the rationality of the prescription. The result of this study revealed that the average number of drugs per patient encounter was 4.01, which is higher than the results seen in other countries like Saudi Arabia 2.4 (El Mahalli, 2012), Egypt 2.5 (Akl *et al.*, 2014), Tanzania 2.3 (Massele *et al.*, 2001), and Ethiopia 2.2 (Angamo *et al.*, 2011) attributed to the differences in the research sites. This study included a Respiratory Disease Centre where most of the patients were presented with various comorbid conditions and hence required a greater number of prescribed drugs.

In the context of Nepal, medications are mostly prescribed by their brand names and the practice of generic prescription is relatively poor as compared to developed countries. Therefore, only 29.22% of medications were prescribed by generic names.

The antibiotic prescription was observed in 46.32% of cases. In contrast to our findings, the percentage encountered with an antibiotic was higher in Jordan 60.9% (Otoom *et al.*, 2002) and Cambodia 66.0% (Chareonkul *et al.*, 2002) whereas lower in Saudi Arabia 32.2% (El Mahalli, 2012), Egypt 39.2% (Akl *et al.*, 2014), Tanzania 35.4% (Massele *et al.*, 2001), and Ethiopia 24.9% (Angamo *et al.*, 2011). Irrational antibiotic prescribing is a global problem that leads to adverse drug reactions and subsequent frequent hospital visits. (Atif *et al.*, 2018) Unavailability of proper clinical practice guidelines, lack of competencies among health care professionals, and increased tendency to prescribe broad-spectrum antibiotics could be the major reasons for over-prescribing of antibiotics (Nepal *et al.*, 2021).

The present study acknowledged that the encounters with an injection prescribed were 1.05% which is much lesser as compared with other countries; Tanzania 19% (Massele *et al.*, 2001), and Ethiopia 10.6% (Angamo *et al.*, 2011). The percentage of drugs prescribed by the NLEM in the study was found to be 98.95% which is approximately close to countries like Ethiopia 95.4% (Angamo *et al.*, 2011) and Cambodia 99.7% (Chareonkul *et al.*, 2002). Our study was conducted in a government health care center where non-essential medicines are rarely procured and hence the percentage of drugs prescribed by NLEM is approximately absolute.

The effectiveness of the pharmacy services mainly depends on the consultation time that the patient receives. As per our study, the average consultation time is 2.81 mins which were found to be less than that in Saudi Arabia 7.3 mins (El Mahalli, 2012), Egypt 7.1 mins (Akl *et al.*, 2014), Tanzania 3.6 mins (Massele *et al.*, 2001), Ethiopia 6.2 mins (Angamo *et al.*, 2011), and Cambodia 4.4 mins (Chareonkul *et al.*, 2002). The short consultation time in our study could be correlated to the busy pharmacy, lack of infrastructure, and lack of expertise in providing optimal pharmaceutical services. The study reported an average dispensing time of 105.13 seconds. This finding is almost comparable to the finding from Saudi Arabia 100 seconds (El Mahalli, 2012). However, dispensing time was higher in Cambodia 234 seconds (Chareonkul *et al.*, 2002). Shorter dispensing time would be a major reason for inappropriate drug use, higher patient load, and unwanted drug effects (Atif *et al.*, 2018). Lack of competencies among dispensers, unwillingness to share information, and lack of proper knowledge could be significant factors for precipitating shorter dispensing time (Saqib *et al.*, 2018). The percent of medications dispensed was found to be 100% which is similar to Cambodia 100% (Chareonkul *et al.*, 2002). and Saudi Arabia 99.6% (El Mahalli, 2012). The findings from our study are higher compared to that reported in

Ethiopia 83.4% (Angamo *et al.*, 2011). The major reason behind the lower percentage of dispensed drugs might be the inadequate availability of the drugs. The percentage of drug labeling practice was found to be 61.94% for our study. In Saudi Arabia (El Mahalli, 2012), the percentage of drugs labeled was 10.0% whereas 0.0% in Ethiopia (Angamo *et al.*, 2011) and Cambodia (Chareonkul *et al.*, 2002).

According to our findings, patient knowledge of the correct dose was 43.3%, which was found to be relatively lower than for other countries like Saudi Arabia 79.3% (El Mahalli, 2012), Ethiopia 94.0% (Angamo *et al.*, 2011), and Tanzania 96.1% (Massele *et al.*, 2001). Lack of knowledge of correct doses of the drug directly resembles the consultation time, dispensing time, and adequate labeling.

CONCLUSION

A higher number of drugs are prescribed per prescription to obstructive lung disease patients. Generic prescribing was less practiced with higher antibiotic encounters. Evidence of lower consultation time in a pharmacy and a lower number of adequately labeled drugs was determined. Furthermore, the patient's knowledge of the correct dosage was low. Therefore, more similar studies are required in the future to determine the appropriate interventions for the improvement of overall drug prescribing, dispensing, and use patterns in obstructive lung disease patients.

CONFLICT OF INTEREST

None

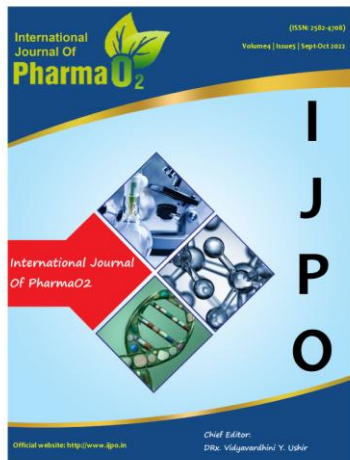
ACKNOWLEDGEMENTS

The author sincere appreciation to the Islamic Development Bank (IsDB) Jeddah, Kingdom of Saudi Arabia for PhD scholarship.

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