Prescription Pattern of Drugs Used for Respiratory Diseases in a Tertiary Care Teaching Hospital

Shiv Kumar*, Nasreen Sultana, Mudgal Shankarappa, H Doddayya

Department of Pharmacy Practice, N.E.T. Pharmacy College. Raichur, India.

ABSTRACT

Respiratory diseases significantly contribute to global morbidity and mortality, particularly in developing countries. Chronic respiratory diseases (CRDs) like COPD and acute lower respiratory tract infections are major contributors. Irrational medication use exacerbates these conditions, leading to unsafe treatments and economic burdens. This study aims to evaluate and optimize prescription practices for respiratory disease management. **Methodology**: A prospective observational study was conducted over three months at Navodaya Medical College Hospital, Raichur. Data from 70 patients in General and Respiratory Medicine were analyzed using Excel for graphs and tables. **Results**: Of 70 patients, 52.85% were male, and most were older adults (27.1%). Infectious diseases (40%) and obstructive diseases (38.57%) were prevalent. The average drugs per prescription were 86.1%, with only 6.46% prescribed generically. Bronchodilators (45.23%) and corticosteroids (22.38%) were common, while oxygen therapy was underused (0.47%). IV routes dominated (44.46%), followed by oral (41.64%). Beta-lactam antibiotics (45%) and inhaled corticosteroids (61.70%) were preferred. **Conclusion**: Prescription patterns showed reliance on bronchodilators and corticosteroids but revealed polypharmacy risks and cost concerns due to brand-name drugs. Excessive injection use and moderate adherence to the WHO essential drug list highlight the need for improved practices to enhance safety, efficacy, and cost-effectiveness.

Keywords: Respiratory Diseases, Prescribing Patterns, Rational Drug Use, WHO Prescribing Indicators.

INTRODUCTION

Acute and chronic respiratory diseases contribute to significant morbidity and mortality across the world, more so in the developing countries. The global burden of disease (GBD) reports have highlighted a high burden of chronic respiratory diseases (CRDs) in India. [1]

These conditions range from airway disease, lung infections, malignancies, interstitial diseases, pulmonary vascular diseases as well as pleural and sleep abnormalities. Overall, approximately a sixth of the world's population suffers from acute or chronic respiratory conditions. Also, respiratory illnesses make up a sixth of the thirty most common causes of mortality globally with chronic obstructive pulmonary disease (COPD) being the third and acute lower respiratory tract infections (LRTI) the fourth. Furthermore, the impact of respiratory diseases accounts for over 10% of all disability-adjusted life years, coming closely behind cardiovascular diseases including stroke.[2]   Risk factors for chronic respiratory diseases are common: at least 2 billion people are exposed to the toxic effects of biomass fuel use, 1 billion are exposed to outdoor air pollution, and 1 billion are smokers who expose a near-equal magnitude of people to the ill-effects of second-hand smoke. Each year, it is estimated that 4 million people die prematurely from chronic respiratory diseases. Although occupational respiratory conditions are a well characterised risk factor, their magnitude is ill-defined; on the basis of the few analyses that exist, around 2 million work-related deaths annually are estimated to occur because of work-related exposures relevant to respiratory conditions.[3]

An audit of prescribing patterns is an important indicator of the quality and standard of clinical practice. The study of prescribing patterns is a part of medical audit and seeks to monitor, evaluate and, if necessary, suggest modifications in prescribing practices to make medical care rational.[4]

Prescription of medicines is a crucial component of patient care. Rational use of drugs has become an important public health issue because of inappropriate drug prescribing. Worldwide, >50% of all medicines are prescribed, dispensed, or sold improperly and 50% of patients fail to take them properly. The rationality of prescribing pattern is of utmost importance because bad prescribing

habits, including misuse, overuse and under use of medicines can lead to unsafe treatment, exacerbation of the disease, health hazards, and economic burden on the patients and waste of resources. Examples of irrational use of medicines include: poly-pharmacy, inadequate dosage, and use of antimicrobials even for non-bacterial infections, excessive use of injections when oral forms are available and inappropriate, self-medication and non-compliance to dosing regimes. Prescribing indicators include the average number of drugs per encounter, the percentage of encounters in which antibiotics are prescribed, the percentage of encounters in which an injection is prescribed, the percentage of drugs prescribed by generic names, and the percentage of drugs prescribed from and essential drug list or formulary.[5]

Study Purpose

This study aims to analyze prescribing patterns for respiratory diseases, identifying areas for improvement to promote rational and cost-effective care.

MATERIALS AND METHODS

A Prospective observational study was conducted over 3 months at Navodaya medical college hospital and research centre, Raichur. Data were collected from a total of 70 patients from General Medicine and Respiratory Medicine. The collected data were then analyzed using various tools. Excel sheets were used to tabulate the data, which was subsequently utilized to generate relevant graphs and tables.

RESULTS

A prospective observational study was carried out with 70 participants from General Medicine and Respiratory Medicine of a tertiary care teaching hospital. The results were calculated after analyzing all the collected data.

Table 1: Distribution based on gender (n=70)

Gender	No of Participants	Percentage(%)
Male	37	52.85
Female	33	47.14

In a study analyzing of 70 patients, majority of them were males 37 accounting for 52.85% females 33 accounting for (47.14%). This is depicted in table 1.

Table 2: Age distribution of patients (n=70)

Age	No of Prescriptions	Percentage(%)
18 - 27	5	7.1
28 - 37	11	15.7
38 - 47	11	15.7
48 - 57	11	15.7
58 - 67	19	27.1
68 - 77	9	12.8
> 77	4	5.714285714

The results of the present study are based on the data of 70 patients. The majority were of old age (58-67 years), comprising 27.1%, while the smallest group was aged 18-27 years, comprising 7.1%. This is depicted in table 2.

Table 3: Distribution of cases on the basis of Diagnosis of patients (n=70)

Conditions	No. of Cases	Percentage
Obstructive Lung Diseases	27	38.57142857
Infectious Diseases	28	40
Structural Lung Diseas	7	10
Pleural Disease	8	11.42857143

The study presents the details of commonly diagnosed diseases among the enrolled patients. The majority were diagnosed with infectious diseases, accounting for 40% of the total cases, followed by obstructive diseases at 38.57%. The least frequently diagnosed condition was structural lung disease, comprising 10% of the cases. This is depicted in table 3.

Table 4: Analysis of prescriptions in light of WHO prescribing indicators (n=603)

Sl.NO	Prescribing Indicators Assessed	Percentage
1	Average number of drugs per prescription	86.10%
2	Percentage of drugs prescribed by generic name	6.46%
3	Percentage of injections prescribed	36.65%
4	Percentage of antibiotics prescribed	25.70%
5	Percentage of drugs prescribed by essential drug list	64.50%

The study reports the data according to WHO prescribing indicators: The average number of drugs per prescription is 86.1%. The percentage of drugs prescribed by generic name is 6.46%, the percentage of injections prescribed is 36.65%, the percentage of antibiotics prescribed is 25.70%, and the percentage of drugs prescribed from the essential drug list is 64.5%. This is depicted in table 4.

Table 5: Distribution based on different class of drugs (n=210)

Class of drugs	No. of Drugs	Percentage
Bronchodialators	95	45.23
Corticosteroids	47	22.38
Mucolytics	25	11.9
Antihistamines	21	10
Oxygen Inhalation	1	0.47
Leukotriene antagonists	18	8.57
Antitussives	3	1.42

The study describes the commonly prescribed drug classes for managing respiratory diseases. Bronchodilators were the most frequently prescribed at 45.23%, followed by corticosteroids at 22.38%. The least prescribed drug class was oxygen inhalation therapy at 0.47%. This is depicted in table 5.

Table 6: Distribution based on route of administration (n=497)

Route of adminisration	No Of Drugs	Percentage
IV	221	44.46
Oral	207	41.64
Nebulizers	68	13.68
Topical	1	0.20

The study shows that the IV route of administration was the most commonly used at 44.46%, followed by the oral route at 41.64%. The least used was the topical route, at 0.20%. This is depicted in table 6.

Table 7: Distribution of prescribed Antibiotics (n=155)

Different Classes of Drugs	No Of Drugs	Percentage
Beta lactum antibiotics	71	45.80
Macrolide antibiotics	37	23.87
Fluoroquinolons	11	7.09
Aminoglycosides	5	3.22
Lincosamide Antibiotics	1	0.64
Tetracyclines	2	1.29
Nitroimidazole	4	2.58
ATT drugs	24	15.48

The study describes the distribution of prescribed antibiotics. Beta-lactam antibiotics were the most frequently prescribed at 45%, followed by macrolide antibiotics at 23.87%. The least prescribed drug class was lincosamide antibiotics at 0.64%. This is depicted in table 7.

Table 8: Distribution of prescribed Bronchodilators (n=30)

Bronchodialators	No. of Drugs	Percentage
Betasympathomimetics	13	43.33
Anticholinergics	13	43.33
Methylxanthines	4	13.33

The study describes the distribution of prescribed bronchodilators. Betasympathomimetics and anticholinergics were the most frequently prescribed at 43.33%, while methylxanthines were the least prescribed drug class at 13.33%. This is depicted in table 8.

Table 9: Distribution of prescribed Corticosteroids (n=30)

Corticosreroids	No. of Drugs	Percentage
Inhaled Corticosteroids	29	61.70
Systemic Corticosteroids	18	38.29

The study shows the distribution of prescribed corticosteroids. Inhaled corticosteroids were the most frequently prescribed at 61.70%, followed by systemic corticosteroids at 38.29%. This is depicted in table 9.

DISCUSSION

The study analyzed data from 70 patients, revealing a slight predominance of males (52.85%) over females (47.14%), and highlighted the vulnerability of older adults to respiratory diseases, with the majority falling in the 58-67 age group (27.1%). Younger patients (18-27 years) constituted the smallest age group, representing just 7.1%. The diagnosis patterns indicated that infectious diseases were the most prevalent, accounting for 40% of cases, followed closely by obstructive diseases such as asthma and COPD (38.57%). Structural lung diseases were less common, comprising only 10% of diagnoses, suggesting that the study population was more affected by conditions that involve airflow obstruction and infections.

In terms of prescribing practices, the study applied WHO prescribing indicators and found that the average number of drugs per prescription was high at 86.1%, raising concerns about potential polypharmacy. Despite the availability of cost-effective alternatives, only 6.46% of drugs were prescribed by their generic names, indicating a preference for brand-name medications. Injections were relatively common, prescribed in 36.65% of cases, reflecting a possible reliance on parenteral administration for acute conditions. Antibiotics were prescribed in 25.70% of cases, consistent with the high prevalence of infectious diseases. Additionally, 64.5% of the prescribed drugs were from the essential drug list, suggesting a moderate adherence to guidelines aimed at ensuring the use of necessary and evidence-based medications. The study also detailed the use of specific drug classes for managing respiratory conditions, with bronchodilators being the most frequently prescribed (45.23%), indicative of their central role in treating obstructive diseases. Corticosteroids, crucial for reducing inflammation, were the second most prescribed class (22.38%), while oxygen inhalation therapy was the least utilized (0.47%), likely reflecting its use in more severe cases or its limited availability. The IV route was the most commonly used method of administration (44.46%), often preferred for its rapid action in acute settings, followed closely by the oral route (41.64%). Topical administration was rare (0.20%), underscoring its limited role in respiratory care. Beta-lactam antibiotics were the predominant choice for treating bacterial infections (45%), and there was a clear preference for inhaled corticosteroids (61.70%) over systemic ones (38.29%), aligning with the aim to minimize systemic side effects while effectively managing chronic respiratory conditions.

The study revealed a high reliance on bronchodilators and corticosteroids for respiratory disease management. However, the excessive number of drugs per prescription and the low rate of generic prescriptions are concerning, as they increase costs and the risk of adverse effects.

CONCLUSION

The study highlights the vulnerability of older adults to respiratory diseases, with infectious and obstructive conditions being the most prevalent. It reveals concerning prescribing practices, such as a high average number of drugs per prescription (86.1%) and a low rate of generic prescribing (6.46%), raising concerns about polypharmacy and cost-effectiveness. While 64.5% of drugs adhered to the essential medicines list, parenteral routes and antibiotics were common, reflecting acute management needs. Bronchodilators and inhaled corticosteroids dominated prescriptions, emphasizing their importance in treating obstructive diseases. The findings underscore the need for improved prescribing practices and enhanced adherence to evidence-based respiratory care guidelines.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

REFERENCES:

1. Sharma BB, Singh S, Sharma KK, Sharma AK, Suraj KP, Mahmood T, et al. Proportionate clinical burden of respiratory diseases in Indian outdoor services and its relationship with seasonal transitions and risk factors: The results of the SWORD survey. PLoS One [Internet]. 2022;17(8):e0268216. Available from: http://dx.doi.org/10.1371/journal.pone.0268216

2. Ojuawo OB, Desalu OO, Aladesanmi AO, Opeyemi CM, Azeez AT, Fawibe AE, et al. Outpatient burden of adult respiratory diseases in University of Ilorin Teaching Hospital, Nigeria. Niger J Clin Pract [Internet]. 2022;25(8):1233–8.
Available from: http://dx.doi.org/10.4103/njcp.njcp_1864_21

3. Soriano JB, Kendrick PJ, Paulson KR, Gupta V, Abrams EM, Adedoyin RA, et al. Prevalence and attributable health burden of chronic respiratory diseases, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet Respir Med [Internet]. 2020 [cited 2024 May 26];8(6):585–96. Available from: https://pubmed.ncbi.nlm.nih.gov/32526187/

4. Beg MA, Dutta SB, Bawa S, Kaur A, Vishal S, Kumar U. Prescribing trends in respiratory tract infections in a tertiary care teaching hospital. Int J Res Med Sci [Internet]. 2017;5(6):2588. Available from: http://dx.doi.org/10.18203/2320-6012.ijrms20172452

5. Singh P, Tandon S, Chaturvedi JN, Singh B, Tiwari RN, Kashyap S, Patel AK. Assessmentt of Prescribing Pattern and Drug Use in Outpatient Department of Pulmonary Medicine at District General Hospital of Central India. International Journal of Pharmaceutical and Clinical Research 2024; 16(2); 1468-1475

How to cite this article:
Shiv Kumar et.al. Ijppr.Human, 2024; Vol. 30 (11): 317-322
Conflict of Interest Statement: All authors have nothing else to disclose.
This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.