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Assessment of Risk Factors, Clinical Types, Stages, and Prescribing Patterns in Hospitalized Patients with COPD

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ABSTRACT:

Background: Chronic obstructive pulmonary disease (COPD) is a common and treatable disease characterized by progressive airflow limitation and tissue destruction. **Aim:** The study aimed to assess risk factors, clinical types, stages, and prescribing patterns among COPD patients. **Methods:** The prospective observational study was carried out for a period of 6 months. The study was conducted in General medicine department in a tertiary care hospital. A written and informed consent was obtained from the recruited patients. A Total of 225 patients were enrolled in the study. **Results:** In our study 37-46 years age patients were more 62 (27.55%) compared to other ages. In our study male patients were more 147(65.33 %), compared to female patients were 78 (34.66 %). Inhalational route of administration of drugs were more 138(61.33%) compared to other Route of administration of drugs. Drug therapy for COPD includes Triple therapy patients were more 104 (46.22%) compared to other drug therapies. Antibiotic therapy for COPD includes Aminoglycosides prescribed patients were more 67(29.77%) compared to other antibiotic therapies. Drug prescribing pattern for COPD management includes Theophylline prescribed drugs patients were more 52(23.11%) compared to other prescribed drugs. **Conclusion:** The study suggests that improving medication adherence among individuals with COPD can brings out enhanced patient outcomes by providing effective counseling may help to reduce the burden of COPD.

Keywords: COPD, Airflow limitation, Medication adherence, Effective counseling, Antibiotic therapy.

1. Introduction

Chronic obstructive pulmonary disease (COPD) is a common and treatable disease characterized by progressive airflow limitation and tissue destruction. It is associated with structural lung changes due to chronic inflammation from prolonged exposure to noxious particles or gases most commonly cigarette smoke. Chronic inflammation causes airway narrowing and decreased lung recoil. The disease often presents with symptoms of cough, dyspnea, and sputum production. Symptoms can range from being asymptomatic to respiratory failure. Chronic obstructive pulmonary disease (COPD) is a poorly reversible disease of the lungs that is one of the major causes of morbidity and mortality worldwide. In the United States, it is the fourth leading cause of death after heart disease, cancer, and cerebrovascular disease. By 2020, it is projected to become the third leading cause of death worldwide. COPD is primarily present in smokers and those greater than age 40. Prevalence increases with age and it is currently the third most common cause of morbidity and mortality worldwide. In 2015, the prevalence of COPD was 174 million and there were approximately 3.2 million deaths due to COPD worldwide. However, the prevalence is likely to be underestimated due to the under diagnosis of COPD. The principal feature of COPD is limitation of airflow that is not fully reversible¹⁻². Remodelling of the small-airway compartment and loss of elastic recoil by emphysematous destruction of parenchyma result in progressive decline of FEV₁, inadequate lung emptying on expiration, and subsequent static and dynamic hyperinflation. At the pathological level, exposure to smoke leads to infiltration of the

mucosa, submucosa, and glandular tissue by inflammatory cells. COPD treatment focuses on relieving symptoms, reducing flare-ups (exacerbations), improving quality of life, primarily using inhaled medications. Key therapies include bronchodilators to open airways, inhaled steroids to reduce inflammation, and combination inhalers. Medications are generally categorized into short-acting rescue inhalers and long-acting maintenance treatments. Non-drug treatments for COPD (chronic obstructive pulmonary disease) focus on improving quality of life, increasing physical ability, and reducing symptoms through lifestyle changes. Key interventions include quitting smoking, pulmonary rehabilitation, exercise training, breathing techniques (like pursed-lip breathing), nutritional support, vaccinations³⁻⁴.

2. Methodology

The prospective observational study was carried out for a period of 6 months. The study was conducted in General medicine department in a tertiary care hospital. A written and informed consent was obtained from the recruited patients. A Total of 225 patients were enrolled in the study.

Study Design: It was Prospective observational study.

Study Period: The Present study was conducted for a period of six months.

Study site: The Present study was conducted in General medicine department in a tertiary care hospital.

Sample size: It was 225 Patients.

Inclusion criteria

- Patients with age of more than 18 years.

- Patients who are willing to give consent.
- Patients of either sex, diagnosed with COPD.
- Patients receiving treatment for COPD.
- Patients with clinical risk factors of COPD.

Exclusion criteria

- Patients below 18 years.
- Patients who were not willing to join in the study.
- Special population including pregnant women and lactating women.
- Psychiatric abnormalities.

Institutional ethics committee (IEC) consideration:

The research protocol was submitted to ethical committee and ethical Committee was permitted to perform the research work in the selected department of a tertiary care hospital.

Patient data collection and management: The data collection form contains information regarding age, sex, diagnosis, past medical history, medication history, laboratory data, and diagnosis, dose, frequency of administration and duration of therapy was collected from the patients treatment chart.

Statistical analysis: The data was represented as percentages. The $P < 0.05$ was considered to indicate a statistically significant difference.

3. Results

Table 1: Age wise distribution

Age	Total (N=225)	Percentage (%)
25-30	35	15.55
31-36	45	20
37-46	62	27.55
47-55	83	36.88
Total	225	

Table 2: Gender

Gender	Total (N=225)	Percentage (%)
Male	147	65.33
Female	78	34.66
Total	225	

Table 3: Type of patients

Type of patients	Total (N=225)	Percentage (%)
IP	94	41.77
OP	131	58.22
Total	225	

Table 4: Stage of COPD

Education	Total (N=225)	Percentage (%)
Stage I (Mild)	46	20.44
Stage II (Moderate)	45	20
Stage III (Severe)	75	33.33
Stage IV (Very Severe)	59	26.22
Total	225	

Table 5: BMI

BMI	Total (N=225)	Percentage (%)
Normal weight	47	20.88
Over weight	48	21.33
Under weight	77	34.22
Grade I obesity	53	23.55
Total	225	

Table 6: Duration of Hospital stay

Duration of Hospital stay	Total (N=225)	Percentage (%)
1--5 days	76	33.77
6--10 days	91	40.44
11--15 days	58	25.77
Total	225	

Table 7: Classification of Smoking status

Smoking status	Total (N=225)	Percentage (%)
Smoker	86	38.22
Ex smoker	74	32.88
Non smoker	65	28.88
Total	225	

Table 8: Route of administration of drugs

Route of administration	Total (N=225)	Percentage (%)
Inhalational	138	61.33
Oral	87	38.66
Injection	97	43.11
Total	225	

Table 9: Classification of Risk factors

Classification of Risk factors	Total (N=225)	Percentage (%)
Exposure to smoke	31	137.77
Pulmonary tuberculosis	56	24.88
Asthma	43	19.11
Occupational factors	95	42.22
Total	225	

Table 10: Comorbidities

Comorbidities	Total (N=225)	Percentage (%)
Hepatitis	36	16
Anemia	51	22.66
Hypertension	54	24
Diabetes mellitus	25	11.11
Hypothyroidism	59	26.22
Total	225	

Table 11: Drug therapy for COPD

Drug therapy	Total (N=225)	Percentage (%)
Mono therapy	34	15.11
Double therapy	87	38.66
Triple therapy	104	46.22
Total	225	

Table 12: Antibiotic therapy for COPD

Antibiotic therapy for COPD	Total (N=225)	Percentage (%)
Cephalosporins	34	15.11
Macrolides	24	10.66
Aminoglycosides	67	29.77
Tetracyclines	44	19.55
Quinolones	56	24.88
Total	225	

Table 13: Lab test for COPD

Lab test	Total (N=225)	Percentage (%)
ECG	28	12.44
Blood test	65	28.88
Thyroid test	43	19.11
Pulmonary function test	89	39.55
Total	225	

Table 14: Drug prescribing pattern for COPD management

Prescribed drugs	Total (N=225)	Percentage (%)
Hydrocortisone	35	15.55
Doxycycline	21	9.33
Montelukast	30	13.33
Amoxicillin	45	20
Theophylline	52	23.11
Salbutamol	42	18.66
Total	225	

Table 15: WHO Drug prescribing indicators

WHO Prescribing indicators	
Total number of patient's prescription analyzed	225
Total number of drugs prescribed	225*8=1800

Average number of drugs per prescription	8
Number of drugs prescribed by Generic name	225
Number of drugs prescribed by Brand name	1575
Drugs included in National list of essential medicines	215

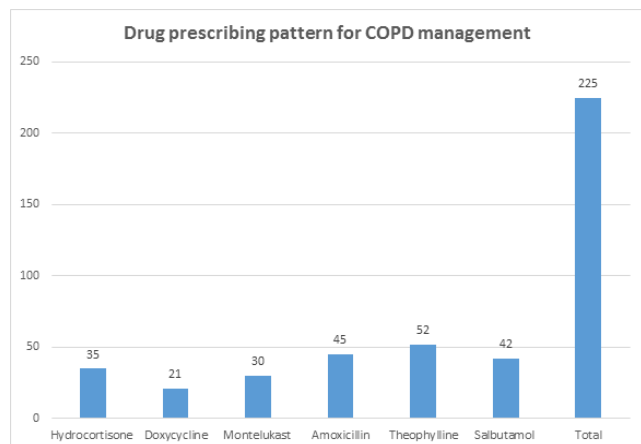


Figure 1: Drug prescribing pattern for COPD management

4. Discussion

1. In our study 37-46 years age patients were more 62 (27.55%) compared to other ages.
2. In our study male patients were more 147(65.33 %), compared to female patients were 78 (34.66 %).
3. In our study OP patients were more 131 (58.22%) compared to IP patients were 94 (41.77 %).
4. In our study Stage III (Severe) patients were more 75(33.33%) compared to other COPD stages.
5. In our study Underweight patients were more 7(34.22%), compared to other BMI categories.
6. In our study 6--10 days duration patients were more 91(40.44%) compared to other Duration of Hospital stay patients⁵⁻⁶.
7. In our study Ex-smoker patients were 74(32.88%) compared to other Smoking status.
8. Inhalational route of administration of drugs weremore138(61.33%) compared to other Route of administration of drugs⁷⁻⁹.
9. Classification of Risk factors includes Occupational factors patients were more 95(42.22%) compared to other risk factors.
10. Comorbidities Hypothyroidism patients were more 59 (26.22%) compared to other Comorbidities¹⁰⁻¹¹.
11. Drug therapy for COPD includes Triple therapy patients were more 104 (46.22%) compared to other drug therapies¹².
12. Antibiotic therapy for COPD includes Aminoglycosides prescribed patients were more 67(29.77%) compared to other antibiotic therapies¹³.
13. Lab test for COPD includes Pulmonary function test patients were more 89(39.55%) compared to other lab test.
14. Drug prescribing pattern for COPD management includes Theophylline prescribed drugs patients were more 52(23.11%) compared to other prescribed drugs.
15. WHO Drug prescribing indicators includes Total number of patient's prescription analyzed were 225, Total number of drugs prescribed were 1800, Average

number of drugs per prescription were 8.0, Number of drugs prescribed by Generic name was 225.

16. Number of drugs prescribed by Brand name was 1575, Drugs included in National list of essential medicines was 215.

5. Conclusion

Our study also showed that prescription of generic drugs was very low and it represents financial burden of patients¹⁴. Our study large proportion of patients having smoking so a separate smoking cessation counselling may help to lower the COPD infection. The study suggests that improving medication adherence among individuals with COPD can brings out enhanced patient outcomes by providing effective counseling may help to reduce the burden of COPD. The General physicians should follow traditional forms of treatment as per the updated treatment guidelines.

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AI Tool Declaration

The authors declare that no AI and related tools are used to write the scientific content of this manuscript.

Conflict of Interests

The authors declare no conflict of interest

Ethics Approval

Not applicable

Data Availability

Data will be available on request

6. References

- [1] Curtis JL, Freeman CM, Hogg JC. The immunopathogenesis of chronic obstructive pulmonary disease: insights from recent research. *Proc Am ThoracSoc* 2007;4(7):512-521.
- [2] Hogg JC, Timens W. The pathology of chronic obstructive pulmonary disease. *Annu Rev Pathol* 2009;4:435-459.
- [3] Tudor RM, Petrache I. Pathogenesis of chronic obstructive pulmonary disease. *J Clin Invest* 2012;122(8):2749-2755.
- [4] Agustí A, Hogg JC. Update on the pathogenesis of chronic obstructive pulmonary disease. *N Engl J Med* 2019;381(13):1248-1256.
- [5] Labonte LE, Tan WC, Li PZ, Mancino P, Aaron SD, Benedetti A, et al. ; CanCOLD Collaborative Research Group. Undiagnosed chronic obstructive pulmonary disease contributes to the burden of health care use.

- Data from the CanCOLD Study. *Am J RespirCrit Care Med* 2016;194(3):285-298.
- [6] Ho T, Cusack RP, Chaudhary N, Satia I, Kurmi OP. Under- and over-diagnosis of COPD: a global perspective. *Breathe (Sheff)* 2019;15(1):24-35.
- [7] Kohansal R, Martinez-Camblor P, Agusti A, Buist AS, Mannino DM, Soriano JB. The natural history of chronic airflow obstruction revisited: an analysis of the Framingham offspring cohort. *Am J RespirCrit Care Med* 2009;180(1):3-10.
- [8] Fletcher C, Peto R. The natural history of chronic airflow obstruction. *Br Med J* 1977;1(6077):1645-1648.
- [9] Lange P, Celli B, Agusti A, Boje Jensen G, Divo M, Faner R, et al. Lung-function trajectories leading to chronic obstructive pulmonary disease. *N Engl J Med* 2015; 373(2): 111-122.
- [10] Allinson JP, Hardy R, Donaldson GC, Shaheen SO, Kuh D, Wedzicha JA. Combined impact of smoking and early life exposures on adult lung function trajectories. *Am J RespirCrit Care Med* 2017;196(8):1021-1030.
- [11] Yang IA, Jenkins CR, Salvi SS. Chronic obstructive pulmonary disease in never smokers: risk factors, pathogenesis, and implications for prevention and treatment. *Lancet Respir Med* 2022;10(5):497-511.
- [12] Raju S, Keet CA, Paulin LM, Matsui EC, Peng RD, Hansel NN, et al. Rural residence and poverty are independent risk factors for chronic obstructive pulmonary disease in the United States. *Am J RespirCrit Care Med* 2019;199(8):961-969.
- [13] MacNee W, Tudor RM. New paradigms in the pathogenesis of chronic obstructive pulmonary disease I. *Proc Am Thorac Soc.* 2009;6:527–531.
- [14] Feghali-Bostwick CA, Gadgil AS, Otterbein LE, Pilewski JM, Stoner MW, Csizmadia E, et al. Autoantibodies in patients with chronic obstructive pulmonary disease. *Am J RespirCrit Care Med* 2008; 177(2): 156-163.