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A Comprehensive Investigation into Chronic Respiratory Conditions with Specific Emphasis on Individuals Suffering from Bronchial Asthma and Copd

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ABSTRACT:
BACKGROUND Chronic Obstructive Pulmonary Disease (COPD) and Bronchial Asthma (BA) are prevalent respiratory illnesses. COPD leads to irreversible airflow limitation, while asthma involves reversible airway obstruction from inflammation. Both conditions greatly affect quality of life and healthcare resources. This study evaluates the prevalence, clinical features, risk factors, and treatment strategies for asthma and COPD patients in a tertiary care hospital.
METHODS Over a captivating six-month period, a prospective observational study was conducted at the esteemed Government Medical College and Hospital in Nagapattinam.
RESULTS Among 100 patients, 71 had COPD and 29 had asthma. Most COPD cases were male (72%), while asthma was more prevalent in females (62%). Common symptoms included wheezing and breathlessness, with hypertension as the leading co-morbidity. Bronchodilators were mainly prescribed for COPD, while asthma management focused on corticosteroids and antibiotics. Combination inhalers were more frequently given to COPD patients than to those with asthma.
CONCLUSION COPD and asthma significantly affect patient well-being. The study emphasizes the need for personalized pharmacological management and the potential role of clinical pharmacists in enhancing treatment outcomes.

KEYWORDS: COPD, Bronchial Asthma, Pharmacological Management, Bronchodilators, Inhaled Corticosteroids

INTRODUCTION

Chronic respiratory diseases (CRDs) are among the leading causes of morbidity and mortality worldwide, posing a serious challenge to public health systems [1]. Among these, Chronic Obstructive Pulmonary Disease (COPD) and Bronchial Asthma are the most prevalent and clinically significant conditions [2]. These diseases affect individuals across all age groups, leading to impaired lung function, reduced quality of life, and significant healthcare expenditures [1,2]. Despite advances in medical science, the prevalence

and impact of COPD and asthma continue to rise, especially in low- and middle-income countries, including India [5,6].

COPD is a progressive respiratory disorder characterized by chronic airflow limitation that is not fully reversible. It encompasses emphysema and chronic bronchitis and is mainly associated with long-term exposure to harmful particles and gases, with tobacco smoking being the primary risk factor [3]. Other contributory factors include occupational dust and chemical exposure, air pollution, and genetic predisposition such as alpha-1 antitrypsin deficiency [1,5]. Unlike COPD, Bronchial Asthma is a chronic inflammatory disease of the airways, marked by recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, often triggered by environmental allergens, infections, or physical exercise [4]. Asthma differs from COPD in its typically reversible airflow limitation and earlier age of onset [4].

The World Health Organization (WHO) and Global Initiative for Chronic Obstructive Lung Disease (GOLD) recognize COPD as a significant cause of death and disability [2,3], while the Global Initiative for Asthma (GINA) emphasizes the growing burden of asthma globally [4]. Together, these reports highlight the need for better disease awareness, early diagnosis, and consistent treatment strategies [2–4].

In India, the situation is further complicated by environmental pollution, widespread biomass fuel usage in rural areas, occupational exposures, and the lack of widespread health education [5,6]. Although therapeutic interventions such as bronchodilators, inhaled corticosteroids, and combination inhaler therapies are readily available [7,8], access to healthcare services and adherence to treatment regimens remain significant challenges, particularly in resource-limited settings [5].

Recent research has emphasized the role of clinical pharmacists in improving the management of COPD and asthma [9,10]. Through medication counselling, inhaler technique training, adherence monitoring, pharmacovigilance, and early identification of drug-related problems, pharmacists have been shown to contribute significantly to better disease control and improved patient outcomes [9,10]. However, the pharmacist's role in respiratory care is not fully established in many parts of India, necessitating greater integration of pharmacy services into multidisciplinary healthcare teams [9].

Analysing prescribing patterns helps in understanding physician practices, patient preferences, and adherence to treatment guidelines [6,9]. It also sheds light on potential gaps in current practices, enabling targeted interventions. Furthermore, evaluating co-morbidities such as hypertension, cardiovascular disease, and diabetes among patients with respiratory diseases is important for comprehensive patient management [7].

Given these factors, this study was undertaken to investigate the clinical presentation, risk factors, co-morbidities, and prescribing patterns among patients diagnosed with COPD and asthma at a tertiary care hospital. By identifying current trends and challenges, this research aims to provide valuable insights into improving chronic respiratory disease management and highlights the critical role of clinical pharmacists in enhancing therapeutic outcomes and patient care.

MATERIALS AND METHODS

Study Design: This study was conducted as a prospective observational investigation over a period of six months, from 2023 to 2024, at the Government Medical College and Hospital, Nagapattinam, Tamil Nadu. The study focused on evaluating patients diagnosed with either Chronic Obstructive Pulmonary Disease (COPD) or Bronchial Asthma, aiming to analyse their clinical profiles and current treatment regimens.

Study Population and Sample Size: A total of 100 patients were enrolled based on their confirmed diagnosis of COPD or asthma. The sample consisted of both male and female patients admitted to the gen

eral medicine ward during the study period**.**

Inclusion Criteria:

Patients aged 20 years and above.

Individuals with a clinical diagnosis of asthma or COPD.

Patients willing to participate and provide information for the study.

Exclusion Criteria:

Pregnant and lactating women.

Patients receiving treatment for tuberculosis, HIV, or cancer.

Those admitted to the Intensive Care Unit (ICU).

Data Collection Tools:

Information was collected using a pre-designed patient profile form, which included sections for demographics (age, gender, occupation), social habits (smoking, alcohol), clinical symptoms, co-morbidities, and prescription details. Additional data were retrieved from patient medical records, case sheets, and medication charts.

Parameters Assessed:

The study focused on evaluating the following parameters:

Common presenting symptoms of asthma and COPD.

Associated co-morbid conditions.

Patterns of medication prescribed, including drug class, route of administration, and use of combination inhalers.

Patient habits such as smoking and alcohol use.

Statistical Analysis:

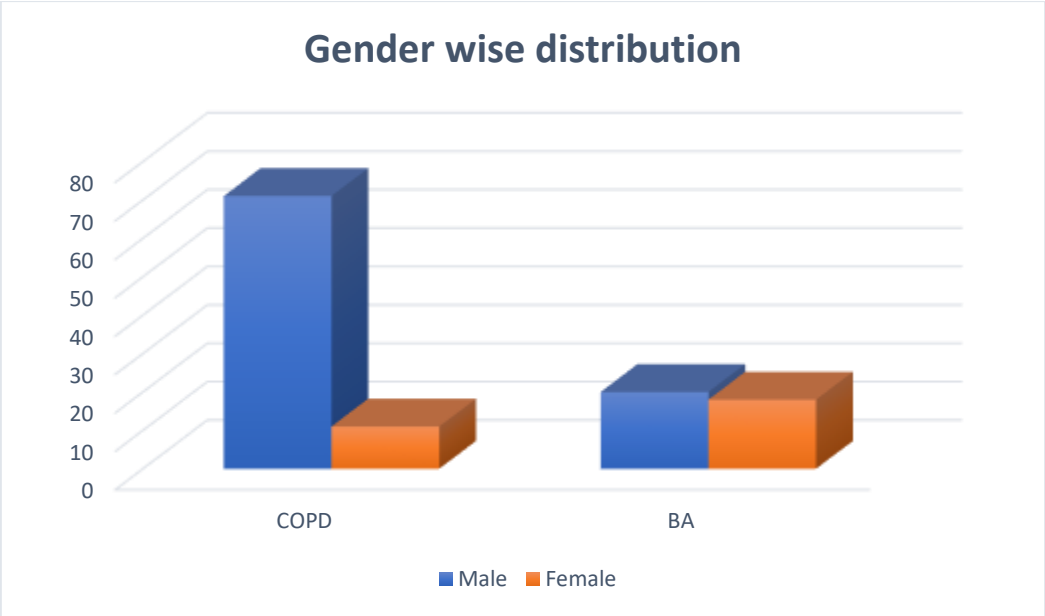
The collected data were processed and analyzed using IBM SPSS Statistics Version 29.0.1.0. Descriptive statistics were used to calculate frequency and percentage distributions. The Chi-square test was applied to assess statistical associations between patient variables such as gender, diagnosis, social habits, and drug usage patterns. A p-value < 0.05 was considered statistically significant.

RESULTS

The study involved 100 patients, of whom 71 were diagnosed with Chronic Obstructive Pulmonary Disease (COPD), comprising 72% male and 28% female participants. Additionally, 29 patients were identified with bronchial asthma, with a gender distribution of 62% female and 38% male. The statistical significance of the findings is illustrated in Table 1, which shows a p-value of 0.001 for COPD and 0.002 for bronchial asthma.

Table 1

GENDER	**NO.OF. PATIENTS IN COPD (n=71)**	COPD	**NO.OF. PATIENTS IN BA (n=29)**	BA
MALE	51(72%)	P = 0.001	11(37.9%)	P = 0.002
FEMALE	20(28.1%)		18(62.0%)	



Age wise distribution and Social Habits:

The age bracket that was most impacted by Chronic Obstructive Pulmonary Disease (COPD) was between 60 to 69 years, at 35.2%. The most impacted age group for asthma, however, was between the ages of 50 to 59, at 15.4%. There was also a significant variation in smoking history; half of the COPD patients had a history of smoking while only 13% of asthma patients had this history ($p < 0.05$). In addition, alcohol use was noted in 32% of patients, with greater frequency in the presence of COPD.

Table 2

SOCIAL HABITS							
RESPIRATORY CONDITIONS	Smokers	Ex-smokers	Non-smokers	Alcoholic	Ex – alcoholic	Non-alcoholic	
COPD	7	09	23	22	12	28	
BRONCHIAL ASTHMA	10	04	14	10	04	24	
TOTAL PERCENTAGE	50%	13%	37%	32%	16%	52%	
AGE WISE DISTRIBUTION							
	20-29	30-39	40-49	50-59	60-69	70-79	>80
COPD N=71	3(4.22%)	1(1.40%)	12(16.9%)	12(16.9%)	25(35.2%)	16(22.5%)	2(2.81%)
BRONCHIAL ASTHMA N=29	1(3.44%)	1(3.44%)	6(20.6%)	11(15.4%)	5(17.2%)	3(10.3%)	2(6.89%)

Clinical Presentation:

The most notable symptoms shared in the two disorders were wheezing, which occurred in an impressive 95.7% of patients with COPD and 96.5% of those with asthma, and breathlessness, which occurred in 77.4% of COPD patients and 75.8% of asthma patients. In addition, a range of other symptoms was commonly found, including cough (reported by 53.5% of the COPD patients and 51.7% of the asthma patients), along with headache, tiredness, and palpitations. This suggests
the multifaceted and complex character of these respiratory illnesses.

Table 3

SIGNS AND SYMPTOMS	COPD PATIENTS (n=71)	PERCENTAGE (%)	ASTHMA PATIENTS (n=29)	PERCENTAGE (%)
wheezing	68	95.7%	28	96.5%
breathlessness	55	77.4%	22	75.8%
Cough and cold	38	53.5%	15	51.7%
Abdomen pain	30	42.2%	8	27.5%
Chest pain	24	33.8%	7	24.1%
Vomiting	20	28.1%	11	37.9%
Headache	18	25.3%	12	41.3%
Fatigue	14	19.7%	12	41.35%
Palpitation	13	18.3%	9	31.1%
Giddiness	11	15.4%	9	31.0%
Nausea	9	12.6%	10	34.4%
Heart burn	7	9.8%	5	17.2%
MOST COMMON SIGN AND SYMPTOMS OF COPD AND ASTHMA				
SIGN & SYMPTOMS	**NO; OF PATIENTS IN COPD AND ASTHMA**		**P- VALUE**	
Wheezing	86		<.003	

Co-morbidities:

Fifty-two percent of the patients had a minimum of one co-morbidity, as shown by Table 4. The most common co-morbidity was systemic hypertension, seen in 34% of the cohort, followed by cardiovascular diseases in 20% and diabetes mellitus in 14%. Interestingly, among patients with chronic obstructive pulmonary disease (COPD) there was a higher incidence of coronary artery disease and diabetes, which occurred in 2% of this group compared to asthma patients. This information is further quantified in Table 5.

Table 4

Patient with co morbidity illness	52(52%)
Patient without co morbidity illness	45(45%)

Table 5		
DISEASE n=100	NO.OF. PATIENTS n=100	PERCENTAGE (%)
COPD only	27	27%
COPD+ systemic hypertension	20	20%
BA only	18	18%
BA+ systemic hypertension + diabetes	12	12%
COPD + cardiovascular disease	11	11%
BA+ cardiovascular disease	3	3%
COPD+ Diabetes	2	2%
COPD+ coronary artery disease + systemic hypertension	2	2%
COPD+ coronary artery disease	2	2%

Prescribing Patterns:

Among Chronic Obstructive Pulmonary Disease (COPD) treatment, bronchodilators were the most frequently prescribed drugs at 37% of prescription rates. They enhance breathing by relaxing muscles in the airways. Corticosteroids, used in 29% of prescriptions, combat inflammation, and antibiotics comprised 24% of prescriptions to treat bacterial infections that can complicate COPD.

In the treatment of asthma, corticosteroids and antibiotics accounted for 27% each, as corticosteroids are crucial in maintaining the control over inflammation and avoiding the attack. Anti-histamines were prescribed in 16% of conditions to treat the symptoms of allergy. For more information, see Table No. 6 and Table No. 7, which depict these patterns of prescriptions in COPD and asthma, respectively.

Table 5

CLASS OF DRUG n=366	**NO.OF. DRUGS n=366**	**PERCENTAGE (%)**
Bronchodilators	127	37%
Corticosteroids	99	29%
Antibiotic	83	24%
Anti-histamine	29	8%
Oxygen inhalation	25	7%
Mucolytics	3	1%

Combination Inhalers Usage:

Combination inhalers were utilized more in Chronic Obstructive Pulmonary Disease (COPD) patients at a level of 57% versus 30% among asthma patients. The most prescribed inhaler for COPD was Salbutamol with Ipratropium and Budesonide, which covered 49.1% of prescriptions. Meanwhile, Formoterol with Budesonide was more common among asthma patients, with a prescription rate of 30%.

Table 7

CLASS OF DRUGS n=267	NO.OF. DRUG n=267	PERCENTAGE (%)
Corticosteroids	73	27%
Anti-biotics	73	27%
Anti-histamines	42	16%
methylxanthines	25	10%
Beta agonist	25	9%
Oxygen inhalations	25	9%
Mucolytics	4	2%

Table 8

COMBINATION IN INHALER n= 77	COPD n=57	PERCENTAGE (%)	BRONCHIAL ASTHMA n=20	PERCENTAGE (%)
Salbutamol + Ipratropium (SABA) + (SAMA) + Budesonide (ICS)	28	49.1%	6	30%
Salbutamol + (SABA) Levosalbutamol + (SABA) Ipratropium bromide (SAMA)	21	36.8%	4	20%
Salbutamol + Budesonide (SABA) + (ICS)	6	10.5%	4	20%
Formoterol + budesonide (LABA) + (ICS)	2	3.5%	6	30%

Route of Administration of Corticosteroids:

Inhalation therapy is the major route of administration for corticosteroids in patients with chronic obstructive pulmonary disease (COPD) with a frequency of 55.1% and with asthma, 39.7%. The systemic corticosteroids are used more often in the treatment of asthma (48%) than COPD (37.1%), as can be seen from Table No.9.

Table 9

ROUTE OF ADMINISTRATION	COPD n=156	BRONCHIAL ASTHMA n=93
inhalation corticosteroids	58(55.1%)	38(39.7%)

Systemic corticosteroids	86(37.1%)	37(48%)
Oral corticosteroids	12(7.69%)	18(19.3%)

DISCUSSION

Our research identified that Chronic Obstructive Pulmonary Disease (COPD) occurred more frequently in men, whereas asthma occurred more often in women. This correlates with the findings of research carried out by Gupta et al., wherein a greater incidence of COPD was found in men on account of increased exposure to tobacco and occupational contaminants. In the case of women, asthma has been linked to hormonal and allergic exposures. [6]

For age pattern, COPD was most common in the 60-year and above age groups, while asthma was seen more often among 40-59-year-old patients. This is consistent with the findings of Salvi et al., where it was observed that COPD prevalence increases with age, and asthma usually presents earlier in life. [5]

Clinically, the most common symptoms reported in both groups were wheezing and breathlessness. These findings align with the GOLD and GINA guidelines, which list these as hallmark symptoms in both conditions [3,4]. Our study also observed that cough, fatigue, and chest tightness were frequently reported, corroborating the symptom profiles described in studies by Sharma et al. [9].

Regarding co-morbidities, systemic hypertension and cardiovascular diseases were more frequent in COPD patients. This is in line with studies by Prasad et al., who highlighted the impact of co-existing chronic conditions in respiratory patients and the need for integrated care approaches [23].

The drug utilization patterns showed that bronchodilators were the most prescribed agents in COPD, while corticosteroids and antibiotics were frequently used in asthma. This treatment approach is consistent with the recommendations of the GOLD and GINA strategies, which advocate individualized therapy based on disease severity and symptom control [3,4]. Similar findings were documented in prescribing audits conducted by Kumar et al. and Joy et al., who reported high reliance on inhaled therapies in both COPD and asthma [19,20].

Interestingly, the study found that combination inhalers were prescribed more often in COPD, especially triple drug combinations such as salbutamol + ipratropium + budesonide. This trend aligns with Jyothi et al., who observed a preference for multiple-agent inhaler therapy in patients with moderate-to-severe COPD [24]. In contrast, asthma patients received more dual inhaler combinations, reflecting a milder disease course in some cases [20].

A noteworthy observation was the widespread use of systemic corticosteroids, particularly during exacerbation episodes. This parallels findings from Naveed et al., who emphasized the need to balance therapeutic benefits with potential side effects, including hyperglycaemia, osteoporosis, and immune suppression [25].

The statistical association between smoking and COPD was found to be highly significant in our study, reaffirming the well-established role of smoking in the pathogenesis of COPD. These results are consistent with earlier reports by Jindal et al. and Mannino et al., both of whom reported strong correlations between tobacco use and airflow limitation [3,9].

Finally, this study underlines the valuable role of clinical pharmacists in managing chronic respiratory diseases. Pharmacist-led services such as inhaler technique education, medication adherence counselling, and adverse drug reaction monitoring were found to significantly influence patient compliance and therapeutic outcomes. Similar conclusions were drawn in studies by Sharma and Fletcher, who demonstrated improved outcomes in COPD and asthma patients receiving pharmacist intervention [9,10].

Although the findings offer valuable insights, the study does have certain limitations. Being a single-centre observational study with a limited sample size, the findings may not be generalizable to broader populations. However, the data support existing literature and highlight important areas for future research and practice improvement.

CONCLUSION

These findings' conclusion supports individualized therapy, following clinical guidelines, and the critical role of clinical pharmacists as educators and monitors of medication and patients. Subsequent research utilizing larger groups might serve to confirm these trends and continue to refine strategies for chronic respiratory treatment.

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