



Respiratory Medicine

A CROSS-SECTIONAL OBSERVATIONAL STUDY ON THE UTILISATION PATTERN OF DRUGS IN BRONCHIAL ASTHMA PATIENTS AT A TERTIARY CARE TEACHING HOSPITAL IN TAMIL NADU

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ABSTRACT **Background:** Our study mainly focused on the utilisation pattern of drugs in bronchial asthma patients. **Objectives:** The objectives of our study are Demographic details, co morbidities, Types of drug therapy patients received, prescribing pattern of Anti-asthmatic drug, utilisation of antibiotics. **Methodology:** Our study was conducted in Government Medical College and Hospital, Nagapattinam, Tamil Nadu. **Study Duration:** 6Months(April 2024- September 2024). **Result:** In our study males patients were predominantly affected than female, In age wise distribution 31-40 years age category people were affected with asthma and 45% of subject population were with the history of smoking habitant, The patients in our study were affected with hypertension as a most prevalent co morbidity with the rate of 90 patients. About 32 patients were receiving mono therapy for treatment which is mostly prescribed. Salbutamol from β_2 agonist was the highly prescribed drug with 97% followed by hydrocortisone Cefotaxime was the highly prescribed prophylactic antibiotic followed by azithromycin. **Conclusion:** This study highlights the higher prevalence of asthma in males and the frequent use of combination therapies. While the findings gaps in prescription practices, including incomplete dosage schedules, unclear writing, and lack of patient details, were observed. The National Asthma Education Program plays a crucial role in enhancing asthma knowledge and awareness among healthcare providers.

KEYWORDS :

INTRODUCTION

Asthma is a chronic inflammatory disorder of the airways causing airflow obstruction and recurrent episodes of wheezing, breathlessness, chest tightness, and coughing vary over time and in intensity, together with variable expiratory airflow limitation.[1] The prevalence of asthma is higher in high-income countries, but low- and middle-income countries (LMICs) bear a greater burden, with 96% of asthma related deaths and 84% of disability adjusted life years (DALYs) globally. In the Asia-Pacific region, over 50% of children with asthma have severe symptoms, with over 30% undiagnosed. India sees rising prevalence due to urbanisation and pollution.[2]

The pathophysiology of asthma is marked by chronic inflammation and airway hyperresponsiveness, resulting in episodic airflow obstruction. Exposure to allergens, pollutants, or infections activates T-helper 2 (Th2) cells, which release cytokines that recruit eosinophils, mast cells, and other inflammatory mediators. This leads to bronchoconstriction, increased mucus production, and airway edema. Over time, structural changes such as epithelial thickening, fibrosis, and smooth muscle hypertrophy may occur, further narrowing the airways and causing persistent symptoms like wheezing, shortness of breath, chest tightness, and cough.[3]

Recognition that nearly half of asthma deaths could be preventable emphasizes the need for better adherence to management guidelines. Current treatment often focuses on symptomatic relief rather than addressing underlying inflammation, highlighting the potential of the "Treat to Target" (TTT) approach, which aims for clinical remission by eliminating symptoms, reducing exacerbation risks, preventing airway remodelling, and normalizing lung function.[4] A proposed treatment algorithm suggests phasing out short-acting beta-agonists (SABAs) in favour of Anti-Inflammatory Reliever Therapy (AIR) with inhaled corticosteroids (ICS) combined with SABAs. This strategy aims to improve asthma management and reduce its burden on patients and healthcare systems.[5]

This study aims to analyse drug use patterns in bronchial asthma

patients at tertiary care teaching hospital, Nagapattinam. It will assess common co-morbidities, anti-asthmatic prescribing trends, treatment regimens, and frequently used antibiotics, providing insights to support evidence-based asthma management.

METHODOLOGY

Study Design And Setting

This cross-sectional observational study was conducted in the Medicine Department of the Government Medical College and Hospital, Nagapattinam, Tamil Nadu. The study spanned six months, from April 2024 to September 2024.

Study Population And Sample Size

The study included a sample size of 132 patients who were diagnosed with bronchial asthma and admitted to the hospital during the study period.

Inclusion And Exclusion Criteria

The inclusion criteria consisted of both male and female inpatients diagnosed with bronchial asthma. Outpatients, pregnant or lactating women, individuals with mental illness, or those who declined to give consent were excluded from the study.

Data Collection

Data were collected from medical records of asthma patients admitted to the hospital. Information gathered included demographic details as well as personal history. Clinical data such as co-morbid conditions, drug categories, and the types of drug therapy regimens used for asthma management were recorded.

Data Analysis

All collected data were documented in a pre-designed case record form after properly obtaining informed consent from each patient. The information was systematically gathered, organized, and analysed to determine co-morbid illnesses, prescribing patterns of anti-asthmatic drugs, types of therapy regimens, and the classification of commonly

used antibiotics in asthma management. Microsoft excel 2021 was used for data analysis throughout the study.

RESULTS

Demographical Data

The demographic data of patients with bronchial asthma showed that the majority were between 31 and 40 years old, comprising 38 patients (28.8%), with 24 males (28.6%) and 14 females (29.2%), while the minority of the patients were found in the 10-20 age group accounted for 10 patients (7.6%). (Table 1)

Table 1: Age And Gender Distribution Of Patients With Bronchial Asthma

Age Mean age = 41.07±14.11	No. of patients		Total (%)
	Male (n=84)	Female (n=48)	
10-20	6	4	7.6%
21-30	14	4	13.6%
31-40	24	14	28.8%
41-50	18	12	22.8%
51-60	10	8	13.6%
>60	12	6	13.6%

Social Habits And Family History Of Patients

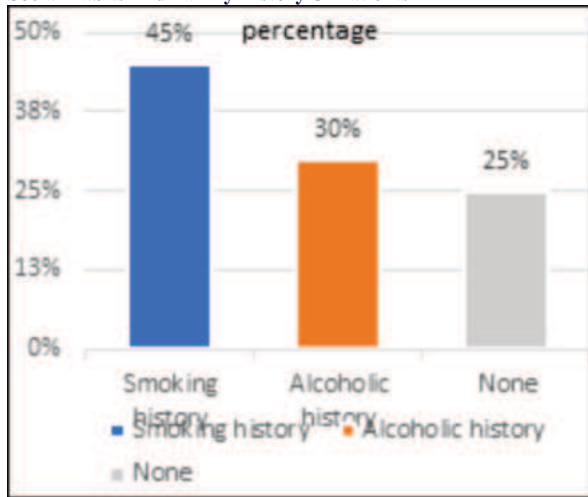


Figure 1:

The Figure 1 explains the social history of the patients were 45% of patient with the history of smoking habit and 30% patients with the alcoholic history

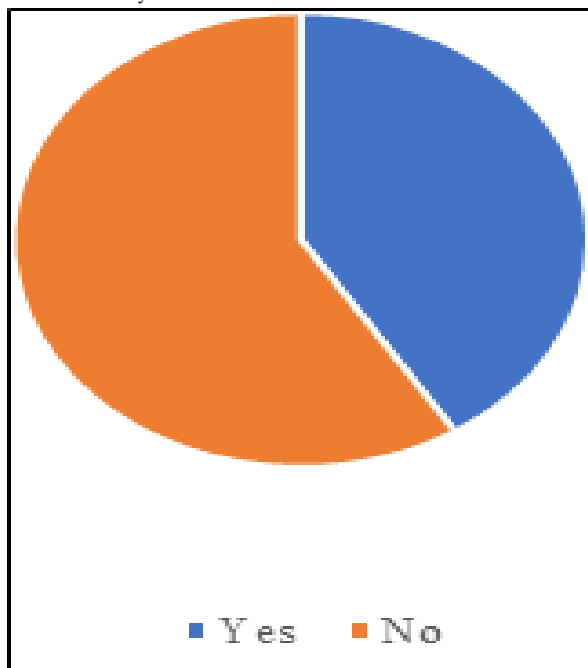


Figure 2:

The Figure 2 explains the family history in which 41% of study population had history of respiratory diseases and 51% study had no history of respiratory diseases

COMORBIDITIES

Among the 132 patients with bronchial asthma, hypertension was the most prevalent comorbidity, affecting 90 patients (68.18%), followed closely by chronic obstructive pulmonary disease (COPD), present in 84 patients (63.63%) and hyperthyroidism was the least common comorbidity, found in 8 patients (6.06%).

Table 2: Co-morbid Conditions In Patients With Bronchial Asthma

Co-morbidities	No. of patients (n=132)	Percentage (%)
Hypertension	90	68.18 %
COPD	84	63.63 %
Bronchial Asthma	60	45.45 %
Type 2 DM	60	45.45 %
Tuberculosis	30	22.72 %
Bronchiectasis	20	15.15 %
Renal Failure	16	12.12 %
Epilepsy	12	9.09 %
Hyperthyroidism	8	6.06 %

Types Of Drug Therapy

In this study, 24.24% of patients received mono-drug therapy, while the remaining 75.76% were treated with multi-drug therapies (dual, triple, or quadruple combinations).

Table 3: Various Types Of Drug Therapy Regimen And Drugs Used To Treat Asthma

Types of drug therapy	Drugs used	No. of patients
Mono drug therapy	Salbutamol	32 (24.24%)
Dual drug therapy	Salbutamol+ Ipratropium Bromide	10 (7.58%)
	Salbutamol + Hydrocortisone	26 (19.70%)
	Salbutamol + Deriphyllin	23 (17.42%)
	Salbutamol + Hydrocortisone + Ipratropium Bromide	11 (8.33%)
Triple drug therapy	Salbutamol + Deriphyllin + Hydrocortisone	17 (12.88%)
	Salbutamol + Hydrocortisone + Deriphyllin+ Ipratropium Bromide	13 (9.85%)

Prescribing Pattern Of Anti-asthmatic Drugs

The most commonly used drugs by category were Salbutamol among β_2 agonists (97%), followed by hydrocortisone among corticosteroids (83.3%) and Deriphyllin in the methylxanthine category (78.7%). (Table 4)

Table 4: Prescribing Pattern Of Anti-asthma Drugs In Bronchial Asthma Patientsutilisation Pattern OfAntibiotics

Therapeutic class	Drugs	Route of administration	No. of prescription	Percentage (%)
β_2 agonist (SABA)	Salbutamol	Nebuliser	128	97 %
		Oral	32	24.2 %
Methylxanthine	Deriphyllin	Parenteral	104	78.7 %
		Oral	40	30.3 %
Corticosteroids	Hydrocortisone	Parenteral	110	83.3 %
	Forocort	Inhaler	34	25.7 %
	Dexamethasone	Parenteral	32	24.2 %
Glucocorticoids	Budesonide	Nebuliser	50	37.8 %
Anticholinergic	Ipratropium Bromide	Inhaler	36	27.2 %
Anti-histamine	Cetirizine	Oral	56	42.2 %
	Chlorpheniramine Maleate	Oral	40	30.3 %

The most commonly used antibiotics by category were cefotaxime among cephalosporins (85.4%), followed by azithromycin in the macrolide category (48.4%).

Table 5: The Most Frequently Used Antibiotics In Bronchial Asthma Patients

Category	Drugs	No. of patients (%)
Cephalosporin	Cefotaxime	85.4 %
	Ceftriaxone	37.8 %
Macrolides	Azithromycin	48.4 %
Neur-aminidase Inhibitor	Oseltamivir	27.2 %
β-Lactamase Inhibitor	Piperacillin	27.2 %
	Meropenem	10.6 %
Quinolone	Ciprofloxacin	13.63 %
Nitroimidazole	Metronidazole	12.12 %
Tetracyclines	Doxycycline	12.12 %

DISCUSSION

Effective management of bronchial asthma is key to improving outcomes by reducing symptoms, preventing exacerbations, and enhancing quality of life. Analysing drug utilization patterns provides essential insights into current prescribing practices, highlighting adherence to clinical guidelines like those from the Global Initiative for Asthma (GINA), which recommend a stepwise approach with inhaled corticosteroids and beta-agonists tailored to severity.[6] Understanding these patterns helps identify areas where treatment can be optimized, ensuring patients receive guideline-based therapies that effectively address both acute and chronic aspects of asthma management.[7]

In our study, findings revealed that β-agonists (97%) were the most commonly prescribed drugs, followed by methylxanthines (52%) and corticosteroids (55%). Our study findings were relevant to the study results of Pandey A et al.,[8] as their study also found through their study that β-agonists was the most commonly prescribed drugs followed by methylxanthine and corticosteroids. We also found that middle-aged male adults are more predominantly affected than female population which aligns with Pandey A et al., findings.

Numerous studies have revealed that children with a family history of asthma and allergy are at greater risk of developing asthma. Our data suggests that about 41% of patients might have a slight risk of asthma due to their family history. Studies conducted by Silvestri M et al.,[9] and Rusconi F et al.,[10] found that smoking history of asthma is most strongly associated with early onset persistent wheezing. This finding has important implications for the study of early life environmental factors in asthma aetiology, as genetics and environment appear to interact in this regard. We hypothesized that maternal smoking during pregnancy, which is a relevant early life exposure, might lead to early onset persistent asthma in genetically predisposed children with a family history of asthma and allergy.

The findings on comorbidities indicated that hypertension (68.18%) and COPD (63.63%) were the most prevalent conditions among asthma patients. Our study aligns with the findings of Su Xinming et al.,[11] who also observed similar results. These conditions complicate asthma management and increase the need for tailored treatment to address both respiratory and cardiovascular issues. The majority of patients (75.76%) received multi-drug therapies, primarily combining inhaled corticosteroids and long-acting beta-agonists, in accordance with GINA guidelines for moderate to severe asthma cases. Our findings are consistent with those of Pandey A et al.,[8] who reported similar results. This approach shows adherence to current best practices for managing persistent asthma symptoms and preventing exacerbations.

Antibiotics like cefotaxime and azithromycin were frequently prescribed, likely to manage respiratory infections that can exacerbate asthma. While antibiotics are not standard for asthma, they may be justified in cases of secondary infection, as infections are known triggers for exacerbations.[12] Our study revealed that the highest number of patients were prescribed drugs from the cephalosporin category, while the lowest number of prescriptions were for tetracycline and nitroimidazole. These findings are similar to those of Trivedi N et al.,[13] who observed that prescribing multiple anti-asthmatic drugs and concomitant medications led to a higher number of drugs per prescription. In their study, the most frequently prescribed medicines were also in the cephalosporin and macrolide categories, consistent with our results.

Limitations include the study's single-center setting and small sample size, which may limit generalizability. Despite this, our findings provide valuable insights into asthma management practices and

underscore the need for further research to optimize care in similar settings. These findings underscore the importance of promoting guideline-based therapy in bronchial asthma to enhance long-term control and reduce reliance on emergency medications. This study provides a foundation for optimizing asthma management practices in tertiary care settings, highlighting the need for continuous evaluation and adaptation of prescribing habits to ensure the best possible outcomes for patients.

CONCLUSION

In conclusion, this study highlights the higher prevalence of asthma in males and the frequent use of combination therapies, such as inhaled corticosteroids and long-acting beta-agonists, for effective asthma management. While the findings support the importance of combination therapy, gaps in prescription practices, including incomplete dosage schedules, unclear writing, and lack of patient details, were observed. The National Asthma Education Program plays a crucial role in enhancing asthma knowledge and awareness among healthcare providers. However, the study has certain limitations, including a small sample size and short duration. It also recommends future studies to address these gaps and underscores the need for more comprehensive and systematic research, particularly in developing countries like India, to better meet the diverse needs of asthma patients and improve treatment practices.

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