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Original Research Article

Study of Drug Utilization Pattern in Adult Bronchial Asthma

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ABSTRACT

Background
Bronchial asthma is a chronic inflammatory condition that leads to airway swelling and constriction, causing breathing difficulties. It is a significant global health issue. A variety of medications, including bronchodilators and anti-inflammatory agents, are available to manage asthma.
Objectives
To assess the drug utilization patterns in bronchial asthma treatment, evaluate the rationality of prescribed medications, and identify any immediate adverse drug reactions associated with these drugs.
Methods
A prospective, observational study was conducted over six months, including 200 patients from the Emergency Department, General Medicine IPD, and OPD of a tertiary care hospital.
Results
Out of 200 patients with acute bronchial asthma, 67% were male, with most patients aged 51-60 years. The most frequently prescribed medications were corticosteroids, followed by beta agonists, muscarinic antagonists, leukotriene modifiers, antihistamines, and methylxanthines, with a preference for long-acting drugs. Treatment methods included combined inhalational and intravenous routes (42%), inhalational and oral (38%), and inhalational alone (20%).
Conclusion
Corticosteroids and β2-agonists were commonly and effectively used, providing rapid symptom relief. Adjunctive therapies, such as antihistamines and leukotriene receptor antagonists, further enhanced symptom management. The findings emphasize the need for ongoing monitoring and regular audits to support evidence-based, rational prescribing and improve asthma care outcomes.
Keywords: Bronchial asthma, Bronchodilators, Corticosteroids, Inhalation

INTRODUCTION

Asthma is an inflammatory disease of the small airways. It is a bronchial inflammation causing swelling of bronchioles and airways constriction, resulting in breathing difficulties.

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The symptoms of asthma include recurrent episodes of wheezing, breathlessness, cough and chest tightness. [1]

Many mediators are recognized to be involved in asthma and the key mediators includes chemokines, leukotrienes, cytokines, histamine, nitric oxide and prostaglandins. [2,3]

Asthma is predominantly observed in developed nations, but its prevalence is rising in developing countries as well. Currently, around 300 million people around the globe are affected by bronchial asthma. In certain regions, the prevalence rates exceed 10% among adults and 30% among children. [4]

Severity of Bronchial asthma is classified into mild intermittent, mild persistent, moderate persistent and severe persistent asthma. [5]

A variety of medication classes, including bronchodilators and anti-inflammatory drugs, are now available for asthma treatment. Choosing the right combination of these agents is crucial for effectively managing the condition and ensuring optimal control of the disease.

AIM OF THE STUDY

The aim of this study was to assess the patterns of medication used for adult bronchial asthma, evaluate their rationality, and identify any immediate adverse drug reactions associated with the administered treatments.

MATERIALS AND METHODS

A prospective, observational, cross-sectional study was conducted over a six-month period (March 2023 to August 2023) in the Emergency Department, General Medicine IPD, and OPD of a tertiary care hospital. Data were collected from the case records of 200 adult patients with bronchial asthma using a structured proforma. Collected information included:

- Patient demographic profile
- Disease-specific data
- Investigations performed
- Medications administered
- Adverse drug reactions observed

Inclusion Criteria

1. Patients diagnosed with acute bronchial asthma
2. Patients aged above 18 years
3. Patients who provide consent to participate in the study

Exclusion Criteria

1. Patients with co-morbid conditions, including COPD, hypertension, congestive cardiac failure, emphysema, eczema, diabetes mellitus, tuberculosis, and malignancies
2. Patients who decline to participate
3. Pediatric patients

The collected data were analyzed to determine prescribing and patient indicators.

Prescribing Indicators

1. Percentage of different classes of drugs prescribed
2. Percentage of antibiotic prescriptions

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3. Percentage of drug administrations by different routes and their combinations

Patient Indicators

1. Male-to-female ratio
2. Age distribution among all patients
3. Average duration of bronchial asthma in years
4. Asthma severity grading
5. Percentage of patients with a family history of asthma

Statistical Analysis: Descriptive statistics were used to analyze the data. Results were presented as percentages and, where applicable, illustrated using graphs.

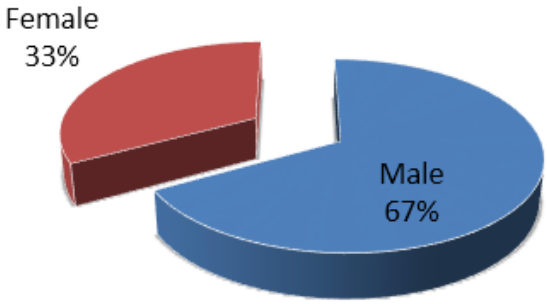
RESULT

Among the 200 patients, 134 (67%) were male and 66 (33%) were female. The majority were in the 51-60 age group, with 94 patients (47%), followed by 56 patients (28%) aged 61-70, and 26 patients (13%) over the age of 70.

Corticosteroids were the most commonly prescribed drugs, followed by beta agonists, muscarinic antagonists, leukotriene modifiers, anti-histamines and Methylxanthines. Long-acting drugs were preferred over short-acting drugs.

Regarding treatment routes, 42% of patients received both inhalational and intravenous therapies, 38% received inhalational and oral therapies, and 20% received inhalational therapy only.

Adverse drug reactions were observed in 21% of patients, including tremors (4%), palpitations (3%), nausea and vomiting (3%), and dry mouth (1%).



Graph1

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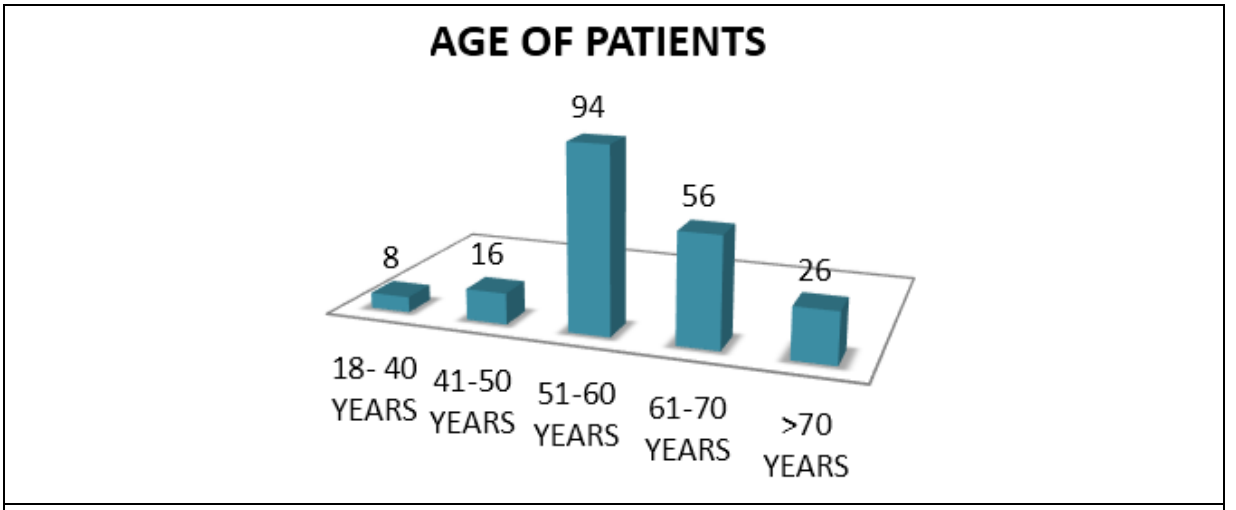
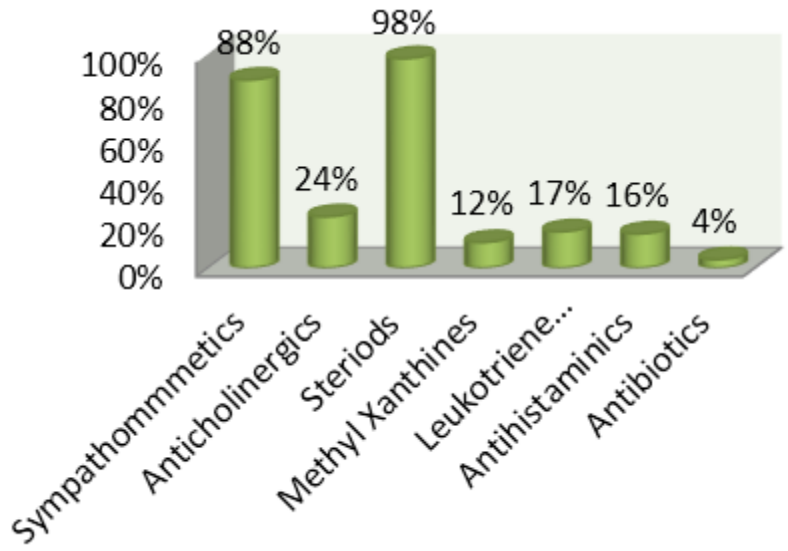


***Graph 2:* Age of Patients**

Severity grading of asthma	No of Patients
Mild intermittent	48(24%)
Mild persistent	104(52%)
Moderate persistent	46(23%)
Severe persistent asthma	2(1%

Table 1: Severity grading of asthma



Graph 3: Different Class of drugs prescribed

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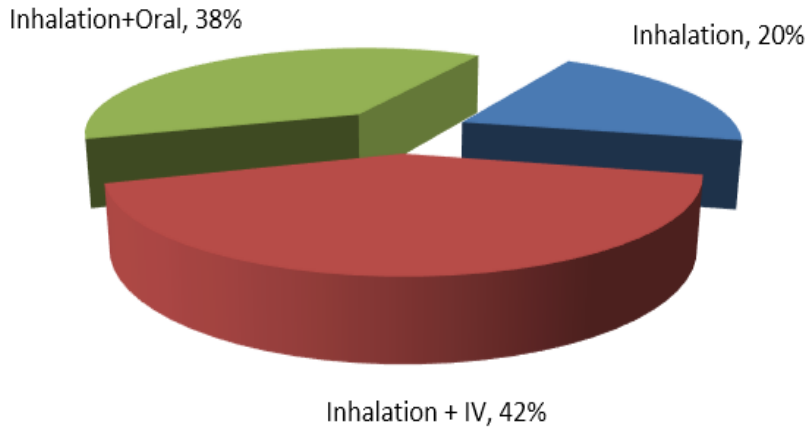
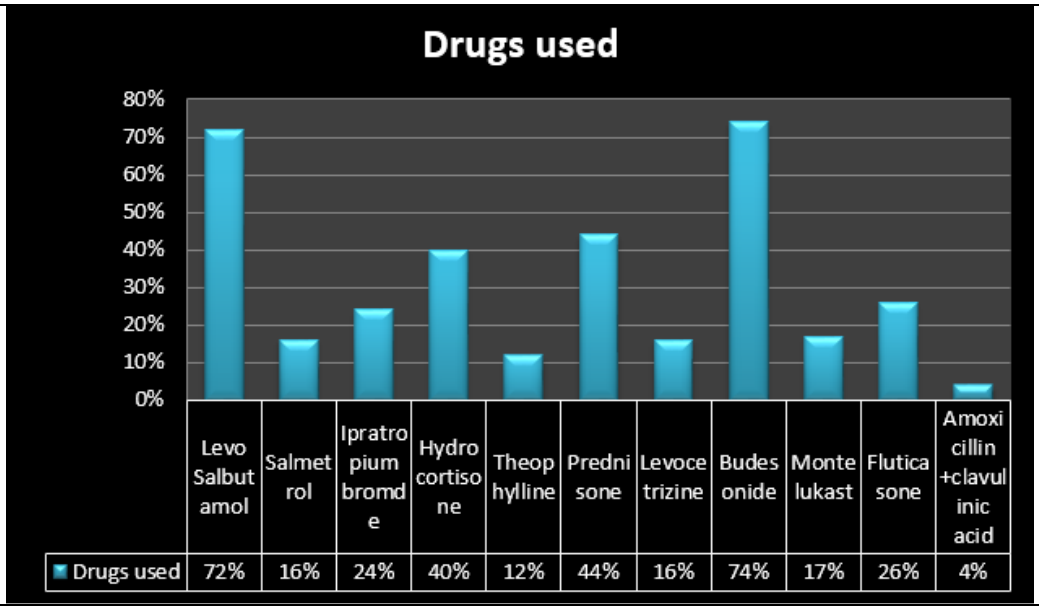


Graph 4: **Combination of different routes of drugs administered**



Graph 4: Individual drugs used

DISCUSSION

A drug utilization study, as a component of medical audit, facilitates the monitoring and evaluation of drug prescribing patterns and suggests necessary adjustments to improve rational therapeutic practices. Analysis of 200 prescriptions in this study showed a higher prevalence of acute bronchial asthma among males (67%) compared to females (33%), consistent with findings from a study conducted in Gorakhpur, India, by Awanish Pandey et al. [7].

The incidence of acute bronchial asthma was found to be more common in the elderly population, with 47% of cases in the 51-60 age group, 28% in those aged 61-70, and 13% in those over 70 years.

Bronchial asthma continues to contribute significantly to morbidity and mortality worldwide. In our study, the most frequently prescribed drugs were budesonide (74%), levosalbutamol (72%), and prednisone (44%). This contrasts with findings from a 2006 medical audit on acute asthma treatment in Canadian emergency departments, where all patients received nebulized β2-agonists, 80% received parenteral steroids, 60% were administered oxygen, and only 5% received theophylline [8].

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Corticosteroids were primarily administered inhalational and intravenously in our study, due to the rapid onset of action, making this method preferable, which aligns with established literature [9].

β2-agonists, considered first-line and life-saving drugs for asthma, were used in 88% of patients in our study. The anticholinergic ipratropium bromide was administered via nebulization in 24% of cases due to its rapid onset, often in combination with sympathomimetics or steroids.

Theophylline was prescribed to 12% of patients. Despite the narrow therapeutic window of xanthines, which has led to a decline in their use for acute bronchial asthma, theophylline remains in use for some cases [10].

Antihistamines such as levocetirizine were used as adjunct therapies in 16% of patients. These medications help improve asthma symptoms, reduce the need for rescue medications, and have some bronchodilatory effects without adversely affecting pulmonary function [11].

Montelukast, a leukotriene receptor antagonist, was mostly prescribed in a fixed-dose combination with levocetirizine for 17% of patients. This combination is effective across a range of asthma severities, providing both anti-inflammatory and bronchodilator effects [12].

Amoxicillin was prescribed to 4% of patients, proving effective against respiratory infections. Its use helped improve bronchial hyperresponsiveness, breathing, and lung function in asthmatic patients with concurrent respiratory infections [13].

CONCLUSION

In conclusion, this study highlights the patterns of drug utilization in acute bronchial asthma management within a tertiary care setting. Findings reveal a higher prevalence of asthma in elderly male patients and underscore the prominent role of corticosteroids, β2-agonists, and theophylline in acute asthma treatment. Intravenous administration of corticosteroids and the widespread use of β2-agonists as first-line therapy align with established practices, emphasizing their effectiveness in rapid symptom relief. Additionally, adjunctive treatments, including antihistamines and leukotriene receptor antagonists, support symptom control and reduce the need for rescue medications.

This study not only reflects current prescribing patterns but also emphasizes the need for continuous monitoring and periodic audits to ensure adherence to evidence-based guidelines and rationalize drug use, ultimately enhancing patient care and safety in acute asthma management.

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