



Journal Homepage: [-www.journalijar.com](http://www.journalijar.com)

## INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/20778

DOI URL: <http://dx.doi.org/10.21474/IJAR01/20778>



### RESEARCH ARTICLE

#### A PROSPECTIVE OBSERVATIONAL STUDY ON PREVALENCE, EFFECTIVENESS AND SAFETY OF PHARMACOLOGICAL THERAPY IN PATIENTS WITH BRONCHIAL ASTHMA.

Fatima Khatoon, Syed Mohammed Kazim, M.A. Aleem, Dr. Juveria Badar, Ayesha Siddiqua, Wajiha Unnisa, Humseer and Jawad Mohammed.

1. Department of Pharmacy Practice, Nizam Institute of Pharmacy, Deshmukhi, Yadadri Bhuvanagiri (Dist), Telangana, India.

#### Manuscript Info

##### Manuscript History

Received: 17 February 2025

Final Accepted: 21 March 2025

Published: April 2025

##### Key words:-

Asthma, Exacerbations, treatment, management, prevalence, diagnosis.

#### Abstract

**Aim:** To analyze the effectiveness of drugs for the management of bronchial asthma. To determine the prevalence of patients diagnosed with asthma. To study in-depth knowledge of the disease in order to improve asthma management in adults. **Methodology:** An observational study was conducted over a period of six months, involving analysis of prescriptions from the Internal Medicine Department. Data were collected using a structured patient data collection form to evaluate diagnosis and treatment approaches for asthma. **Results:** The study included patients across various age groups, with the majority affected being adults aged 41–60 years. The leading cause of asthmatic conditions was found to be allergens (38%), followed by smoking, environmental, and genetic factors. The effectiveness of treatment was monitored using spirometry, peak expiratory flow rate, and type of therapy administered. The therapy primarily included:

- ICS (Inhaled Corticosteroids)
- SABA (Short-Acting Beta-Agonists)
- Combination therapies: ICS+SABA and ICS+LABA (Long-Acting Beta-Agonists) Among the patients:
- 62% were prescribed combination therapy. Of these, 39% showed a favorable response, while 23% showed no significant improvement.
- 38% were prescribed SABA therapy alone. Of these, 33% showed significant improvement, while 5% showed no response.

**Conclusion:** It was observed that combination therapy is safe and effective for treating mild to moderate exacerbations of asthma. SABA alone was found to be effective in managing moderate to severe exacerbations. Therefore, both strategies are beneficial in the effective treatment of asthma.

"© 2025 by the Author(s). Published by IJAR under CC BY 4.0. Unrestricted use allowed with credit to the author."

**Corresponding Author:-Fatima Khatoon**

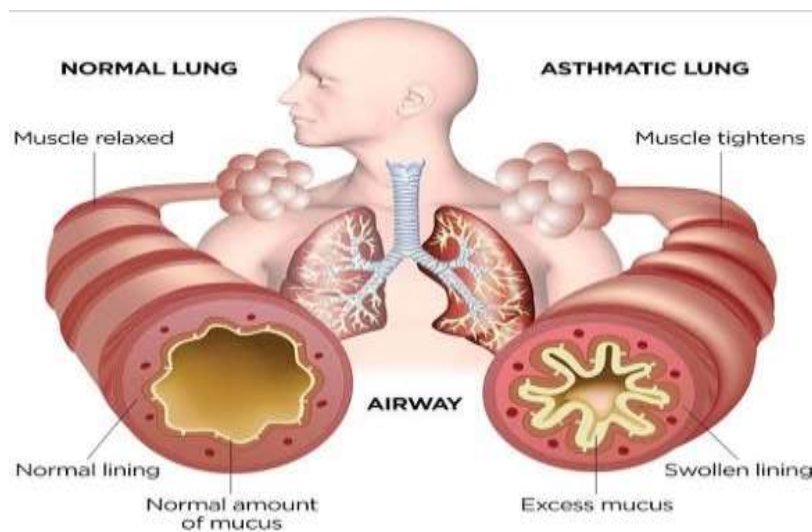
Address:-Assistant Professor, Department of Pharmacy Practice, Nizam Institute of Pharmacy, Deshmukhi.

**Introduction:-**

Lower respiratory tract infections include Asthma, or Bronchial Asthma, which causes difficulty in breathing. As a chronic condition, asthma requires continuous medical management and does not resolve on its own. If left untreated, it can become life-threatening. It is one of the most widespread long-term, non-communicable diseases affecting both adults and children.

Asthma is characterized by intermittent airflow restriction and respiratory symptoms such as wheezing, coughing, chest tightness, and shortness of breath. The condition arises due to complex gene–environment interactions, and its presentation can vary in terms of clinical symptoms, type, and extent of airway inflammation and remodeling.

The primary goal of asthma treatment is to achieve efficient control of the disease by minimizing symptoms, preventing exacerbations, and reducing the risk of disease progression.



“Several types of classification have been proposed but widely accepted classification is” based on severity which is based on symptoms and lung function test.

This may change over a time according to treatment:

**1. CHRONIC ASTHMA**

- Mild intermittent asthma
- Mild persistent asthma
- Moderate persistent asthma
- Severe persistent asthma

**2. ACUTE ASTHMA:** Acute severe asthma, Life threatening asthma, Near fatal asthma

**3. COMMON ASTHMA:** OCCUPATIONAL ASTHMA, ALLERGIC ASTHMA, SEASONAL ASTHMA

**Chronic Asthma:** Referred as asthma symptom that occur more frequently wheezing, coughing, mucus.

Mild intermittent: This occur oftenly in two times a week. Likewise, you can get asthma flare-ups at night up to [twice a month.]

Mild persistent: symptoms greater than 2 days per week, but not daily night time symptoms can occur 2 to 3 [four times per month]

Moderate persistent asthma: Experiences sleep interference at night

Severe persistent asthma: This is most severe occur throughout the day, everyday, nighttime awakening as often as [7 times per week].

**Acute Severe Asthma:** Rapid start of severe symptoms, which could persist all day.

Short-term conditions like upper respiratory tract infections abandoning your asthma treatment plan can both lead to this kind of possible serious asthma.

These may include: Fast breathing, sweating, unable to speak, unable to talk or walk

**COMMON ASTHMA:** Environmental factors are the main cause of this type of asthma.

Allergic asthma: You can be more likely to develop asthma if you have allergies. Although specific causes of allergic asthma can vary, they may include:

Pet, mites, dust mites, and dander, pollen, mold food.

The intensity of your allergies depends on how severe your asthma symptoms are. The most typical type of asthma is allergic asthma, which often requires to be treated by an immunologist.<sup>1</sup>

**ASTHMA AND ITS PATHWAY:** The lung's airway lining swells and becomes irritated during an acute asthma attack. Also, the muscles surrounding the respiratory tract and the airway itself produce mucus. The narrowing of the airways. This together results in less airflow. • Inflammation of the airways: The lining of the airways becomes red, puffy, and narrow in those with asthma. • Airway obstruction • Hyperresponsiveness of the airways. People of all ages can have asthma, however, although some people may only have minor symptoms, others may experience more severe symptoms. Asthma happens for various

Reasons. It can be because of your genes, things in the air that you might be allergic to such as

◇ Pollen ◇ Dust ◇ Infections and ◇ bad air quality family history has asthma or allergies that can also improve your chances of getting asthma. Asthma, a multifaceted respiratory

condition, arises from a combination of genetic predisposition and environmental factors.

Individuals with a family history of asthma or allergies face an elevated risk, underscoring the genetic dimension.

Beyond genetics, various environmental elements contribute to its complexity. Airborne allergens such as pollen and dust can act as triggers, initiating or

exacerbating asthma symptoms. Respiratory infections, too, play a role in its etiology, showing the impact of microbial factors. Moreover, the quality of air one breathes is a crucial factor.

Exposure to pollutants and low air quality can significantly influence the development and severity of asthma.

**Asthma risks:** ◇ Family: If a family has asthma, it might increase the chances or the risk.

◇ Allergies: Things like pollen, dust, or pets can make asthma more likely. ◇ Sickness:

Getting respiratory infections, especially when young, can be a risk. ◇ Air: Bad air from smoking, pollution, or poor air quality can contribute. ◇ Your past: If you had allergies or breathing problems before, it might increase the chance. ◇ Work: Some jobs with specific substances can raise the risk. ◇ Home: Living in damp places or

with mold may also be a risk. Asthma risk factors encompass a continuous influence that extends beyond family, allergic environmental and personal aspects. The family, genetic predisposition remains a high-risk factor, with a family history of asthma amplifying the likelihood of its occurrence.<sup>3,4</sup>

◇ **Inflammation:** Airways become sensitive. ◇ Bronchoconstriction: Bronchoconstriction is the tightening or constriction of the muscles surrounding the airways in the lungs. This

narrowing of the airways makes it harder for air to flow in and out, contributing to the

characteristic breathing difficulties seen in conditions like asthma. Mucus production: the

Excessive production of mucus in the airways. This increased mucus can contribute to airway obstruction, making it more tough for individuals with asthma to breathe. Airway hyper-

**Responsiveness:** Airways react strongly to triggers which causes constriction. Immune system involvement: Allergic reactions and immune responses contribute to inflammation. In asthma, the immune system can overreact to certain allergens or irritants, leading to inflammation in

the airways. ◇ Chronic inflammation: Long-term inflammation leads to structural changes in the airways. **Triggering**

**factors:** Allergens, irritants, infections, exercise

**Signs and symptoms of asthma include:** • Breathlessness • Pain or tightness in the chest • Wheezing during exhalation • A frequent indicator of childhood asthma breathlessness • Coughing • Wheezing that keeps you sleeping<sup>5,6</sup>

An asthma attack is when an asthmatic symptom temporarily worsens. It may occur quickly or gradually over several days. • Fatigue • Disorientation • Drowsiness • Dizziness • Blue lips

• Finger fainting

**DIAGNOSIS:** • PHYSICAL EXAM, • Spirometry: By measuring how quickly and how much air you can exhale after taking a deep breath, this test determines how much your

bronchial tubes have narrowed. • Peak Expiratory flow: Maximum flow. A peak flow meter is a low-tech tool that gauges how forcefully you can exhale. Peak flow measurements that are

lower than normal show that your asthma may be becoming worse and that your lungs may not be functioning as properly.<sup>7</sup>

**Comorbidities:** HYPERTENSION; Asthma patients are more likely to have high blood pressure, and high blood pressure is linked to an increased severity of asthma. The only

factors that can fully account for the co-occurrence of asthma and hypertension are being

Overweight, smoking, and using certain medications. In addition to external risk factors, such as medications and other illnesses, comorbidity can result from a common molecular genetic base, which puts the patient at risk for developing both conditions.<sup>8</sup>

DIABETES MELLITUS Asthma and Diabetes are related to each other by some genetic factors. Exacerbations of Asthma can occur when it is related with an individual diabetic condition. Excess weight can cause the link between Asthma and Diabetes.

**PHARMACOLOGICAL TREATMENT:** Following are the drugs used in management of

Bronchial Asthma: 1. Inhaled Corticosteroids 2. Long-Acting Beta Agonists 3. Short-Acting Beta Agonist 4. Leukotriene Modifiers 5. Monoclonal Antibodies 6. Combination therapy (ICS+LABA)

**INHALED CORTICOSTEROIDS:** Inhaled corticosteroids (ICS) are a type of controller medication commonly used in the management of asthma. They play an important role in controlling and preventing asthma symptoms by reducing inflammation in the airways.<sup>15</sup>

LABA stands for Long-Acting Beta Agonists, often known as bronchodilators, which are typically used to treat asthma. Examples of LABAs are Formoterol and salmeterol.<sup>18,19</sup> LABAs are usually given for use in combination with inhaled corticosteroids (ICS) for

Treating Asthma. Combining ICS and LABA is thought to be a very effective and often used medication for managing the effects of asthma. Whereas LABAs cause delayed Broncho Dilation, ICS help reduce discomfort in flights.<sup>20,21</sup>

SABAs are bronchodilators, like Levalbuterol, that act by relaxing the muscles in the airways to improve airflow and relieve bronchoconstriction quickly. Rescue Medications: Because SABAs relieve acute asthma symptoms quickly, they are frequently referred to as rescue

Medications. They are frequently used to treat symptoms that worsen suddenly or during an asthma attack.

A class of medications known as leukotrienemodifiers is used to treat asthma, they function by altering the activity of leukotrienes. Leukotrienes are mediators that play a crucial role in the inflammatory cycle in the airways and exacerbate bronchoconstriction in asthmatic patients.<sup>22</sup> Leukotriene modifiers are particularly helpful when administering mild to moderate persistent asthma. They are frequently suggested as an alternative to inhaled corticosteroids or other asthma medications.<sup>23</sup>

#### **I. MATERIALS AND METHODS:**

- Place of Study: Tertiary Hospital.
- Study Design: Prospective Observational Study
- Duration of Study: 6 months.
- Inclusion Criteria: All Inpatients diagnosed with Asthma. Patient who are willing to give consent.
- Exclusion Criteria: Patient less than 18 years are excluded. Patients who are not willing to give consent form.
- Source of Data: Patient data collection form and patient counselling form
- Method of Data Collection: Patient profile form and patient counselling form.

**II. RESULTS**  
**PREVALANCE**

**1. Classification of patients based on Aetiology**

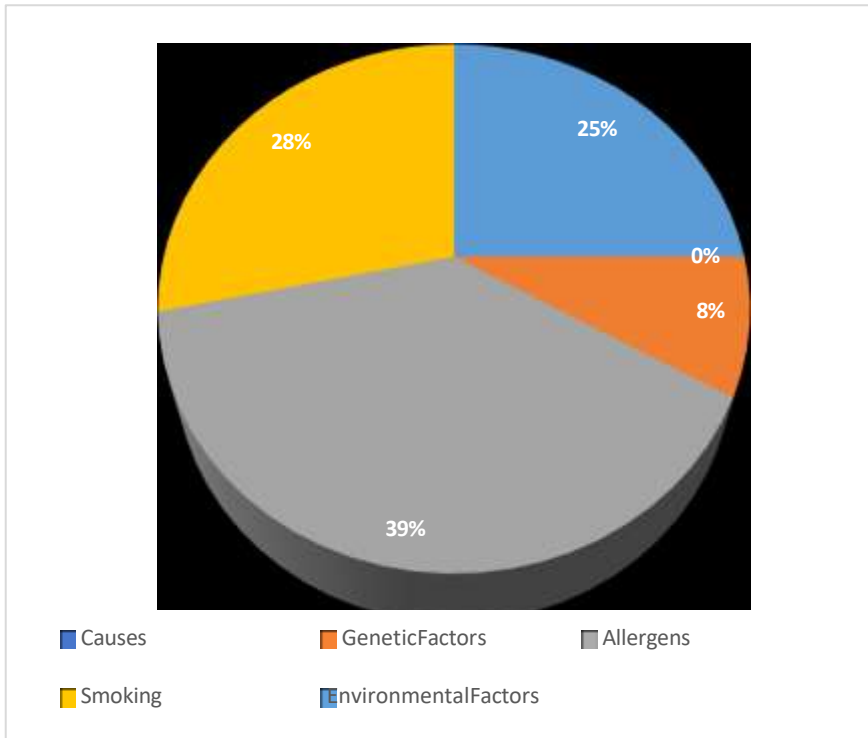
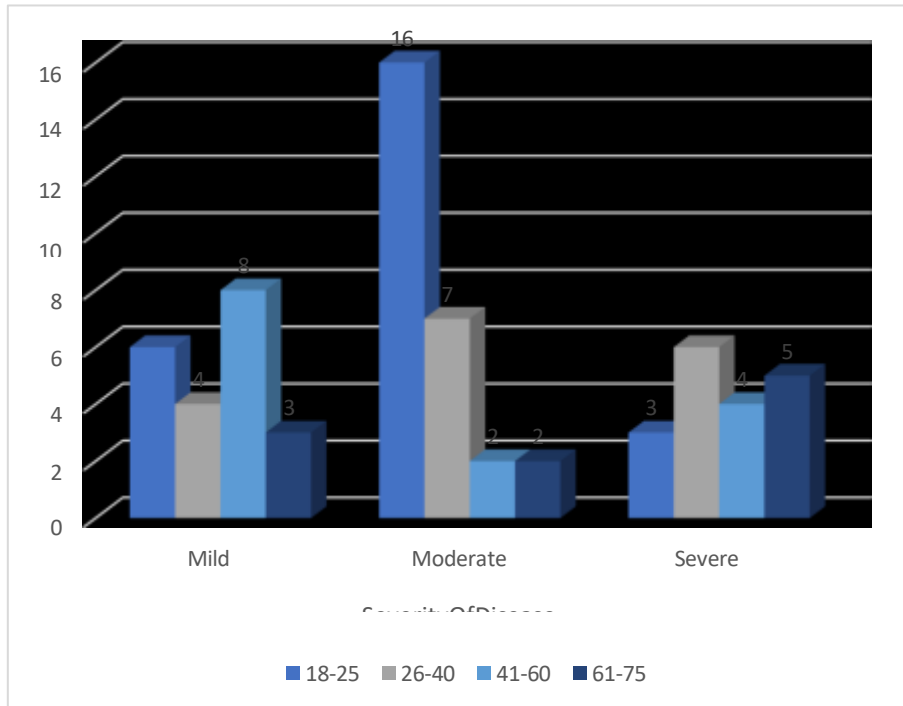


Fig: 1

The patients were regrouped based on the cause of Asthma which included exposure to Allergens, smoking habits, environmental factors and genetic factors.

Out of 60 patients common cause for Asthma was found to be in patients exposed to Allergens (39%). Remaining 28% was due to smoking, 25% were due to environmental factors and 8% were found to be genetic reason of the individuals.

2. Distribution of patients according to their age



Age group of patients between 18-75 years were taken into consideration and were further classified based on their severity levels (mild, moderate and severe). The average group of individuals was found to be 41-60 years of age.

3. Distribution of patients according to their gender

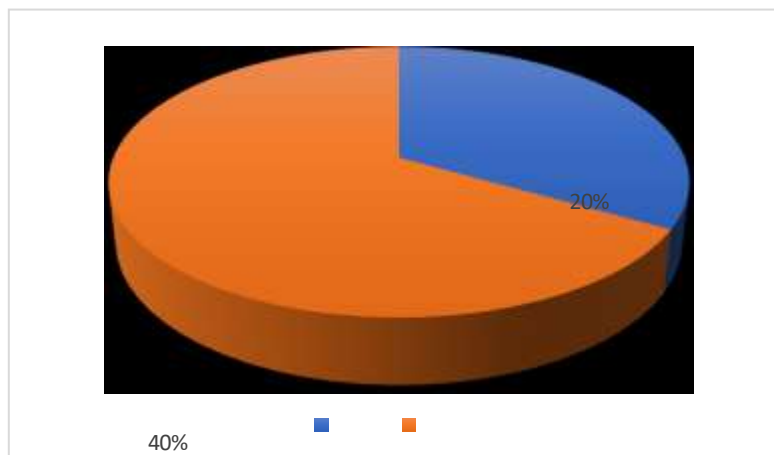


Fig 3

The patient's gender was taken into consideration. Out of 60 patient cases, males amount to be at 33% and furthermore female's amount's to be at 67%.

4. Chief complaints seen in patients

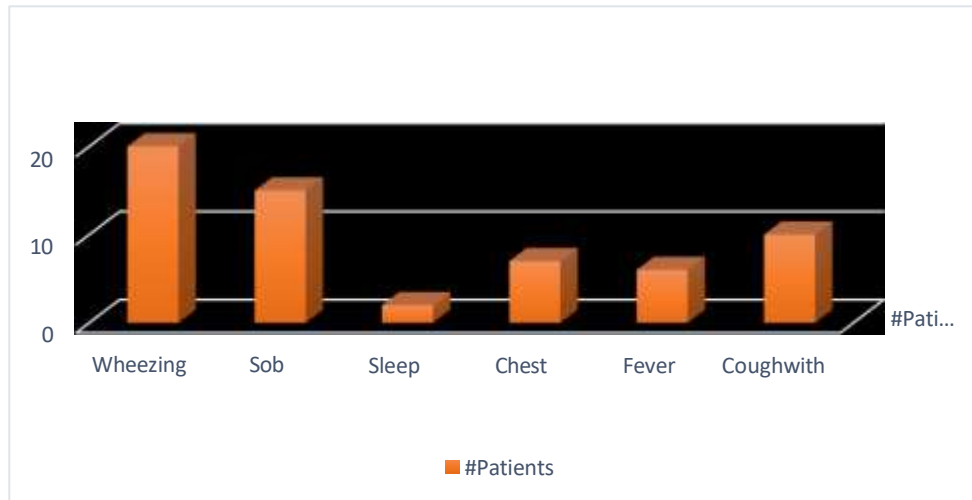
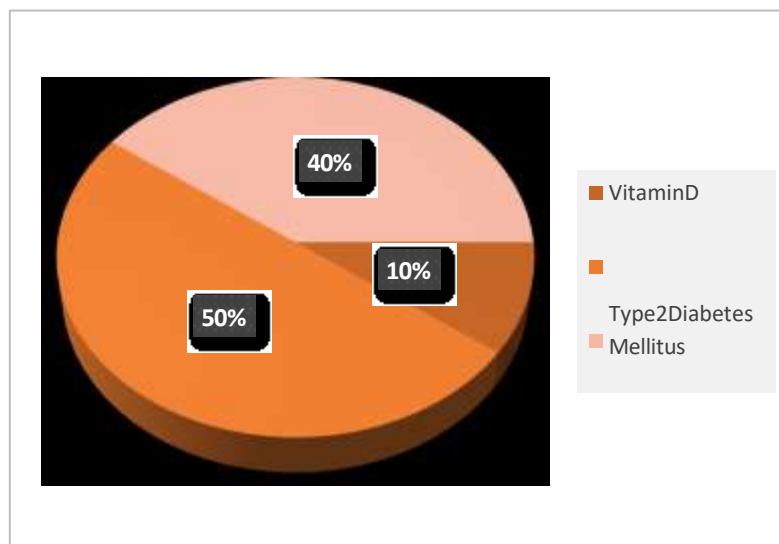


Fig 4

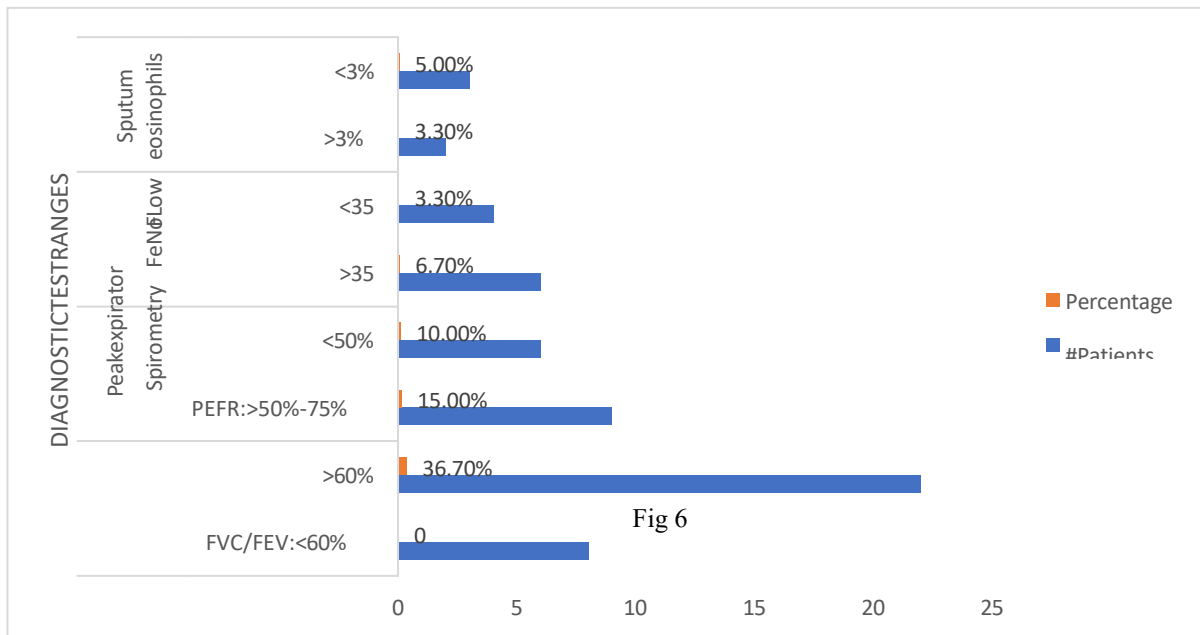
Majority of the patients came with the complaint of wheezing (33%). Other complaints included shortness of breath (25%), chest tightness (11%), cough with sputum (15%), fever (10%) and sleep Apnea (3%).

5. Distribution of patients according to their co-morbidities



Hypertension, Diabetes Mellitus and Vitamin D are the three common co-morbid conditions in Asthma.

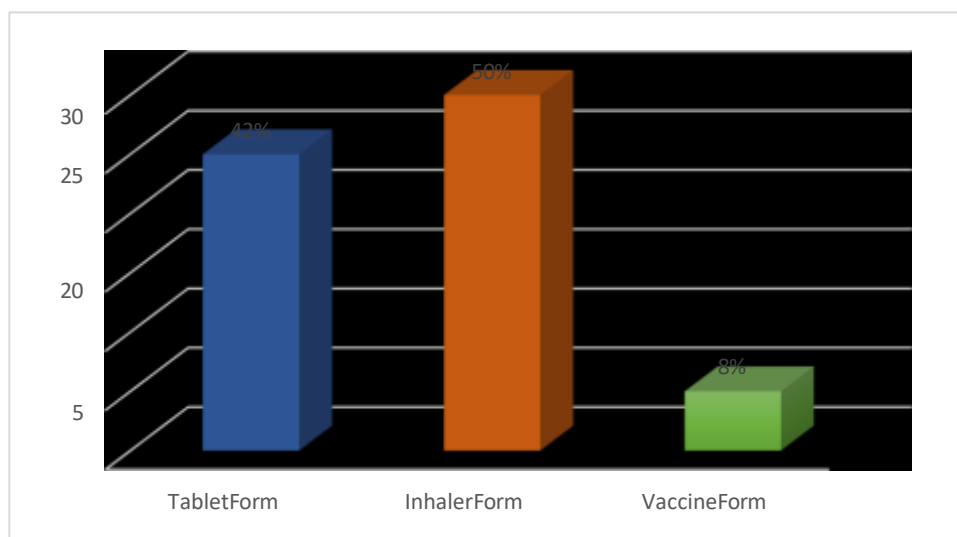
6. Patients divided based on diagnostic tests



Diagnostic tests such as peak expiratory flow, spirometry, Feno, sputum eosinophil's ranges were considered.

7. Distribution of patients based on Formulation

Fig 7



8. Distribution of patients based on Drug usage

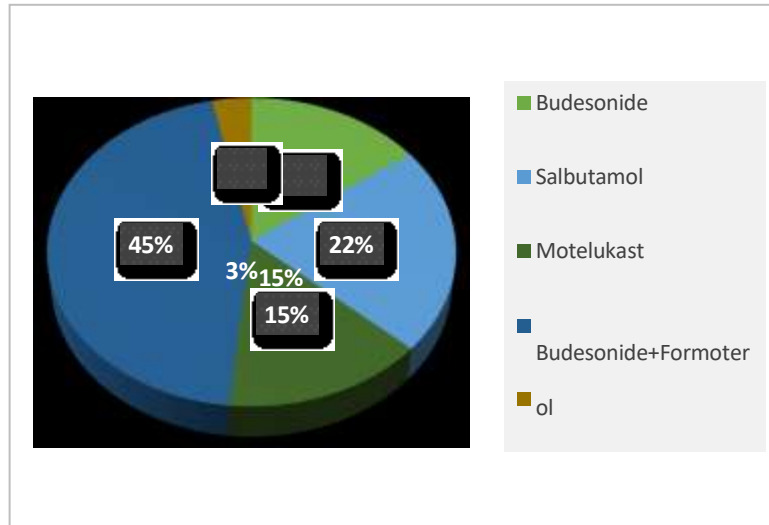


Fig 8

Commonly prescribed drugs were Budesonide, Salbutamol, Montelukast, Formoterol and Omalizumab.

9. Distribution of patients based on Drug class

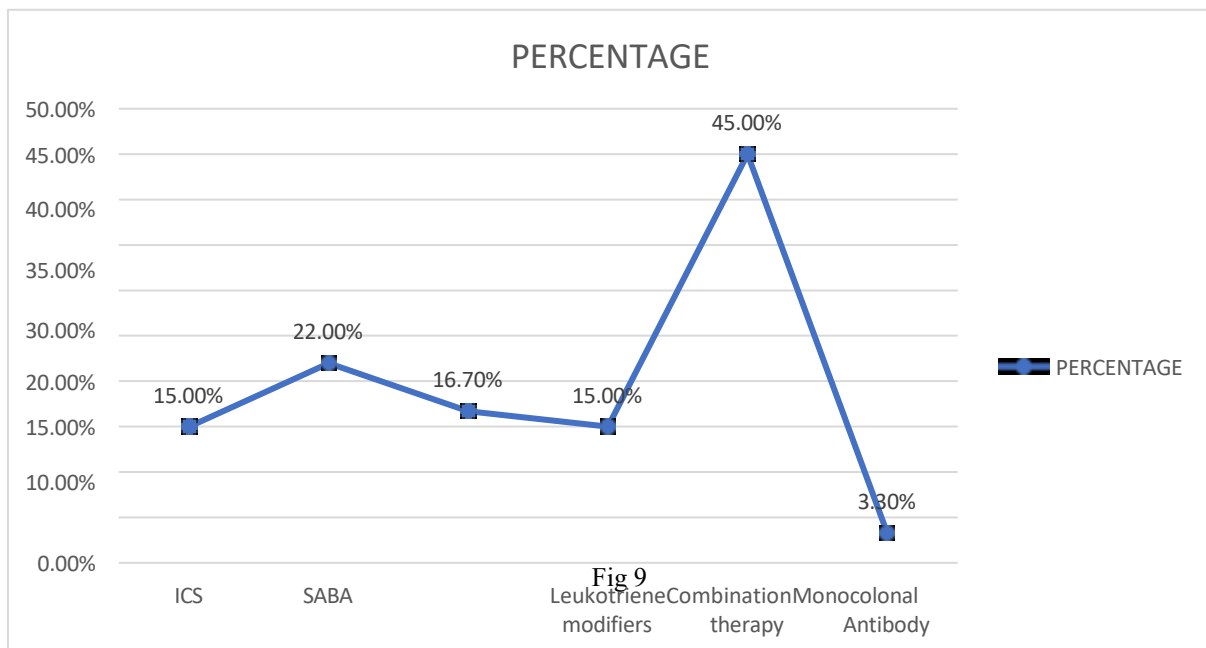


Fig 9

In our study inhaled corticosteroids were prescribed to 9 patients, short-acting beta agonist were prescribed to 13 patients, Montelukast was prescribed to 9 patients, Combination therapy of ICS and LABA were prescribed to 27 patients and Omalizumab was given to 2 patients.

### III. DISCUSSION:

A Prospective observational study on Prevalence, Effectiveness and Safety of Pharmacological treatment in patients with Bronchial Asthma was carried out for a period of six months. In our study we found that widespread presence of Asthma and severity levels among individuals. The patients were categorized as follows:

1. Based on their Etiology
2. According to different Age groups and genders
3. Chief complaints/symptoms viewed in patients
4. Patients with co-morbid conditions
5. Laboratory Investigations
6. Prescription patterns

In our study we included patients with 4 different age groups (18-25, 26-40, 41-60, 61-75), from which the average group of affected individuals was found to be adults (Age 41-60 Years).

Females are more prone to asthma than Males

Main cause of Asthmatic condition in people was found to be Allergens (38%), remaining 28% of individuals were affected by smoking, environmental factors and genetic factors were 25% and 8% respectively. Wheezing (20%) was the major chief complaint among the study subjects. Other symptoms were shortness of breath (15%), Chest tightness (7%), Fever (6%), Cough with sputum (10%), and sleep apnea (2%).

Diabetes mellitus and Hypertension were the most common co-morbid conditions in patients with bronchial Asthma.

The treatment of Asthma patients included single and combination therapies:

1. Patients treated with inhaled corticosteroids (ICS)
2. Patients treated with Long-Acting Beta Agonist (LABA)
3. Combination therapy of ICS+LABA.

### IV. CONCLUSION:

This prospective observational study was to determine the effectiveness and safety of [ICS, SABA, LABA] in management of bronchial Asthma in individuals. The study included patients with mild moderate and severe disease conditions.

Cases were collected keeping in view this study is an observational study, no interventions

were made during the study. The quantitative data were obtained following the guidelines and patient data was kept confidential throughout the study

Main cause of fasthmatic condition was seen in people, that was found to be allergens [38%] remaining 28% were affected by smoking, environmental factor, genetic factor

Diabetes mellitus and hypertension is the most common co-morbid condition in patients with bronchial Asthma, Females are more prone to Asthma than Males.

We have monitored through investigations such as spirometry, peak expiratory flow rate and to decide what type of therapy given.

This therapy mainly includes ICS [Inhaled corticosteroids], SABA [Short acting bronchodilators] and combination therapy [ICS+SABA] [ICS+LABA].

In patients who were prescribed with combination therapy was 62% patients out of which 39% patients shows a favorable response 23% patient doesn't show any significant improvement.

In patients who were retreated with only SABA therapy was 38% out of which 33% patients shows a significant improvement and 5% patients doesn't show any response.

To conclude, it was observed that combination therapy was safe and effective in treating mild-moderate

Exacerbations and SABA was safe in treating moderate - severe

Exacerbations

Therefore, help in treating Asthma prosperously.

## V. REFERENCES

1. Lötval J, Akdis CA, Bacharier LB, et al. Asthma endotypes: a new approach to classification of disease entities within the asthma syndrome. *J Allergy Clin Immunol.* 2011;127(2):355-360. doi:10.1016/j.jaci.2010.11.037.
2. Doering DC, Solway J. Airway smooth muscle in the pathophysiology and treatment of asthma. *J Appl Physiol* (1985). 2013 Apr;114(7):834-43.
3. Subbarao P, Becker A, Brook JR, et al. CHILDS Study Investigators. Epidemiology of asthma: risk factors for development. *Expert Rev Clin Immunol.* 2009;5:77-95. doi: 10.1586/1744666X.5.1.77.
4. Burke W, Fesinmeyer M, Reed K, et al. Family history as a predictor of asthma risk. *Am J Prev Med.* 2003;24:160-9. doi: 10.1016/s0749-3797(02)00589-5.
5. Global burden of 369 diseases and injuries in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet.* 2020;396(10258):1204-22
6. InformedHealth.org [Internet]. Cologne, Germany: Institute for Quality and Efficiency in Health Care (IQWiG); 2006-. Asthma: Learn More – Symptoms and diagnosis.
7. Asthma: diagnosis, monitoring and chronic asthma management. London: National Institute for Health and Care Excellence (NICE); 2021 Mar 22. (NICE Guideline, No. 80.)
8. Maselli DJ, Sherratt J, Adams SG. Comorbidities and multimorbidity in asthma. *Curr Opin Pulm Med.* 2025 May 1;31(3):270-278.
9. Jonathan Corren, Abhishek Kavati, Jennifer Colby [July 1, 2017] Efficacy and safety of omalizumab in children and adolescents with moderate to severe asthma; systematic literature review
10. Susan Joy Towns, Peter Paul van I. March 2009. *Respiratory Journal 2009* diagnosis and management of asthma in adolescents.
11. Terufumishimoda, 2016 July. Influence of cigarette smoking on airway inflammation and inhaled corticosteroid treatment in patients with asthma.
12. Eric Buteman et al. *J. Allergy Clin Immunol* 2010 March. Overall asthma control: the relationship between current control and future risk
13. Jill Daviset. *Journal of Asthma*. 2019 March. Burden of asthma among patients adherent to ICS/LABA: a real world study.
14. Ashutosh Nath Aggarwal et al. *Respir Care*. 2021 Dec. Impact of asthma on severity and outcomes in COVID-19
15. Kisielma, Jacobsson M, Franklink, Janson C. 24 Nov 2021. Risk factors for the absence of diagnosis of asthma despite disease symptoms: results from the Swedish GA2LEN study
16. O'Byrne PM, Barnes PJ, Rodriguez-Roisin R, Runnerstrom E, Sandstrom T, Svensson K, Tattersfield A. Low dose inhaled budesonide and formoterol in mild persistent asthma: the OPTIMA randomized trial. *Am J Respir Crit Care Med* 2001;164:1392-1397.
17. Price D, Fletcher M, van der Molen T. Asthma control and management in 8,000 European patients: the REcognise Asthma and LInk to Symptoms and Experience (REALISE) survey. *NPJ Prim Care Respir Med.* 2014 Jun 12;24:14009.
18. Blais L, Suissa S, Boivin J, et al. First treatment with inhaled corticosteroids and the prevention of admissions to hospital for asthma. *Thorax* 1998;53:1025-1029.
19. Tesfaye ZT, Gebreselase NT, Horsa BA. Appropriateness of chronic asthma management and medication adherence in patients visiting ambulatory clinic of Gondar University Hospital: a cross-sectional study. *World Allergy Organ J.* 2018 Aug 10;11(1):18.
20. Normansell R, Kew KM, Stovold E. Interventions to improve adherence to inhaled steroids for asthma. *Cochrane Database Syst Rev.* 2017 Apr 18;4(4):CD012226.
21. Razi E, Moosavi GA, Razi A. Effect of age on response to treatment in adult patients with severe persistent asthma. *Tanaffos.* 2012;11(2):16-21.

- . To T, Stanojevic S, Moores G, Gershon AS, Bateman ED, Cruz AA, Boulet LP. Global asthma prevalence in adults: findings from the cross-sectional world health survey. *BMC Public Health*. 2012 Mar 19;12:204.
22. Medically reviewed by Alan Carter, Pharm.D. —By Ana Gotter—Updated on September 8, 2023
  23. Liang TZ, Chao JH. Inhaled Corticosteroids. [Updated 2023 May 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-.
  24. National Asthma Education and Prevention Program. Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma—Summary Report 2007. *J Allergy Clin Immunol*. 2007 Nov;120(5 Suppl):S94-138.
  25. Long acting  $\beta_2$  agonists in adult asthma *BMJ* 2013;347 doi: <https://doi.org/10.1136/bmj.f4662> (Published 06 August 2013) Cite this as: *BMJ* 2013;347:f4662
  26. D'Urzo AD, Jugovic P, Bouchard J, Jhirad R, Tamari I. Safety of long-acting beta2-agonists in the management of asthma: a Primary Care Respiratory Alliance of Canada perspective. *Can Fam Physician*. 2010 Feb;56(2):119-20, 123-4.
  27. D'Urzo AD, Jugovic P, Bouchard J, Jhirad R, Tamari I. Safety of long-acting beta2-agonists in the management of asthma: a Primary Care Respiratory Alliance of Canada perspective. *Can Fam Physician*. 2010 Feb;56(2):119-20, 123-4.
  28. Biologic therapies for severe asthma | Asthma + Lung UK ([asthmaandlung.org.uk](http://asthmaandlung.org.uk))
  29. Mellon M. Efficacy of budesonide inhalation suspension in infants and young children with persistent asthma. Budesonide Inhalation Suspension Study Group. *J Allergy Clin Immunol*. 1999 Oct;104(4 Pt 2):191-9.
  30. Bartow RA, Brogden RN: Formoterol. An update of its pharmacological properties and therapeutic efficacy in the management of asthma. *Drugs*. 1998 Feb; 55(2):303-22.

