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Current Scenario on Drugs Utilized for Treatment and Management of Asthma

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Anil Kumar[1], Chanchal Chaurasiya[2]*

1Asst. Professor, Pharmacology Department, Rajiv Academy for Pharmacy, Mathura, VPO-Banchari, Teh-Hodal, Distt- Palwal (Haryana)

2Asst. Professor, Pharmaceutics Department, Rajiv Academy for Pharmacy, Mathura, H.No.-89, Gopal Nagar, Mal, Godam Road, Mathura (U.P.)

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ABSTRACT

Asthma is the most common respiratory disorder worldwide. Regular monitoring of asthma control adherence to therapy. Asthma affects all the stages of life like child, adult, pregnant women's and geriatrics. There are different treatment and measures in all the different stages of life. In addition, treatment varies as per type and severity of asthma. There is a no. of drugs and dosage forms are available to support treatment at every case. The objective of this article is to present current scenario of drugs prescribed in different case of asthma and the drugs highly prescribed in India to provide best support in the treatment of asthma. For the best knowledge, a survey was conducted in different territories of Uttar Pradesh, Haryana, Delhi & Rajasthan, and data collected by interviewing doctors, pharmacists, and patients with literature support. The findings by survey are given in the article to present current prescription pattern for asthma.

INTRODUCTION

Asthma is a respiratory disorder, usually characterized by chronic airways inflammation. It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness and cough that vary over time and intensity, together with variable expiratory airflow limitation. (1)

According to the latest WHO estimates, released in December 2016, there were 383000 deaths due to asthma in 2015. (2) There are 300 million asthmatics worldwide with 1/10th of those living in India. (3) Between 15 and 20 million people have asthma in India, estimates the World Health Organisation, with some studies putting the numbers higher at 30 million. (3)

The sales of anti-asthma medicines in India went up 43% over the past four years, shows market data, with 2016 marking a 15% growth in anti-asthma prescriptions across children and adults. (4)

Experts are struggling to understand why asthma rates worldwide, on average, are rising by 50% every decade. "Some blame it on hygiene hypothesis, which holds that children with lower exposure to bacteria and viruses in early childhood do not develop a robust immunity. (4)

Other triggers include sudden overuse and misuse of antibiotics, indoor and outdoor air pollution, pollen, food colour and additives, obesity, smoking, secondhand smoke, poorly ventilated homes and workplaces (10% of adult asthma is work-related), cold weather, exercise and stressors such as domestic violence and even relationships breaking down.(4)

A recent review analysis of 15 epidemiological studies showed that the mean prevalence of asthma among children was 7.24%. The prevalence of childhood asthma has continued to increase in last 10 years on the Indian subcontinent.

According to India's largest community of verified doctors Curofy in a poll of 1040 doctors, 82% said that there has been an increased asthma incidence in children due to increased environmental pollution. (5)

As the thirteen of the world's 20 most polluted cities are in India, shows World Health Organization's ambient air pollution database. The air in Delhi, Patna, Gwalior and Raipur

has the highest amounts of tiny suspended particles (PM2.5) that penetrate deep into the airways and lungs to cause asthma, bronchitis, heart disease, stroke and a clutch of other diseases.[6] In India, the effective screening, evaluation and management strategies for asthma have not been fully implemented[7], so long-term treatment is generally required for an effective management, which has an effect on the cost of the therapy and patient's compliance. [8]

Here, in this study, an attempt has been made to understand the attitudes of physicians and patients towards the pharmacological approaches in management of asthma. The study is focus on the scenario of current drug prescribing pattern and the role of pharmacist in improving patients' health and in optimizing the costs of drug regimens. The study was conducted in randomly selected urban and rural area of Mathura, Meerut, Jaunpur, Allahabad, Shahjahanpur, Palwal, Delhi and Jaipur between the January 2017 to December, 2017.

This study aimed to assess drug utilization in asthma therapy as a quantitative type of prescription auditing to generate data with respect to their extent variability of drug usage in a health care system of particular criteria.

STUDY DESIGN

The study was conducted by retrospective method. This is a much cheaper way to collect data [9]. The data is collected by interviewing about 50 specialist doctors, 250 pharmacists of medical stores & hospitals and 500 Patients in different territories and location of Uttar Pradesh, Haryana, Rajasthan and Delhi in India, and by literature survey. Furthermore, the study is detailed in table-1.

Table-1: Study Design

1	**Method of data collection**	Retrospective
2	**Process of data collection**	By interviewing and literature survey
3	**Interviewee**	50 Doctors, 250 Pharmacist of medical stores & hospitals and 500 Patients
4	**Physician status**	All were Respiratory Specialist
5	**Selected location for data collection**	Cities of states Uttar Pradesh, Haryana, Rajasthan, & Delhi
6	**Location Preference**	Both Urban and Rural areas
7	**Patients Included**	Male, Female and children's suffering from asthma
8	**Patients Excluded**	Having other major diseases than Asthma
9	**Patients Status**	Covering a wide range of economical, demographical and social variation
10	**Special consideration**	Also, include pregnant and lactating women's

The interview contain questionnaire about asthma, its symptoms, stages of asthma, severity, prescription for different types of asthma, dose regimen on the basis of its severity and for the patients with different age groups, drugs prescribed for asthma to pregnant women's.

RESULTS AND DISCUSSION

During the study, about 50 specialist doctors, 250 pharmacists of medical stores & hospitals and 500 Patients were included for data analysis as per the inclusion and exclusion criteria. Majority of the patients were in the age group of 40-60 years or under the age of 20 years (Table-2). On the behalf of doctors interview, general consideration about asthma is collected (Table-3).

Table-2: Patient Information

S. No.	Age of Patient	No of Patient Interviewed	
		Urban Area	Rural Area
1	<=20	105	70
2	21=40	55	35
3	41=60	100	80
4.	60=80	20	15
5.	>=81	05	15

Table-3: General Consideration On Asthma

<table>
<tr><td>1</td><td>What is asthma</td><td colspan="3">Asthma is characterized by episodic, reversible bronchospasm resulting from an exaggerated bronchoconstrictor response to various stimuli.[10]</td></tr>
<tr><td>2</td><td>Symptoms</td><td colspan="3">• Episodic dyspnea
• Wheezing (a soft whistling sound during expiration)
• Breathlessness
• Chest tightness
• Cough (with or without sputum)</td></tr>
<tr><td rowspan="2">3.</td><td rowspan="2">Causes</td><td>In Adults</td><td>In Children’s</td><td>In Pregnant women’s</td></tr>
<tr><td>In Males:
• 30% cases by allergies.
• Allergens
In females:
• Hormonal fluctuations
• Menopause
• Pregnancy[11]</td><td>• Viral Infections or common cold
• Allergies
• Physical activities
• Weather change[12]</td><td>• Gastroesophageal reflux or acid reflux
• Hormonal fluctuations[13]</td></tr>
<tr><td>4</td><td>Assess for symptom patterns</td><td colspan="3">• Recurrent/episodic
• Occur/worsen at night or early in the morning
• Occur/worsen upon exposure to allergens (e.g., animal dander, pollen, dust mites) or irritants (e.g., exercise, cold air, tobacco smoke, infections)
• Respond to appropriate asthma therapy[14]</td></tr>
<tr><td>5</td><td>Stages of asthma</td><td colspan="3">1. Intermittent
2. Mild intermittent
3. Moderate persistent
4. Severe persistent [15]</td></tr>
<tr><td>6</td><td>Diagnosis test for asthma</td><td colspan="3">1. Peak Flow Test
2. Spirometry
3. Broncho Provocation Test (Methacholine, Histamine, Mannitol)
4. Allergy Testing(16)</td></tr>
</table>

The study revealed that 30% of asthma causes in males is due to allergies caused by different types of allergens while in females - hormonal fluctuations, Menopause and pregnancy were the major causes of asthma. Women's during pregnancy have higher risk of asthma due to hormonal fluctuations. Also, the study revealed that viral infections, Allergies, Genetic and weather change were major reasons for asthma in children's. Most of the patients during interview committed that symptoms of asthma worse at night or early in the morning. Trend of Drug Prescriptions were analyzed on various criteria and it was found that allergic asthma is generally treated with the help of more than two drugs combinations. For allergic asthma, the combination of bronchodilators, anti-inflammatory drugs & antibody treatment were

most commonly used. While for non-allergic asthma, combination of antibiotics, corticosteroids & beta agonist's drugs was most commonly prescribed (Table-4).

Table-4: Prescription On The Basis of Type of Asthma

S.NO	TYPE OF ASTHMA	PRESCRIBED MEDICINES (MOST COMMON)
1.	Allergic asthma	1. Bronchodilators (Salbutamol) 2. Anti-inflammatory drugs (NSAIDs) 3. Inhaled or oral corticosteroids (Prednisolone, Dexamethasone) 4. Anti Leukotriene Drugs (Montelukast, Zafirlukast) 5. Antibody Treatment (Omalizumab)
2.	Non Allergic asthma	1. Antibiotics (Penicillin group) 2. Corticosteroids (Prednisolone, Dexamethasone) 3. Beta Agonists (Albuterol, Levalbuterol)

Prescriptions were also analyzed on the basis of severity (Table-5). Study revealed that primary asthma is commonly cured by using one or two drugs combinations. Endophilin and Theophylin were the most common drugs used in the treatment of primary asthma. While in the treatment of secondary asthma, bronchodilators were also prescribed with addition to primary asthma treatment. But in case of severe asthma, study revealed that inhalers were most commonly prescribed which helps the patient from sudden asthmatic attack.

Table-5: Prescription On The Basis Of Severity

S.NO	SEVERITY STATUS	PRESCRIBED MEDICINES
1.	Primary	1. Antibiotic (Penicillin Group) + Azithromycin 2. Levocetirizine + Montelukast 3. Etophylin + Theophylline 4. Steroids (Batnesol, Deflazacort, Prednisolone)
2.	Secondary	Primary Treatment + Bronchodilators (Salbutamol)
3.	Severe	Inhalers

A total of 50 prescriptions which were prescribed to asthmatic pregnant woman were specially analyzed to understating the scenario of prescription pattern for pregnant woman's (Table-6) and the study revealed that pregnant woman's which were suffering from mild intermittent asthma were treated only by a course of systemic corticosteroid and advised for yoga and morning exercise. While the mild persistent asthmatic pregnant woman were preferred to treat by low-dose inhaled corticosteroids. Cromolyn, leukotriene receptor antagonist or sustained release theophylline was also used as alternative treatment for mild persistent asthmatic pregnant woman's.

Table-6: Prescription for Pregnant Woman's

S. No.	TREATMENT STEPS	PRESCRIBED MEDICINES
1.	Mild Intermittent	No daily medication needed. • Severe exacerbations may occur, separated by long periods of normal lung function and no symptoms. A course of systemic corticosteroid is recommended.
2.	Mild Persistent Asthma	**Preferred Treatment:** - Low-dose inhaled corticosteroid. **Alternative Treatment**: cromolyn, leukotriene receptor antagonist OR sustained-release theophylline to serum concentration of 5–12 mcg/mL.
3.	Moderate Persistent Asthma	**Preferred Treatment:** - Low-dose inhaled corticosteroid and long-acting inhaled beta2-agonist OR Medium-dose inhaled corticosteroid. If needed (particularly in patients with recurring severe exacerbations): - Medium-dose inhaled corticosteroid and long-acting inhaled beta2-agonist. **Alternative Treatment:** - Low-dose inhaled corticosteroid and either theophylline or leukotriene receptor antagonist. If needed: - Medium-dose inhaled corticosteroid and either theophylline or leukotriene receptor antagonist.
4.	Severe Persistent Asthma	**Preferred Treatment:** - High-dose inhaled corticosteroid AND - Long-acting inhaled beta2-agonist AND, if needed, Corticosteroid tablets or syrup long-term (2 mg/kg per day, generally not to exceed 60 mg per day). (Make repeat attempts to reduce systemic corticosteroid and maintain control with high-dose inhaled corticosteroid.) **Alternative Treatment:** - High-dose inhaled corticosteroid AND - Sustained release theophylline to serum concentration of 5–12 mcg/mL.

For moderate persistent asthmatic pregnant women, combination of low dose inhaled corticosteroid and long-acting inhaled beta-2-agonist were generally prescribed but the patient with recurring severe exacerbations, combination of medium dose inhaled corticosteroids and long-acting inhaled beta-2-agonist was most commonly recommended. Study also revealed that a combination of low dose inhaled corticosteroid and either theophylline or leukotriene receptor antagonist were used as alternative treatment for

moderate persistent asthma. A combination of three or more than three types of anti-asthmatic drugs was prescribed to treat severe persistent asthma. High dose inhaled corticosteroid, long-acting inhaled beta2-agonist and corticosteroids syrup or tablets combinations were prescribed for severe persistent asthmatic patients. An attempt also made to find out the most commonly prescribed drugs brand name in Uttar Pradesh (Meerut, Mathura, Allahabad, Banaras, Shahjahanpur), Delhi, Rajasthan (Jaipur) and Haryana (Palwal) territories of India (Table-7). And the study revealed that Periphilin, Asthlin and Budamate were the most commonly prescribed brand name.

Table-7: Prescribed Medicines for Asthma in Different Territories

S. No.	STATE	Medicine Name	Composition	Dosage Form
1.	**Mathura Meerut Allahabad Jaunpur Shahjahanpur (Uttar Pradesh)**	• **Deriphylin** • **Budamate** • **Asthlin** • **Doxofylline**	• Etophyllin+Theophyllin • Formeterol Fumerate+Budesonide • Salbutamol • Doxophylline	Tablet Rotacap & Inhaler Tablet & Inhaler Tablet
2.	**Delhi**	• **Budamate** • **Advir** • **Deriphylin** • **Asthlin**	• Formeterol Fumerate+Budesonide • Fluticasone + Salmeterol • Etophyllin+Theophyllin • Salbutamol	Rotacap & Inhaler Inhaler Tablet Tablet & Inhaler
3.	**Jaipur (Rajasthan)**	• **Deriphylin** • **Asthlin**	• Etophyllin+Theophyllin • Salbutamol	Tablet Tablet & Inhaler
4.	**Palwal (Haryana)**	• **Deriphylin** • **Asthlin** • **Budamate**	• Etophyllin+Theophyllin • Salbutamol • Formeterol Fumerate+Budesonide	Tablet Tablet & Inhaler Rotacap & Inhaler

CONCLUSION

Asthma contributes to significant morbidity and mortality. A diagnosis of asthma should be suspected in patients with recurrent cough, wheeze, chest tightness and dyspnea and should be confirm by using diagnosis tests. Number of therapies is available for different case of asthma. Combination therapy is best proven therapy find in the survey done in different

territories. Number of drugs is available to prescribe in combination in India. Among them, combination of Etophyllin & Theophylline and Salbutamol Inhalation are highly prescribed in India. Inhalation is best fit in severe and emergency conditions because of its fast mode of action.

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REFERENCES

1. The Global Asthma Report 2014 http://www.globalasthmareport.org/?q=the-challenges-ofmanaging-asthma/national-asthma-management-guidelines
2. Fact sheet of asthma. World health organization, updated on April 2017. http://www.who.int/mediacentre/factsheets/fs307/en/
3. Kant S. Socio-economic dynamics of asthma. Indian J Med Res. 2013;138:446–8.
4. World Asthma Day: India chokes, sales of medicines rise 43% in 4 years. Hindustan times, updated: May 02, 2017. http://www.hindustantimes.com/health/worldasthma-day-india-chokes-sales-of medicines-rise-43-in-4-years/storymt5V9Kdqv4yGF062ZOmC6I. html)
5. India Has 10% of World's Asthma Patients: Survey. News 18.com, updated on May 3, 2016. http://www.news18.com/news/india/india-has-10-of-worlds-asthma-patientssurvey-1238186.html
6. World Health Organisation's ambient air pollution database http://www.who.int/phe/health_topics/outdoorair/databases/en/
7. Krishnakumar A. The silent tormentor. Frontline 2003; 20 Supp117:16-29.
8. Dartnell J. Activities to improve hospital prescribing. Australian Prescriber 2001; 24: 29-31
9. Breheuy Patrick, Introduction to biostatics: Prospective, retrospective and cross sectional studies: April 3, page no. 7.
10. Kumar Viney et.al., Basic Pathology, edition 7th, published by ELSEVIER, page no. 455-458.
11. Asthma and allergy foundation of America, New England Chapter 2017. www.asthmaandallergies.org/asthma-allergies/adult-onset-asthma
12. Myoclinic, Childhood asthma. www.myoclinic.org/diseasecondition/childhoodasthma
13. National Asthma Education and Prevention Program. www.healthline.com/health/pregnancy/pragnancyinducedasthma
14. Kim and Mazza allergy, Asthma and Clinical Immunology 2011, 7(ssupp1):S2 www.aacijournal.com/content/7/s1/s2
15. www.emedicine.medscape.com/article/296301-guidelines
16. Samuel H. Hurwitz, Non allergic asthma-Differential diagnosis and treatment, western journal of medicines, 1955 Aug:83(2):61-67