PRESRIBING PATTERN OF DRUGS AND MEDICATION ADHERENCE IN ASTHMA PATIENTS AT TERITIARY CARE HOSPITAL

Abhishek J [1], Anand Krishna C[1], Ameen Khan[1], Manohara Y M[1], Merin Susan Abraham[2]

Department of Pharmacy Practice, The Oxford college of Pharmacy, Bengaluru, India.

*Corresponding Author
Name   : Merin Susan Abraham
Address: Professor of Pharmacy Practice,
The Oxford College of Pharmacy, Hongasandra,
Bangalore-560068, Karnataka, India.

ABSTRACT

Objectives: To assess the prescribing pattern of the drugs in Asthma patients and to evaluate the medication adherence by using MARS questionnaires upon counselling in tertiary care hospital.

Methods: It is a prospective cross-sectional study, which is carried out in the pulmonology department of The Oxford Medical college hospital and research center with 80 Patients with Asthma. Consent was taken, and information was collected through a data entry form and patient casefile between May 2022 and October 2022. The prescription pattern was analysed using The global initiative for asthma (GINA) guidelines and medication adherence was analysed using Medication adherence rating scale (MARS) and a follow up was conducted after 2 weeks.

Result: A total of 80 patients were evaluated for this study. 62.5% of the patients were male and 37.5% were female. 70% of the prescriptions were in accordance with GINA guidelines and the medication adherence of the patients pre and post-counselling and the response revealed that the mean adherence score pre-counselling was found to be 4.712 and post-counselling score rose to 7.15.

Conclusion: This study demonstrated that 70% of the prescription were in accordance to the GINA guidelines and the medication was found to be improved post counselling.

INTRODUCTION

Asthma is a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role. In susceptible individuals, inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness, and coughing. These episodes are usually associated with airflow obstruction that is often reversible either spontaneously or with treatment. The inflammation also causes an increase in bronchial hyperresponsiveness (BHR) to a variety of stimuli.[1 Globally, asthma is ranked 16th among leading causes of burden with disability and 20th among the leading causes of burden of disease, as measured by disability-adjusted life years. Asthma is classified into two types extrinsic and intrinsic. Extrinsic asthma is mostly responsible for family history,

specific allergens and strongly raised immunoglobulin E (IGE)7. Increased IGE antibodies in the blood will result in antigen antibody reaction in mast cells of the lungs that causes degranulation of different chemical mediators like histamine, serotonin, cysteinyl leukotrienes, cytokines, adenosine, and neuropeptides 8 9. Prescription Patterns explain the extent and profile of drug use, trends, quality of drugs, and compliance with regional, state or national guidelines like standard treatment guidelines, usage of drugs from essential medicine list and use of generic drugs. Generally preferred guidelines for prescribing in asthma patients are GINA 2021 GUIDELINES (THE GOBAL INITIATIVE FOR ASTHMA) GINA was established by WHO and NHLBI in 1993. Medication adherence is the Patients conformance with the provider's recommendation with respect to timing, dosage, and frequency of medication-taking during the prescribed length of time.

METHODS

Study type: A prospective cross-sectional study on prescribing pattern and medication adherence in asthma patients.

Study location

The clinical study was conducted on the inpatients and outpatients admitted in the pulmonology department of The Oxford Medical College hospital and Research Centre, Attibele, Bangalore.

Duration of clinical study

This study was conducted for minimum 6 months of duration from MAY 2022 to OCTOBER 2022.

Study source:

- Informed consent form
- Patient case records
- MARS questionnaires
- Patient interview

Sampling calculation and Sampling method

Based on the prevalence [5] rate of Asthma the sample size was calculated based on the standard formula for a cross sectional design.[6] A calculated sample size of 80 patients were included in the study through Simple random sampling technique.

Inclusion criteria

- Both Inpatients and Outpatients with asthmatic condition.
- Patients with asthma condition aged above 12 years.
- Both male and female patients.

Exclusion criteria

- Pregnant/lactating women.
- Subjects with other respiratory disease.
- Subjects with cardiac and cardiovascular disease.
  ### Ethical approval
  This study was initially approved by the Institutional Ethics Committee of The Oxford Medical College Hospital and Research Centre, Attibele, Bangalore. (Reference number: IEC/TOMCHRC/202/2022-23)

Results:

A total of 80 patients were selected based on inclusion criteria. **Table 1** shows the demographic characteristics of Asthmatic patients. In our study 62.5% were male and 32.5% were female. The maximum number of patients enrolled were in the age group 63-72 years counting 22 patients (27.50%) of the subjects and the least number of patients fell in the age groups 13-22 years and 73-82 years each counting only 5 patients (6.25%). Out of 80 patients 27 (33.75%) patients were smokers and 15(18.75%) were alcoholic. Based on educational qualification most of the patients were found to be illiterates (53.75%), followed by matriculates (37.50%) and Graduates (8.75%). The occupational data shows that most number of subjects in the study were self-employed (18.75%) followed by farmers (13.75%), House wives/unemployed (25%), day laborers, students (11.25%), Drivers (8.75%), housekeeping (6.25%) IT employees and garment workers (2.5%).

Table 1 : Demographic characteristics of Asthmatic patients

Characteristics (n = 80)	n	%
Gender		
Male	50	62.5%
Female	30	37.5%
Age in years		
13-22	5	6.25%
23-32	7	8.75%
33-42	8	10%
43-52	11	13.75%
53-62	10	12.25%
63-72	22	27.50%
73-82	5	6.25%
83-92	12	15%
Social Habits		
Smokers	27	33.75%
Non-smokers	53	66.25%
Alcoholic	15	18.75
Non-alcoholic	65	81.25%
Educational Qualification		
Matriculates	30	37.50%
Graduates	7	8.75%
Illiterates	43	53.75%
Occupation		
Day labourer	9	11.25%
Driver	7	8.75%
Farmer	11	13.75%
Garments	2	2.50%
House keeping	5	6.25%

It employee	2	2.50%
Self employed	15	18.75%
Student	9	11.25%
Unemployed	20	25%

Table 2 : Route of administration of Anti - asthmatic drugs

ROUTE	COUNT
Oral	147
Parenteral	19
Nebulizer	136

The most frequently administered route was found to be oral with 48.67% followed by nebulization route (45.03%) and parenteral route (6.30%).

Table 3 : Severity level of Asthma based on symptoms

SEVERITY LEVEL	NUMBER OF PATIENTS	PERCENTAGE
Mild	21	26.25%
Persistent mild	28	35.00%
Persistent moderate	19	23.75%
Persistent severe	12	15.00%

The patient classification based on severity of symptoms, cough and wheezing reflecting 'Mild' condition, shortness of breath reflecting 'Persistent mild', Difficulty breathing reflecting 'Persistent moderate' and Breathlessness along with chest tightness reflecting 'Persistent severe' condition. Most patients fell under **Mild Persistent** category (35%), followed by **Mild** (26.25%), **Persistent Moderate** (23.75%) and **Persistent Severe** (15%).

Table 4: Drugs prescribed for Asthma

DRUGS	COUNT	PERCENTAGE
Neb.levosalbutamol+ipratropium	76	34.86%
Etophylline+theophyllin	26	11.92%
Montelukast+levocetirizine	22	10.09%
Azithromycin	14	6.42%
Budesonide	41	18.80%
Formotenide+budesonide	4	1.83%
Hydrocortisone	11	5.04%
Bromohexine, guaiphenesin, menthol, terbutalin Hcl	24	11.01%

Among the drugs prescribed to treat asthma the combination drug levosalbutamol + Ipratropium was the most frequently prescribed medication, which was given 76 times accounting for 34.86% of total number of medications prescribed, followed by Budesonide which was prescribed 41 times constituting 18.80%, etiophyllin+theophylline (11.92%), Ascoril (11.01%), montelukast+levocetirizine (10.09%), azithromycin (6.42%), hydrocortisone (5.04%), Formoterol+budesonide (1.83%).

Table 5: Category wise distribution of Asthmatic drugs

CATEGORY	NUMBER OF PATIENTS	PERCENTAGE
Corticosteroids	79	45.93%
Beta2-agonists + anti-cholinergics	73	42.24%
Leukotriene antagonists + anti-histaminic	16	9.30%
Beta2-agonists + corticosteroids	4	2.32%

In observation among the 172 drugs prescribed for asthma corticosteroids (45.93%)were most frequently prescribed followed by the combination drug beta2-agonists+anti-cholinergics(42.24%),leukotrieneantagonists+anti-histaminics (9.30%) and beta2-antagonists(2.32%).

Table 6 : Prescription Guidelines according to GINA Guidelines

GINA TREATMENT STEPS	NUMBER OF PATIENTS	PERCENTAGE
Step 1(SABA)	4	3.57%
Step 2(ICS + SABA)	24	35.71%
Step 3(ICS + SABA +LTRA)	27	39.28%
Step 4(ICS + LABA + LTRA + LAMA)	18	17.85%
Step 5(ICS + LABA + Macrolides + OCS)	7	3.57%

Drugs prescribed according to GINA guidelines, which revealed that 56 prescriptions were according to GINA guidelines and the remaining 24 prescriptions were not according to GINA guide lines.

Table 6 : Medication Adherence of Asthmatic patients using MARS Tool

MEDICATION ADHERENCE	SCORE
Pre-counselling	4.712
Post-counselling	7.15

The below graph shows medication adherence of MARS questionnaire, before counselling score was 4.72 and after counselling the medication adherence score increases to 7.14, and also increases patient medication adherence.

Discussion :

This study was performed to evaluate the prescribing pattern of drugs according to GINA guidelines and to measure medication adherence using MARS questionnaire in Asthma patients attending the tertiary care hospital. Prescribing pattern plays a vital role in providing proper therapy to the patients and medication adherence helps to maintain the compliance with medication and to reap the maximum benefits of treatment.

In this study we use the GINA guidelines to assess the prescribing pattern of asthma drugs as it is globally followed guidelines to treat asthma and medication adherence is measured using the MARS questionnaire.

In the current study, 80 patients were enrolled from the general medicine department and pulmonology department. The demographic characteristics of our study shows that the maximum number of patients enrolled were belonging to the age group of 43 – 72 years (53.50%) and the mean age was found to be 56 years. The results were similar to the study conducted by **Hesham tarraf et al, 2018** assessed "the asthma control in middle east", concluded that out of 7179 cases 3356 (46.74 %) patients belong to the age group of 30- 60 years, whose mean age was 45 years.
In this study among the enrolled 80 patient's majority of the patients were male (62.50 %) compared to females (37.50%) revealing that male are more prone compared to female patients..

In this study majority of the drugs were administered orally i.e (48.67%) followed by nebulization route (45.03%) and parenteral route(6.30%). The results are similar to the study conducted by **Awinash pandey et al, 2010** assessed the prescription pattern in asthma therapy in Gorakhpur, concluded that the drug administered in oral route was 56.3% and the drug inhalation was 33.8% respectively. We knew that inhalational route shows high local delivery with increasing therapeutic response and minimize systemic side effects. According to guidelines inhalational route should be the first choice but in our study only 45% are under inhalational route which may be due to the non compliance of patients towards nebulizers .

This study revealed that among the drugs prescribed for asthma 34.86% of the prescribed drugs were Nebuliser levosalbutamol + ipratropium, 11.92% of drugs were etophylline and theophylline, 10.09% of drugs were montelukast + levocetirizine, 6.42% were azithromycin, 18.80% were budesonide, 1.83% were budesonide + formotenide. The results are similar to the study conducted by **Awinash pandey et al, 2010** assessed the prescription pattern in asthma therapy in Gorakhpur, concluded that the total number prescription, 40% Beta agonist were found followed by 27% methylxanthine, 25% corticosteroids and 44% leukotriene antagonist were found respectively.
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Among the 172 total drugs prescribed the drug were categorized as 45.93% of drugs were corticosteroids, 42.24% were combination of Beta-2-agonist + anti-cholinergic, 9.30% were combination of leukotriene antagonist + anti histamines, 2.32% were combination of Beta2 agonist+ corticosteroids. The results are similar to the study conducted by **Awinash pandey et al, 2010** assessed the prescription pattern in asthma therapy in Gorakhpur, number prescription, 40% Beta agonist were found followed by 27% methylxanthine, 25% corticosteroids and 44% leukotriene antagonist were found respectively.

The study revealed that the among 80 prescriptions analyzed 56 prescription was found to be in accordance with the GINA guidelines and 24 prescriptions were not in accordance with GINA guidelines.

The study assessed the medication adherence of the patients pre- and post-counselling, the response revealed that the mean adherence score during pre-counselling was found to be 4.712 and the post-counselling score improved to be 7.15 respectively. Out of 80 patients, 27% people are in the age group of (63-72) whose medication adherence score showed very less compared to other age groups. Out of 80 patients, 63% of people were male and 37% patient were female. 43% patients were illiterate showing least medication adherence score than literate patients.
The results are similar to the study conducted by **Monica bidwal et al,2017** assessed the medication adherence rate in asthma patients concluded that one-third of individuals were identified with medium high adherence to asthma medications, of which only 8.3% of individuals were found to be fully adherent. 66.1% were low adherent whereas in our study 19.3% patients were highly adherent and 80.7% were low adherent.

CONCLUSION

From this study it is concluded that majority of the prescriptions in our hospital are strictly adherent to GINA guidelines. Evaluation of prescription pattern helps to analyze the commonly prescribed drugs and its efficacy which will help the healthcare professionals to follow the practice of prescribing drugs with higher efficacy and safety of the patient resulting in the improvement of health of the patient. The study also assessed the medication adherence of the asthmatic patients which revealed moderate adherence among 80 patients **.**

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