

RESEARCH ARTICLE

Prescribing Pattern of Drugs Used For Respiratory Disease in Pediatric Patients at Private Hospital

P. Geetha*, M. Kousalya*, S. Geetha Lakshmi, R. Gopi.

Department Of Pharmacy Practice, School of Pharmaceutical Sciences, Vels University, TN, India.

*Corresponding Author E-mail: geethaoctober1978@gmail.com

ABSTRACT:

Aim: The prescribing pattern of drugs used for the treatment of respiratory disease in pediatric patients at private hospital was studied.

Methods: The observational study was conducted in the pediatric clinic, during which prescriptions were analyzed.

Results: A total of 74 patient's prescriptions were analyzed. Average number of drugs prescribed per prescription was 4.20. In that 43 (58.1%) patients were male and 31 (41.9%) patients were female. The study showed that (37.2%) of patients among children were prescribed with syrup, 27.1% with drops, 15.5% with nebulizer, 10.1% with tablet, 9.3% with inhaler and 0.8% with injection of anti-respiratory drugs. The drugs accounted for over 22%, 14.7% and 14% of prescriptions, included antibiotics, anti-histamines and β_2 agonists respectively. It has been seen that 10.8% were received two drug therapy, 25.7% were received three drug therapy, 32.4% were received four drug therapy, 25.7% were received five drug therapy, and 5.4% were received six drug therapy. Major anti-asthmatic drugs prescribed were Salbutamol (33.61%), Montelukast (29.3%), Prednisolone (17.6%), Inhaled corticosteroids (15.1%) and Deflazacort (4.20%).

Conclusion: Thus it can be concluded that the present prescribing pattern of anti-asthmatics does not meet the standard guidelines for asthma treatment. Hence there is a need of awareness amongst the Physicians. Also the patients must be encouraged to complete whole treatment for improving the health. It has been also concluded that a study may be more meaningful to further improve the dispensing practices of the pharmacist.

KEYWORDS: Pediatric, Four drug therapy, Anti-asthmatics.

INTRODUCTION:

Asthma is a disease of airway inflammation and airflow obstruction characterized by the presence of intermittent symptoms including wheezing, chest tightness, dyspnoea and cough together with bronchial hyper-responsiveness. In India, 3-5% pediatric population is affected by asthma whereas in adults the prevalence ranges from 3-11%.^[1, 2] Asthma is of two types extrinsic and intrinsic. Extrinsic type of asthma is primarily due to aeroallergens. This type is more common in children. Intrinsic type of asthma occurs due to allergies or infections of unknown etiology and more common in adults.^[1]

Asthma is a chronic disease resulting in high mortality and morbidity in today's world.^[2] Long-term treatment is generally required for an effective management, which has an effect on the cost of the therapy and patient's compliance.^[2, 3] The characteristic path physiological changes in asthma involve several inflammatory cells and mediators that contribute to symptoms. Structural cells of the airways also produce inflammatory mediators, and contribute to the persistence of inflammation in various ways.^[4] Over 100 different mediators are now recognized to be involved in asthma and the key mediators are chemokines, leukotrienes, cytokines, histamine, nitric oxide and prostaglandins.^[4] The goal of asthma treatment is to achieve and maintain clinical control. Clinical studies have shown that asthma can be effectively controlled by intervening to suppress and reverse the inflammation as well as treating the

broncho constriction and related symptoms.^[4] Medications to treat asthma can be classified as controllers or relievers. Controllers are medications taken daily on a long-term basis to keep asthma under clinical control chiefly through their anti-inflammatory effects. They include inhaled and systemic glucocorticoids, leukotriene receptor antagonists, long-acting inhaled β_2 -agonists in combination with inhaled glucocorticoids, sustained-release theophylline, anti-IgE, and other systemic steroid-sparing therapies. Inhaled glucocorticoids are the most effective controller medications. Relievers are medications used on an as-needed basis that act quickly to reverse bronchoconstriction and relieve its symptoms. They include rapid-acting inhaled β_2 -agonists, inhaled anticholinergics, short-acting theophylline, and short-acting oral β_2 -agonists. Thus these medications that control and relieve asthma can be used for prophylaxis and treatment of acute episodes.^[4]

Drugs use in pediatrics is a unique dilemma in the management and monitoring of disease since these age groups are unique population with respect to how they metabolize, excrete, and respond to drug therapy. The administration of drugs to children requires special knowledge and expertise primarily because the doses prescribed for children are often in an amount of which is not commercially available in pediatric level.^[5] Many studies have been done to document drug use pattern, and most of these indicated that over prescribing, multi prescribing, use of unnecessary expensive drugs, a use of drugs unrelated to diagnosis, overuse of antibiotics and injections were most common problems of irrational drug use in pediatric patients.^[5] Asthma is a leading cause of illness in childhood and can lead to psychological disturbances in family. Statistics says 10%-15% of boys and 7-10% of girls may have asthma at some time during childhood.^[6] Asthma affects an estimated 300 million individual's world wide the prevalence of asthma is increasingly specially in children's. Epidemiological evaluation of medicine use in the elderly is now a highly visible topic, but drug utilization studies in pediatrics population have been limited.^[6]

Infants and children represent a large part of the population in the developing countries. Pediatric population is prone to suffer from recurrent infections of the respiratory tract and gastrointestinal system. Lower respiratory tract infection are the leading cause of death in children below 5 years of age, acute respiratory infection, acute watery diarrhea and viral fever are the common childhood illness accounting for the major proportion of pediatric visit.^[7] Drug utilization audits are qualitative assurance programs to ensure that drugs are used correctly and safely. The nature of such audits can

be quantitative or qualitative or combination of both. Quantitative audit are concerned with quantifying various facts of drugs therapy use within a health care system or area or group where as qualitative audits compare drug use or practice with predetermined standards or criteria.^[1,2]

METHODOLOGY:

Study nature:

The study was an observational study; descriptive survey conducted using a specially designed data entry format.

Place of study:

The study was conducted in Porur child hospital. It also equipped with X-ray room, Nebulizer section, waiting hall with charts and toys for children.

Study design:

The study was conducted between Nov2014 –July2015.

Patient selection:

Patients aged less than 12 years, diagnosed as patients of respiratory disease were selected for this study. Informed consent form was obtained from each patient's parent/guardian.

Sample size:

The study included 74 patients who confirmed to the following predetermined inclusion and exclusion criteria.

Inclusion criteria:

- Patients of either sex
- Within the age limit 1-12 years
- Wheezing, chronic dry nocturnal cough and episodes of spasmodic group

Exclusion criteria:

- Patients greater than 12 years
- Patients who are suffering from other systemic disorders
- Exclusion of disease such as cystic fibrosis, inhaled foreign bodies and infectious bronchiolitis.

RESULTS AND DISCUSSION:

Bronchial Asthma is a disease of airway inflammation and airflow obstruction leading to bronchospasm characterized by the presence of intermittent symptoms including wheezing, chest tightness, dyspnoea and cough together with bronchial hyper-responsiveness. It is a serious public health problem affecting both children and adults. In India, 3-5% pediatric population is affected by asthma whereas in adults the prevalence ranges from 3-11%.^[1] Asthma affects an estimated 300 million individual's world wide the prevalence of asthma is increasing specially in children. Asthma is a chronic disease resulting in high mortality and morbidity

worldwide. When uncontrolled, asthma can place severe limits on daily life and is sometimes fatal. So, proper prescribing patterns need to be followed in order to reduce the burden of disease in terms of morbidity, mortality and betterment in the quality of life. The present study was aimed to assess the prescribing pattern of drugs in respiratory disease to generate data with respect to the extent of variability of drug usage among pediatric groups. In present study prescriptions of 74 pediatric patients were studied. On analysis of the prescriptions, it was found that asthma was reported more in male children (58.1%) as compared to female children (41.9%) (Table no1).

Table 1: GENDER CATEGORISATION

SEX	NO.OF PRESCRIPTION (n =74)	PERCENTAGE(%)
Male	43	58.1
Female	31	41.9

Primary prevention includes creation of a productive environmental situation, leading healthy life-style, elimination of environmental factors. Early detection of atopy and the causal allergens, including food, prevention of the development of viral infections, treatment of atopic dermatitis, allergic rhinitis, etc. are important components of primary prevention. Reduction of allergen exposure, leading to subsidence of inflammation and hyperactivity in bronchi belongs to secondary prevention. Since the quality of indoor environment is potentially modifiable there might be opportunities for intervention to reduce asthma symptoms. In order to counteract the increasing prevalence in asthma, the significance of the indoor environment where children spend most of their time need to be given greater attention.

In our study 10.8% of children were prescribed two drug therapy, 25% children were prescribed Three drug therapy 32.4% of children were prescribed Four drug therapy (Table no3). The drugs prescribed for asthmatic patients were β_2 agonist salbutamol (33.61%), followed by Leukotriene antagonist Montelukast (29.31%) (Table no 4). A study conducted at Dehradun, India, reported that (84%) asthmatic patients were on multiple drug therapy and only 16% patients were on single drug therapy .The result of this study demonstrates similar prescribing pattern in comparison to published studies. Among those children treated with multiple drug therapy, three drug combinations were more widely prescribed (41%) than two drugs (35%) or four drug (12 %) combination. All the drugs were prescribed by their brand names. The overall utilization of Anti-asthmatic drugs among paediatric asthma patients were found to be β_2 Agonists (96%), Inhalational Corticosteroids (74 %) and leukotriene modifiers (16 %). Salmeterol among children was the most commonly used LABA, while Budesonide, Fluticasone were the more widely used ICS.

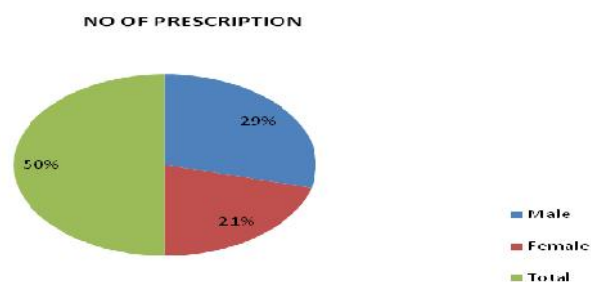
The results demonstrate that mast cell stabilizers are not used much clinically. They have been overshadowed by the other anti-asthmatic medication. [2] A similar study conducted at Gorakhpur hospitals, the study reported that β_2 agonist (40%), were the most frequently prescribed anti asthmatic drugs followed by methylxanthines (27%), corticosteroids (25%), leukotriene antagonist (4.4%), and anti histaminics (3.6%). Analysis of prescription revealed that multidrug therapy (81%), single drug therapy (19%), oral dosage form tablets (56.3%), inhalation (33.8%). [1]

The Similar study carried at Tertiary care hospital, India". The prescription data of 125 asthmatic patients was analyzed and reported that Allergic factors have seen to be responsible for precipitating asthma in 48% of patients. All the patients received multiple drug therapy at an average of 3.632 drugs per patient. Short acting β_2 agonists were the most commonly prescribed group of anti-asthmatic drugs (68%) followed by methylxanthines (66.4%), antihistaminics (38.4%), leukotriene receptor antagonists (1.6%) and oral corticosteroids (2.4%). Inhalational therapy was prescribed to 50.4% of patients. Anti asthmatic drugs given as inhalational therapy are more beneficial to the patients than systemic therapy. [3] The present study shows results that 37.5% of children were prescribed syrup, 27.1% of children were prescribed drops, 15.5% of children were prescribed Nebulizer, 10.1% of children were prescribed Tablet, 9.3% of children were prescribed Inhaler and the least prescribed was injection at 0.8% .The oral route was the highest prescribed in numbers (74.4%), Nasal route (25.6%), injection (0.8%). (Table no 2).

Table 2: DOSAGE FORM OF RESPIRATORY DRUGS

DOSAGE FORM	NO. OF DOSAGE FORM (n =129)	PERCENTAGE (%)
Syrup	48	37.2
Drops	35	27.1
Nebulizer	20	15.5
Tablet	13	10.1
Inhaler	12	9.3
Injection	01	0.8

The overall prescribing patterns for respiratory disease showed that Anti-Histamines (14.7%), β_2 -agonist (14%), Corticosteroids (10.5%), Expectorant (9.1%), and least prescribed drug was Anticholinergics (0.3%). The drug utilization patterns showed that β_2 agonist were the drug of choice for the asthmatic patients, findings that were in agreement with those reported by Patel Pinal. [3] The drugs prescribed for asthmatic patients were β_2 agonist salbutamol (33.61%), followed by Leukotriene antagonist Montelukast (29.31%). The other combination drugs are Montelukast+ Levocetizine for 17 numbers of patients, levosalbutamol + Ambroxyl hydrochloride +guaifenesin for about 20 numbers of patients.



The prescription data of 74 patients were analyzed. 43(58.1%) of the patients were male children and 31(41.9%) were female children. [Table 1] [Figure 1]

Figure1: GENDER CATEGORISATION

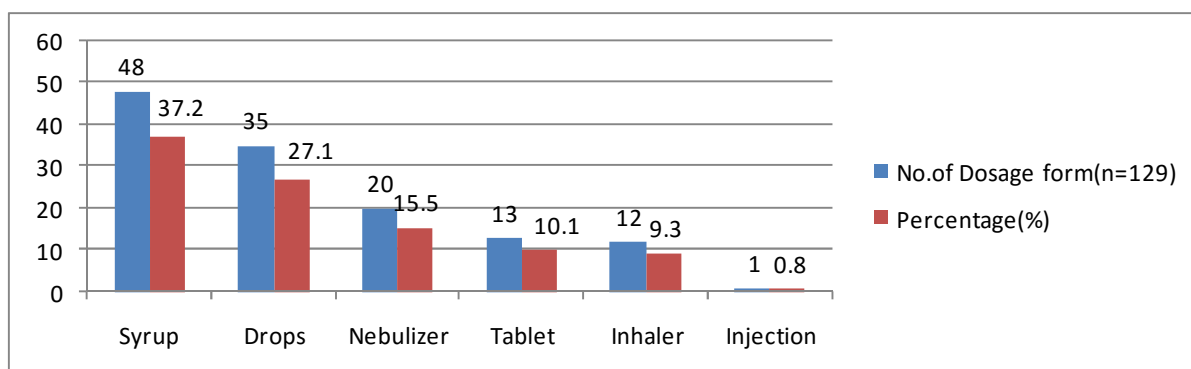


Figure 2: DOSAGE FORM OF RESPIRATORY DISEASE DRUGS

DRUG THERAPY	NO.OF PRESCRIPTION (n=74)	PERCENTAGE (%)
Single drug therapy	Nil	Nil
Two drug therapy	8	10.8
Three drug therapy	19	25.7
Four drug therapy	24	32.4
Five drug therapy	19	25.7
Six drug therapy	4	5.4

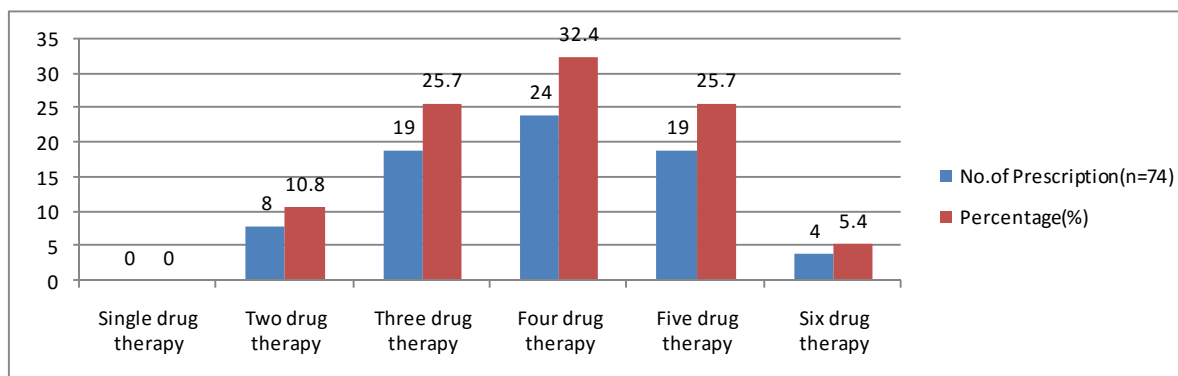


Figure 3: DRUG THERAPY REGIMEN (SINGLE/MULTIPLE DRUG REGIMEN)

MAJOR DRUGS	NO.OF DRUGS (n=119)	PERCENTAGE (%)
Salbutamol	40	33.61
Montelukast	35	29.3
Prednisolone	21	17.64
Inhaled corticosteroids	18	15.1
Deflazacort (steroids)	5	4.20

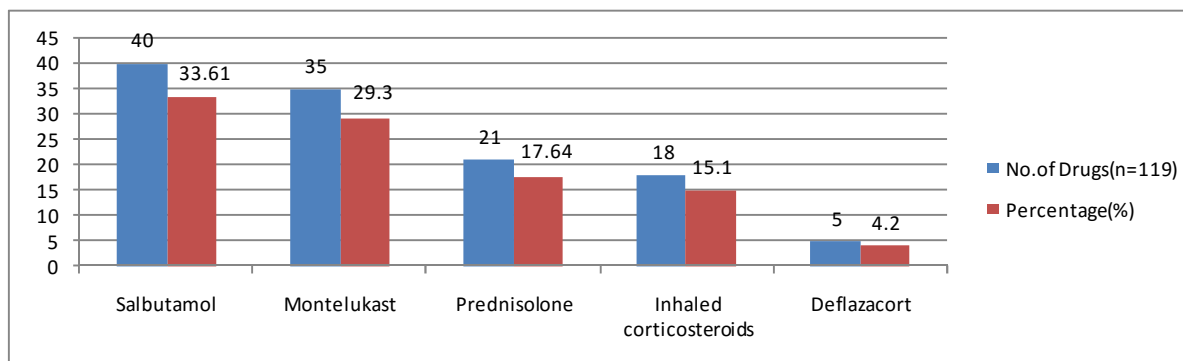


Figure 4: ANTI-ASTHMATIC DRUGS

Table 5: MAJOR DRUG CATEGORIES FOR RESPIRATORY DISEASE

DRUGS	NO.OF DRUGS (n=102)	PERCENTAGE (%)
β_2 agonist	40	39.3
Leukotrienes	32	31.3
Corticosteroids	30	29.4

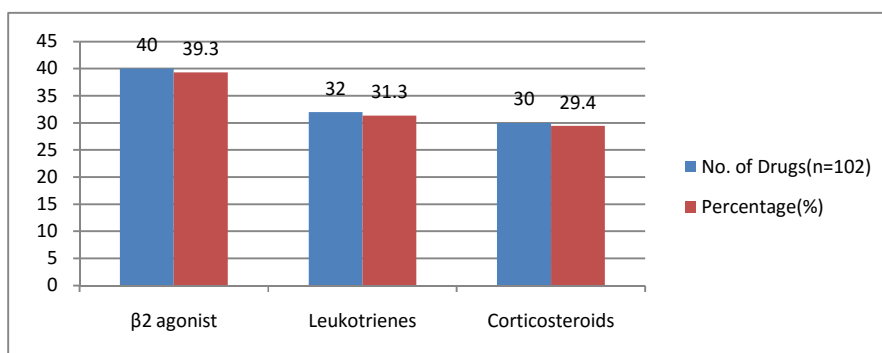


Figure 5: MAJOR DRUG CATEGORIES FOR RESPIRATORY DISEASE

Table 6: ROUTE OF ADMINISTRATION

ROUTE	NO.OF DRUGS (n=129)	PERCENTAGE (%)
Oral	96	74.4
Nasal	32	24.8
Injection	1	0.8

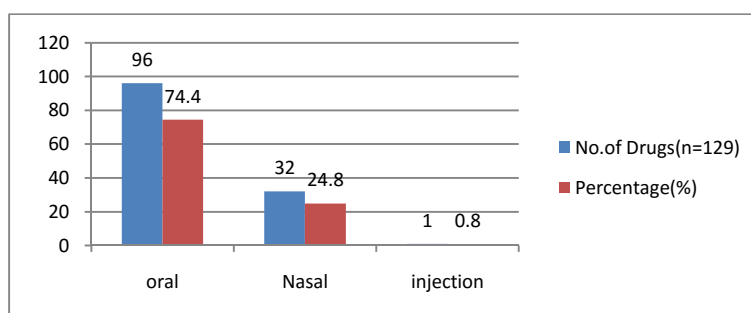


Figure 6: ROUTE OF ADMINISTRATION

Table 7: COMBINATION OF DRUGS

COMBINATION	NO. OF DRUGS (n=37)	PERCENTAGE (%)
Levosalmamol+Ambroxyl Hydrochloride+guaphenisin	20	54.1
Montelukast+Levocetizine	17	45.9

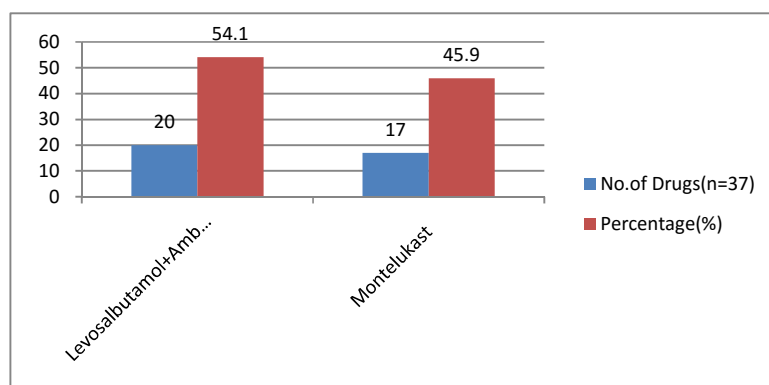


Figure 7: COMBINATION OF DRUGS

From [Table7] [Figure7] The commonly received combinations were, Levosalbutamol+Ambroxyl HCL+guaifenesin (54.1%), and Montelukast+Levocetirizine (45.9%).

CONCLUSION:

Irrational use of drug and inappropriate prescribing are the two common phenomenon in the developing countries which cause a big problem for providing health care facilities. Rational use of drug requires that patient receive medication appropriate to their clinical needs in doses that meet their own requirements for adequate period of time and cost effective. Thus, there is need for pharmacotherapeutical studies meth. A prescription based survey is considered one of the scientific methods to asses and evaluate the rationality of the prescription. According to the anti-asthmatic drugs agonist were the drugs of choice for the patients. Since asthma patients requires more than one drug for the control of symptoms hence combination are required to treat asthma. The inhalation route causes a high level local delivery therapy hence will improve the therapeutic ratio and minimize systemic side effects. The use of injection was said to be rational. It was also noticed that pharmacists usually distributed medicines with giving written or detailed oral instruction.

REFERENCES:

1. Awanish Pandey, Poonam Tripathi, Rishabh Dev Pandey. Prescription pattern in asthma therapy at Gorakhpur hospital; Lung India Vol 27, Issue 1. Jan-Mar 2010:8-9.
2. Arumugam V, Preethi Kothiyal, Vijay Juyal, Awanish Pandey, Poonam Tripathi. Drug utilization assessment in asthma therapy through prescription monitoring at Dehradun hospitals; Indian J Allergy Asthma Immunol 2008; 22(1): 15-18, 16-18.
3. T. Rajathilagam¹, Tasneem Sandozi², A.D. Nageswari³. Drug utilization study in bronchial asthma in a tertiary care hospital; International Journal of Pharmaceutical Applications; vol 3, Issue 2, 2012, pp 297-305. 297-98.
4. Patel Pinal D, Patel R.K, Patel N.J.³. Analysis of prescription pattern and drug utilization in asthma therapy; International Research Journal of Pharmacy 2012. 257-59.
5. Asrat Agalu¹ and Hailemeskel Mekonnen². Drug prescribing practice in a paediatrics ward in Ethiopian; International Research

- Journal of Pharmacy and Pharmacology; vol. 2(6) pp. 132-138 June 2012.132-33.
6. Yogesh A. Garje¹, Rajesh kumar Suman¹, Rakesh Kumar³, Y.A. Deshmukh¹, V. Patra². Prescribing patterns and pharmaco economics analysis of drugs used in paediatrics asthma patient at tertiary care hospital; World Journal of Pharmacy and Pharmaceutical Sciences; vol. 3, Issue 6, 1448-65. 1448-53.
7. N. Venkateshwara murthy, R. Murali, R. Sampath Kumar. The study of drug utilization pattern in paediatric asthma; International Journal of Pharmacy and Pharmaceutical Sciences; vol. 5, Issue 3 2013. 140-44.