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Drug Utilisation Study of Medicines Used in Pediatric Patients of Bronchial Asthma in a Tertiary Care Centre at Southern Rajasthan

Monika Gaur

Department of Pharmacology RNT Medical College, Near Court Circle, Udaipur 313003, Rajasthan, India

Abstract: ***Drug utilization plays a role in helping the health care system to understand, interpret and improve the drug use and continuous quality improvement. It plays an essential part of pharmaco- Epidemiological studies.100 prescriptions from paediatric patients with established diagnosis of acute exacerbation of Bronchial asthma were assessed from the Department of Paediatrics and the data gathered was analysed using MS Excel. A prospective cross-sectional study was done to conduct this study. Majority of the prescriptions irrespective of severity, inhalation beta2 agonist(salbutamol) as a bronchodilator was used.Nebulisation route was given for managing the acute exacerbations followed by inhalation route and oral route. Beclomethasone was prescribed to the patients suffering for severe bronchial asthma. Montelukast and levocetirizine were used for the patients suffering from allergic causes of asthma. Most of them was prescribed combination therapy.Beta2 Agonist and Leukotriene Antagonists are the most commonly prescribed combination drugs for asthma. The most commonly prescribed anti-asthmatic Medications in combination therapy was inhaled salbutamol and oral Montelukast. Nebulisation was preferred route to tackle the acute exacerbation of asthmatic symptoms.***

Keywords: Drug utilisation, beta2 agonist.

1. Introduction

Drug utilization research is defined by the World Health Organization (WHO) as the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences. Studies on the process of drug utilization focus on the factors related to the prescribing, dispensing, administering and taking of medication, and if association of events, causing the medical and non-medical determinants of drug utilization, the effects of drug utilization as well as studies of drug use, beneficial or adverse reactions. "Drug Utilization Evaluation" (DUE) or drug of pharmaco-epidemiological studies which provides a proper understanding of usage pattern of drugs, quality and efficiency of use of drugs and its outcome. DUR can play a key role in helping the health care system to understand, interpret and improve the prescribing administration and to maintain the rational use of drugs which assist the physicians prescribing attitude in accordance with the predetermined standards by allocating them with the feedback and also in designing, conducting and imparting educational program for health care providers.ASTHMA is a chronic inflammatory disorder of the airways characterized by bronchial hyperresponsiveness and airflow limitation that may vary in severity and frequency from person to person. The symptoms of asthma include: wheezing, breathlessness, chest tightness and cough. The prevalence and mortality from asthma have shown an upward trend during an era when quality medications are easily available for asthma.The use of medicines specially "Bronchodilators" for the management of asthmatic attack plays a fundamental role in controlling inflammation and relieving airway destruction. "Bronchodilators" are generally indicated for the symptomatic relief of large number of conditions like mild to moderate asthmatic attack caused by allergens; URTI, exercise, hyperventilation, cold air, pollution, stress which act as triggering factors.

2. Aims and Objectives

The present study is carried out to evaluate the drug utilization pattern of "anti-asthmatic" drugs in pediatric patients suffering from bronchial asthma in a tertiary care hospital. Such information would help in improving the quality of health care provided and to facilitate the rational use of drugs in population.To explore and describe the current pattern of drug utilization of anti-asthmatic drugs in bronchial asthma in pediatric patients.

1) Ensuring that drug therapy is of current standards of health care
2) Controlling drug cost
3) Evaluating the effectiveness of therapy

3. Material and Methods

Study Setting and Design

The present study is a prospective cross-sectional study conducted by Department of Pharmacology in association with Department of Pediatrics, M.B. Govt. Hospital, Udaipur (Rajasthan). The study wasperformed over a period of 8 months, from April 2018 to November 2018.

Inclusion Criteria

Pediatric patients up to 12 years of either sex, attending asthma clinic or OPD for the treatment of bronchial asthma.

Exclusion Criteria

- Patients > 12 years and patients who are not willing to take part in study.
- Patients who are having other co-morbidity like COPD, bronchitis etc.

Ethical Considerations and Protocol Development

An appropriate study protocol and proforma has been developed and discussed with teaching staff members of the pharmacology department and Head of Pediatrics

Department. The study protocol, proforma and other documents like informed consent form in Hindi and English will be submitted and approval of IEC.

Statistical tools like frequencies, means, SD, percentages will be applied in this study regarding average number of anti-asthmatic drugs prescribed per prescription, relationship between patient demographics and prescription patterns, indicators for which anti-asthmatic were prescribed, percentage usage of various anti-asthmatics, dosage forms, FDC, polypharmacy, route of administration etc.

4. Observation and Results

Table 1: Age wise distribution

Age (in years)	No. of patients	%
1-4 (<5)	38	38
5-8 (<9)	50	50
9-12 (<13)	12	12
Total	100	100

Table 2: Gender wise distribution

Male	Female	Total
77 (77 %)	23 (23 %)	100 (100 %)

Table 3: Grading of Asthma

Grade of asthma	No. of patients	%
Intermittent	63	63
Mild Persistent	29	29
Moderate persistent	8	8
Total	100	100

Table 4: Average number of Antiasthmatic drug per encounter

Average no. Average no. of drug per encounter (±SD)

Total no. of different antiasthmatic drug prescribed	Total no. of encounters	Average no. of drug per encounter (±SD)
264	100	2.64±0.84

Table 5: Total number of drugs prescribed per encounter

Total no. of drugs	Total no. of encounters	%
2	57	57.00
3	11	11.00
4	17	17.00
5	7	7.00
6	0	0.00
7	4	4.00
8	4	4.00
Total	100	100

Table 6: Distribution according to class of antiasthmatic drug prescribed n

Drugs prescribed	Total no. of encounters	%
SABA	200	75.6%
ICS	8	3.03%
LM	74	58.11%

o. of drug per encounter (±SD)

Table 7: Route of administration of antiasthmatic drugs (N=264)

Route	No. of antiasthmatic drugs	%
Oral	156	59.10%
Inhalation	108	40.91%

5. Result and Discussion

Prescription monitoring studies are important for obtaining data about the patterns and rationality of use, the determinants of drug use, and the outcomes of use. The WHO drug utilization indicators [1] are highly standardized and are recommended for inclusion in drug utilization studies. Average number of drugs per person is an important index of prescription audit. Mean number of drugs per prescription should be kept as low as possible. Irrational use of drug and inappropriate prescribing are the two common problems in the developing countries which cause a big hurdle for providing effective health care facilities [10]. Rational use of drug requires appropriate medications to their clinical needs in doses that meet their own requirements for adequate period of time and cost effective [11]. Thus, there is need for rational drug utilization studies. However, only a few studies have been conducted because of several constraints in India. A prescription-based survey is considered one of the scientific methods to assess and evaluate the rationality of the prescription. Now, recommendations of various international bodies on asthma which help improve prescribing practices of the physicians and ultimate clinical standard are available [5, 10] Rational use of drug requires appropriate medications to their clinical needs in doses that meet their own requirements for adequate period of time and cost effective [12]. Dose and duration were quoted in more than 90% of prescriptions as dose and duration of drug treatment is saved and auto-generated in HMIS system. Hence there are minimal chances of prescribing errors

- The demographic results of patients revealed that number of male patients outnumbered female patients
- Another reason for more male admissions in this study may be attributed to more male to female ratio in Rajasthan and in the Indian scenario. Majority of asthma patients were from age group 5-8 years.
- Allergic factors have seen to be responsible for precipitating asthma in 53% of patients in this study and most of patients belong to mild intermittent grade of asthma (GINA).
- In this study, the average number of drugs per prescription was 3.82 indicating polypharmacy.
- This prescribing trend may be attributed to the goals of asthma therapy to minimize chronic symptoms, to prevent recurrent exacerbations, to reduce the need for pulmonary function
- Analysis suggested that doctors preferred the oral formulations than the inhalational preparations. As inhalation preparations are costly so it is not feasible in government set-up to procure inhalational anti – asthmatics.
- Oral salbutamol was the most frequently prescribed anti – asthmatic drug. This may be because of easy availability and cheap anti –asthmatic medication with fewer adverse effects; hence oral salbutamol being prescribed more frequently in asthma OPD.
- Short acting β2 agonists relax airway smooth muscle and inhibit release of Broncho -constricting mediators from mast cells. They may also inhibit microvascular leakage and increase mucociliary transport by increasing ciliary activity. Even in recent times, short acting β2 agonists are

still highly preferred for asthma since they are the most effective bronchodilators which provide quick or "rescue" relief from acute asthma attacks

- Other than short acting β2 agonists, anti-histaminic (64.58%), leukotriene receptor antagonists (58.11%) were also prescribed frequently.
- These leukotriene receptor antagonists are active over a wide range of asthma severity and have both an anti-inflammatory and a bronchodilator property. They cause modest improvement in lung function, reduce asthma symptoms and lessen the need for β2 agonist rescue therapy. They are active orally, therefore overcoming the potential problems with compliance when using inhalers.
- This study also showed that antibiotics and multivitamins were prescribed as adjuvant therapy (25%). Antibiotics are highly effective against respiratory infections were commonly prescribed. These antibiotics favorably affect the bronchial hyper-responsiveness found in asthma and they also helped to improve the breathing and lung function in asthmatic patients with underlying respiratory infection
- Inhalational form is the most safe and targeted therapy in bronchial asthma. The advantages being smaller dose, targeted delivery, rapid action and minimal systemic side effects.
- But in this study also only 40.19% of patients received inhalation therapy. This could be attributed to high cost inhalational formulation than oral formulation. It is not feasible in government set – up to procure inhalational formulations of anti – asthmatics. Fixed dose inhalational therapy with a short-acting beta2 agonist and corticosteroids was prescribed in this study.
- This study has dealt basic concept and identified key areas which require modifications for rational drug use.

6. Conclusion

Majority of the prescriptions irrespective of severity, inhalation beta2 agonist (salbutamol) as a bronchodilator. Nebulisation route was given for managing the acute exacerbations followed by inhalation route and oral route. Beclomethasone was prescribed to the patients suffering for severe bronchial asthma. Montelukast and levocetirizine were used for the patients suffering from allergic causes of asthma. Most of them was prescribed combination therapy. Beta2 Agonist and Leukotriene Antagonists are the most commonly prescribed combination drugs for asthma. The most commonly prescribed asthmatic Medications in combination therapy was inhaled salbutamol and oral Montelukast. Nebulisation was preferred route to tackle the acute exacerbation of asthmatic symptoms.

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