

A retrospective study on drug utilization in patients with acute exacerbation of bronchial asthma in adults at tertiary teaching hospital in Bidar

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ABSTRACT

Background: 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.

Methods: 100 prescriptions from patients with established diagnosis of acute exacerbation of Bronchial asthma were assessed from the Department of Pulmonary Medicine and the data gathered was analysed using MS Excel.

Results: Majority of the prescriptions irrespective of severity received inhalation β_2 agonist (formoterol) as a bronchodilator. Nebulization route was given for managing the acute exacerbations followed by inhalation route. Hydrocortisone was prescribed to all patients for managing acute Exacerbations. Montelukast was used an adjuvant therapy. Most of them were prescribed combination therapy. Theophylline was prescribed among all the methylxanthines.

Conclusions: β_2 agonists Combinations and corticosteroids are the most commonly prescribed combination drugs for asthma followed by methylxanthines. The most commonly prescribed asthmatic Medication in combination therapy was inhaled salbutamol with ipratropium followed by intravenous Hydrocortisone and oral Montelukast. The most commonly prescribed methylxanthine was intravenous Theophylline. Nebulization was preferred route to tackle the acute exacerbation of asthmatic symptoms.

Keywords: Bronchial asthma, Beta-2 agonist, Drug utilization studies

INTRODUCTION

WHO defines drug utilization research as “marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences.” DUR (drug utilization review) plays a key role in understanding the health care system, to improve and interpret the prescribing administration and to maintain the rational use of drugs which assist the physician’s attitude in prescribing in accordance with predetermined standards by allocating them with feedback. It plays an important role in part of pharmacoepidemiological studies which provides a proper understanding with the usage pattern, quality, efficiency of drugs and its outcome.^{1,2}

Asthma is a syndrome characterized by chronic airway inflammation and increased airway hyper-responsiveness leading to symptoms of wheeze, cough, chest tightness and dyspnoea. It is characterized functionally by the presence of airflow obstruction which is variable over short periods of time, or is reversible with treatment. There are several inflammatory mediators that contribute the characteristic pathophysiological changes that lead to symptoms of asthma. Current estimates suggest that 300million people world-wide suffer from asthma.³ In India it is estimated to be 15-20 million, morbidity and mortality comprising about 3-11% of adults, 3-5% of paediatric population.⁴

According to GINA(Global Initiative for Asthma) guidelines, different group of drugs are suggested for the

treatment of asthma that includes long and short acting beta2 agonist (salbutamol, salmeterol, formoterol), corticosteroids (fluticasone, prednisolone, budesonide), xanthine derivatives (theophylline) and leukotriene receptor antagonist (montelukast). These drugs are either used alone or in combinations with antiasthmatic drugs⁽⁵⁾. Keeping this in the background the present study was to determine drug utilization pattern for managing acute exacerbation of bronchial asthma in adult population in a tertiary teaching hospital, BIDAR.

The aim was to evaluate drug utilization pattern in acute exacerbation of bronchial asthma among adults at a tertiary-care hospital, BIDAR.

METHODS

After taking approval from institutional Ethics Committee, a retrospective cross-sectional study was done analysing about 100 prescriptions. Patients were selected on the basis of inclusion and exclusion criteria i.e. patient aged more than 18 years diagnosed with acute exacerbation were included and patients having other respiratory problems like COPD, cardiac problems were excluded from this study.

Case records of the patients were assessed from the Department of pulmonary medicine at BRIMS teaching hospital, BIDAR. The data collection form provides the information regarding demographic details of the patient which includes age, sex, occupation, past history, family history and drug prescription which includes the drugs prescribed, route, dosage form, frequency. The percentage of all observed data was calculated.

RESULTS

Demographic analysis of data showed that there were 64% men and 36% women and maximum asthmatic patients were between 20-29 years of age group (Figure 1). The prescribed drugs are shown in the Table 1. The results of this study showed that most of the patients received combination therapy rather than individual therapy. Majority of the patients received combination therapy of beta 2 agonist and corticosteroids via inhalational routes.

Table 1: Asthmatic medications.

Category	Drugs
Beta2 agonists	Salbutamol, Formoterol
Corticosteroids	Hydrocortisone, Budesonide, Methylprednisolone
Methylxantines	Theophylline
Anticholinergics	Ipratropium bromide
Leukotriene modifiers	Montelukast
Antihistamins	Levocetirizine

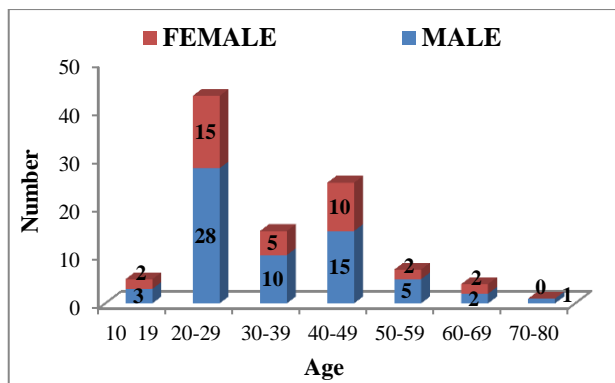


Figure 1: Demographic data of population under study.

From Figure 2 showed that salbutamol (beta 2 agonists) + ipratropium bromide (anti cholinergics) was most commonly used combinations as bronchodilator in 90% prescriptions followed by theophylline (methylxanthines) that was used in 50% of prescriptions. Corticosteroids which were in the form of hydrocortisone (60%), budesonide (52%), pre dnisolone (5%) were depicted in 100 prescriptions. Majority of the patients received montelukast (leukotriene receptor antagonist) as an adjunct treatment (55%) for the control of asthmatic symptoms. For managing of acute exacerbations nebulization route was preferred.

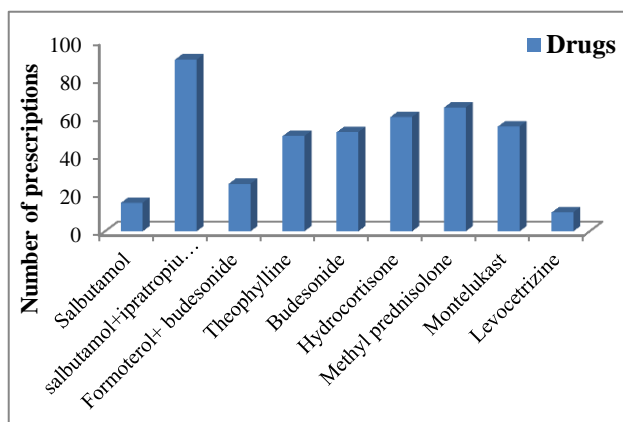


Figure 2: Prescribed asthmatic medications.

DISCUSSION

Prescription based study evaluates the rationality of the prescription. Rational prescribing practice guidelines have put forth to improve the standards of prescribing.^{6,7} In our study to manage acute exacerbations of asthmatic episodes nebulization route of drug delivery was the preferred route. Patients who are unable to use conventional inhaler, nebulizer is useful because there is little requirement of coordination from the patient as drug is inhaled through the face mask which colerates with normal tidal breathing. The main disadvantage of using nebulizer is lack of portability and long term commitment of maintenance.⁸

Inhalational therapy was however given to all patients who had treatment of acute exacerbation of bronchial asthma at the time of discharge. This is in accordance to the treatment guidelines i.e. inhalational therapy to be the first choice. Inhalational therapy provides less side effects, less dose is used and delivers more drug locally.^{9,10} Effectiveness depends upon the technique used. Patient should be adequately instructed about the technique. A study in Cochrane stated that the compliance of the patient is decreased if failed to instruct the patients on how to use the inhalers.¹¹

The most commonly prescribed inhaled bronchodilator was salbutamol with ipratropium bromide (90%) followed by formoterol with budesonide (25%) which was in coherence with study done in Bareilly which showed that inhaled salbutamol was received by 100% of patients irrespective of severity and study done in Malaysia in which salbutamol was most commonly prescribed.^{11,12} The reason for using short acting beta 2 agonist was because of its rapid onset and low cost. In our study injection hydrocortisone (60%) was used to treat acute attack of asthma, it prevents the side effects of inhalational medication which causes irritation on respiratory tract. NAEPP guidelines recommends even oral route of corticosteroid for acute attack of asthma and reported to be as effective as intravenous route.¹³ Anticholinergics were commonly prescribed with combinations rather than individual therapy as they are preferred medication for COPD instead of asthma.

Intravenous theophylline was most commonly prescribed methylxanthines. However it is not as efficacious as doxophylline. However faiz et al, concluded that there is no significant difference in spirometric variables between doxophylline and theophylline.¹⁴

Corticosteroids constituted the most commonly used medication and intravenous was the preferred route, and was prescribed in 60% of the prescriptions, in contrast to study done by Sayadeda et al., corticosteroid was given by IV route in 100% cases of severe exacerbation and some cases of severe Exacerbation were also given MgSO₄ (28.57%) for additional bronchodilatation.¹² Montelukast, a leukotriene receptor antagonist (55%) was seen in most of the prescription as add-on therapy. It was prescribed as a fixed dose combination with levocetirizine (36.8%) in a study done by Rajathilagam, et al.¹⁵ Limitations of our study were lack of follow up and cost effectiveness which should have been done. For higher authenticity more number of prescriptions should have been included in our study.

CONCLUSION

β₂ agonists Combinations and corticosteroids are the most commonly prescribed combination drugs for asthma followed by methylxanthines. The most commonly prescribed asthmatic medication in combination therapy was inhaled salbutamol with ipratropium followed by

intravenous hydrocortisone and oral Montelukast. The most commonly prescribed methylxanthine was intravenous theophylline. Nebulization was preferred route to tackle the acute exacerbation of asthmatic symptoms.

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