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ORIGINAL RESEARCH

ASSESSMENT OF DRUG UTILISATION IN PAEDIATRIC PATIENTS WITH ACUTE EXACERBATION OF BRONCHIAL ASTHMA

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ABSTRACT

Background: To assess drug utilisation in Paediatric patients with acute exacerbation of bronchial asthma.

Methods: Fifty- six paediatric in-patients of acute exacerbation of asthma of either gender were enrolled. Using the following WHO core prescribing indicators, the prescription pattern such as average number of drugs per encounter, percentage of drugs prescribed by generic name, percentage of encounters with an antibiotic prescribed, percentage of encounters with an injection prescribed and percentage of drugs prescribed from an essential drug list (EDL) or formulary was evaluated.

Results: Out of 56 patients, males were 20 and females were 36. Age group 1-5 years had 23, 6-10 years had 20, and 11-15 years had 13 patients. Residence was urban in 40 and rural in 16 cases. Positive family history was seen in 6 patients. The difference was significant ($P< 0.05$). Total number of prescriptions were 56 (100%), total number of drugs prescribed were 310. WHO core indicators was average number of drugs per encounter was 10.4, percentage of encounter with an antibiotic was 98%, percentage of encounter with an injection was 100%, percentage of drugs prescribed from essential drug list was 78%. Number of anti-asthmatic drugs prescribed (excluding other concomitant drugs) was multiple drug therapy in 56 (100%). Number of anti-asthmatic drugs prescribed by injectable route was 24%. Number of anti-asthmatic drugs prescribed by inhalational route was 50%. Number of anti-asthmatic drugs prescribed by oral route was 26%. Drugs used was SABA in 100%, corticosteroids in 100%, LTRA in 33%, SABA + Anticholinergic in 35%, anticholinergic in 5%, antibiotics in 97%, antihistamines in 74%, NSAIDs in 85%, multivitamins and multimineral in 52% and anti-reflux-agents in 64% patients.

Conclusion: The current study's observed pattern of drug usage does not entirely align with the suggested treatment guidelines for asthma. In order to guarantee the sensible use of medications in the future, concerns about brand prescription, polypharmacy, and high antibiotic prescribing rates must be addressed.

Keywords: Bronchial asthma, Anticholinergic, multivitamins, NSAIDs

INTRODUCTION

Bronchial asthma, commonly referred to as asthma, is a chronic inflammatory disease of the airways characterized by variable and recurring symptoms, reversible airflow obstruction, and bronchospasm. Childhood asthma attacks that are severe enough to need hospitalization, ED visits, and missed school are common.[1] These are primarily characterized by worsening asthma symptoms and a decline in respiratory capacity, which may necessitate modifying treatment.

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According to current estimates, there are 300 million asthma sufferers worldwide, and by 2025, that figure is expected to increase by 100 million.[2]

While asthma is very common in high-income nations, low-middle-income nations have a relatively greater death rate from the condition. Around 14% of children worldwide suffer from asthma, with metropolitan regions having a notably higher incidence. The frequency of asthma in Indian children ranged from 2.2% to 22% according to several research; however, data on the prevalence of asthma exacerbations is lacking. In 2009, 12.8 million Americans—4.0 million of whom were in the pediatric age group—had an asthma exacerbation prevalence of 4.2% in the US.[3] Asthma prevalence rose steadily between 2001 and 2009 at a rate of 1.2% year, whereas the prevalence of asthma exacerbations stayed constant between 1997 and 2009 at 3.9% to 4.3%. Children are frequently prescribed medications in an irrational manner. Drugs marketed for the pediatric age range typically have their safety and efficacy determined by adult clinical trials. Children cannot have data from adults applied to them because of differences in their pharmacokinetic and pharmacodynamic features.[4]

Children are more likely to take off-label and illegal medications as a result, which increases the risk of adverse drug reactions (ADRs) in them. This emphasizes how crucial drug utilization studies (DUS) are.[5] DUS is defined as "the marketing, distribution, prescription, and use of drugs in a society with special emphasis on the resulting medical, social, and economic consequences" by the World Health Organization (WHO).[6] We performed this study to assess drug utilisation in Paediatric patients with acute exacerbation of bronchial asthma.

MATERIALS & METHOD

After considering the utility of the study and obtaining approval from the ethical review committee, we selected fifty- six paediatric in-patients of acute exacerbation of asthma of either gender. Children diagnosed with asthma exacerbations, which are defined as bouts of progressive increase in shortness of breath, cough, wheezing, chest tightness, or some combination of these symptoms, between the ages of 1 and 15 years, regardless of gender, were included.

Data such as name, age, gender etc. was recorded. Length of hospital stay, dosage, therapeutic class, dosage form, route of administration, frequency of dosing, etc. were taken from in-patient case files. Information about blood transfusions, oxygen, vaccinations, and normal IV fluids was not documented. Using the following WHO core prescribing indicators, the prescription pattern such as average number of drugs per encounter, percentage of drugs prescribed by generic name, percentage of encounters with an antibiotic prescribed, percentage of encounters with an injection prescribed and percentage of drugs prescribed from an essential drug list (EDL) or formulary was evaluated. The results were compiled and subjected to statistical analysis using the Mann- Whitney U test. P value less than 0.05 was regarded as significant.

RESULTS

Table I Baseline characteristics

Parameters	Variables	Number	P value
Gender	Male	20	0.04
	Female	36	
Age group (years)	1-5 years	23	0.75
	6-10 years	20	
	11-15 years	13	

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Residence	Urban	40	0.02
	Rural	16	
Family history	Yes	6	0.01
	No	50	

Out of 56 patients, males were 20 and females were 36. Age group 1-5 years had 23, 6-10 years had 20, and 11-15 years had 13 patients. Residence was urban in 40 and rural in 16 cases. Positive family history was seen in 6 patients. The difference was significant (P< 0.05) (Table I).

Table II Prescribing indicators

Parameters	Variables	Number
Total number of prescriptions		56 (100%)
Total number of drugs prescribed		310
WHO core indicators	Average number of drugs per encounter	10.4
	Percentage of drugs prescribed by generic name	0
	Percentage of encounter with an antibiotic	98%
	Percentage of encounter with an injection	100%
	Percentage of drugs prescribed from essential drug list	78%
Number of anti-asthmatic drugs prescribed (excluding other concomitant drugs)	Single drug therapy	0
	Multiple drug therapy	56 (100%)
Number of anti-asthmatic drugs prescribed by injectable route		24%
Number of anti-asthmatic drugs prescribed by inhalational route		50%
Number of anti-asthmatic drugs prescribed by oral route		26%

Total number of prescriptions were 56 (100%), total number of drugs prescribed were 310. WHO core indicators was average number of drugs per encounter was 10.4, percentage of encounter with an antibiotic was 98%, percentage of encounter with an injection was 100%, percentage of drugs prescribed from essential drug list was 78%. Number of anti-asthmatic drugs prescribed (excluding other concomitant drugs) was multiple drug therapy in 56 (100%). Number of anti-asthmatic drugs prescribed by injectable route was 24%. Number of anti-asthmatic drugs prescribed by inhalational route was 50%. Number of anti-asthmatic drugs prescribed by oral route was 26% (Table II).

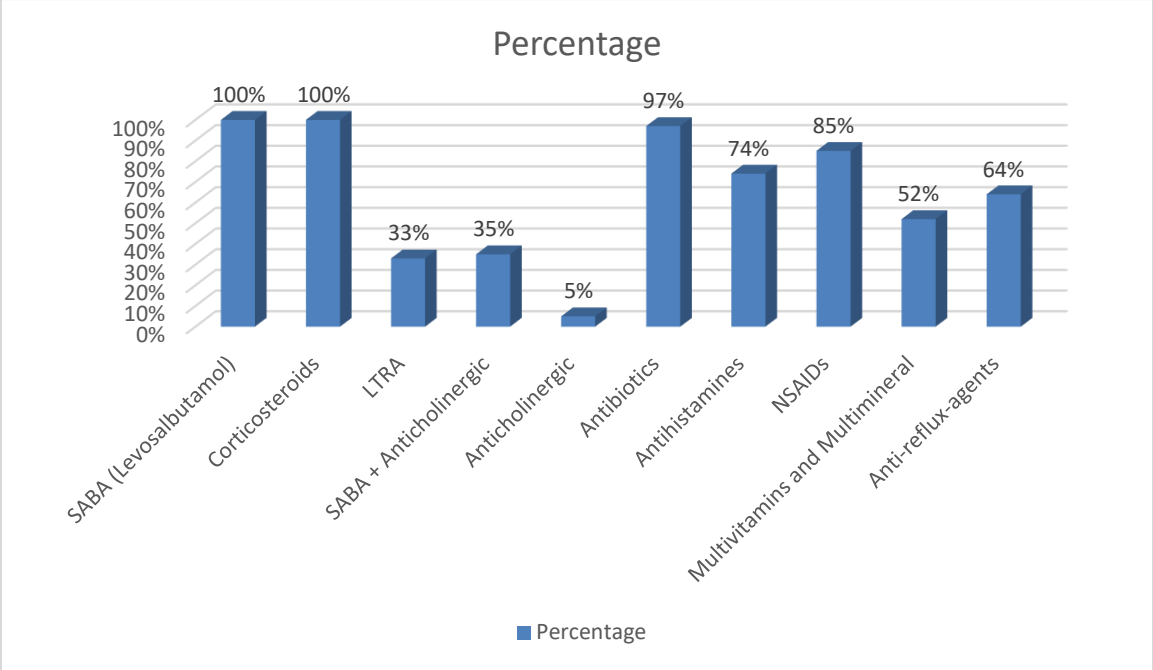
Table III Pattern of drug used

Drug	Percentage	P value
SABA	100%	0.86
Corticosteroids	100%	
LTRA	33%	
SABA + Anticholinergic	35%	
Anticholinergic	5%	
Antibiotics	97%	
Antihistamines	74%	
NSAIDs	85%	
Multivitamins and Multimineral	52%	

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 3, 2024

Anti-reflux-agents	64%	

Drugs used was SABA in 100%, corticosteroids in 100%, LTRA in 33%, SABA + Anticholinergic in 35%, anticholinergic in 5%, antibiotics in 97%, antihistamines in 74%, NSAIDs in 85%, multivitamins and multimineral in 52% and anti-reflux-agents in 64% patients (Tale III, graph I).



Graph I

DISCUSSION

"The marketing, distribution, prescription, and use of drugs in a society with special emphasis on the resulting medical, social, and economic consequences" is how the World Health Organization (WHO) defines drug use syndrome (DUS).[7,8] Drug Use Studies (DUS) facilitate the assessment and enhancement of present prescribing practices and encourage the prudent administration of medications in compliance with treatment guidelines.[9] We performed this study to assess drug utilisation in Paediatric patients with acute exacerbation of bronchial asthma.

Out of 56 patients, males were 20 and females were 36. Age group 1-5 years had 23, 6-10 years had 20, and 11-15 years had 13 patients. Residence was urban in 40 and rural in 16 cases. Positive family history was seen in 6 patients. Kaur et al[10] evaluated drug utilisation pattern for the treatment of acute asthma exacerbations in children hospitalised in a tertiary care teaching hospital. Results revealed that most commonly affected age group was 1-5 years (43.33% of total subjects) with female predominance. 13.33% children presented a positive family history of asthma. To manage acute exacerbations of asthma, all the patients received anti-asthmatic drug combinations and inhalational route was preferred. Corticosteroids and Short Acting β2 Agonists (SABA) were the most commonly prescribed drug classes. SABA (Levosalbutamol) was prescribed mainly through inhaled route (66.66%). 90% children received inhaled budesonide while IV Hydrocortisone was used in 86.66% cases of exacerbation. Combination of inhaled SABA + Ipratropium bromide was given in 36.66% patients. Montelukast was prescribed in 33.33% children as an add-on therapy. Average duration of hospital stay for the present episode was

ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 3, 2024

3.96±1.04 days. Average number of drugs per prescription was 10.13. None of the drug was prescribed by generic name and antibiotics were used in 96.66% patients.

Total number of prescriptions were 56 (100%), total number of drugs prescribed were 310. WHO core indicators was average number of drugs per encounter was 10.4, percentage of encounter with an antibiotic was 98%, percentage of encounter with an injection was 100%, percentage of drugs prescribed from essential drug list was 78%. Number of anti-asthmatic drugs prescribed (excluding other concomitant drugs) was multiple drug therapy in 56 (100%). Number of anti-asthmatic drugs prescribed by injectable route was 24%. Number of anti-asthmatic drugs prescribed by inhalational route was 50%. Number of anti-asthmatic drugs prescribed by oral route was 26%. Kaur et al[11] in their study using the prescribing metrics from the World Health Organization (WHO), the prescribing trends for Pediatric asthma were examined. Ages 5 to 9 showed a male majority of 66.74% (40.32%). 1.96 medications were prescribed on average. Inhaled corticosteroids (ICS) were the most often administered anti-asthmatic medication (77.22%). Just 1.5% of prescriptions were written using generic names, whereas 22.22% came from the list of necessary medications. The oral method (20.97%) was not preferred over the inhalational route (38.71%). The change in PEFR after a month of treatment was shown to be statistically significant.

Drugs used was SABA in 100%, corticosteroids in 100%, LTRA in 33%, SABA + Anticholinergic in 35%, anticholinergic in 5%, antibiotics in 97%, antihistamines in 74%, NSAIDs in 85%, multivitamins and multimineral in 52% and anti-reflux-agents in 64% patients. Trivedi et al[12] in their study a total 139 prescriptions were evaluated. Deriphyllin was the most commonly prescribed anti-asthmatic drug followed by beta agonist- steroid combination. Majority drugs were prescribed by inhalational route. Deriphyllin, and dexamethasone were prescribed by oral route and salbutamol was by both oral and inhalational route of administration. Antibiotics were prescribed to 24 patients. Possible drug interaction with deriphyllin was found in 15 prescriptions. Average cost per prescription was Rs. 193.4. Prescribing pattern of asthma showed more use of anti-asthmatic drugs. Standard treatment guideline should be followed. Role of methylxanthine in long term management of asthma should be justified.

CONCLUSION

The current study's observed pattern of drug usage does not entirely align with the suggested treatment guidelines for asthma. In order to guarantee the sensible use of medications in the future, concerns about brand prescription, polypharmacy, and high antibiotic prescribing rates must be addressed.

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