

ORIGINAL ARTICLE

Study of Clinical Profile & Management of Asthma In Pediatric Patients

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ABSTRACT

BACKGROUND: Word Asthma appeared for the first time in Homer's Iliad with meaning of short drawn breath. In India, rough estimates indicate a prevalence of asthma between 10-15% in 5-11 year old children. **MATERIALS AND METHODS:** This prospective study was conducted at Paediatric Department of teaching institutes in which patients more than 1 year of age admitted with the diagnosis of asthma & known case of asthma presented with acute exacerbation were included & study proforma was designed where detailed history, clinical examination were recorded with prior informed consent from patient's relative. Severity of asthma was classified by pulmonary score. Investigation & management analysed. **RESULTS:** Present study shows that bronchial asthma was responsible for 1.3% of total admissions with male to female ratio was 2.1:1. Breathlessness was present in 100% of patient followed by cough in 95.2% of patients, fever in 50.6% of patients. According to severity of acute attack, 46.5% patients had mild attack, 36.9% had moderate attack and 24% had severe attack. 23.2% patients had a positive family history of asthma. Out of 146 total indoor patients 98.6% discharged, 1.3% took discharge against medical advice. **CONCLUSION:** This study confirms that of the total patients admitted with respiratory distress, 10.5% were admission due to bronchial asthma. The rate of admission has decreased over time due to multiple reasons like increased awareness, availability of better drugs with lesser side effect

Keywords: clinical profile, asthma, paediatric patients

INTRODUCTION

Asthma is Greek word derived from the verb 'aazaim' meaning to exhale with open mouth. Word Asthma appeared for the first time in Homer's Iliad with meaning of short drawn breath but this medical term is first found in corpus Hippocraticum. Asthma is a chronic inflammatory condition of the lung airways resulting in episodic airflow obstruction. Asthma is second common cause of chronic illness associated with high morbidity¹. In India, rough estimates indicate a prevalence of asthma between 10-15% in 5-11 year children. Asthma is a serious public health problem throughout the world, affecting of all ages when uncontrolled. It can place severe limit in daily life and is sometimes fatal^{1,2}. Asthma is a chronic

inflammatory disorder of the airways in which many cells and cellular elements play an important role. The chronic inflammation is associated with airway hyper responsiveness that leads to recurrent episode of wheezing, breathlessness, chest tightness and coughing; particularly at night or in early morning.^{3,4} While most of children outgrow this disease persistence of symptoms affects the growth, behaviour and hampers the school performance. These episodes are usually associated with wide spread but variable airflow obstruction within the lung that is often reversible either spontaneously or with treatment¹. The goal of asthma therapy is maximum possible control of symptoms with minimal possible medication to decrease the severity of acute attack to minimize school absenteeism and to maintain normal growth and development². The purpose of this study is to know various clinical presentation of asthma in pediatric age group, to categorize the disease in different grades according to severity and to study the role

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of different drugs in control of acute attack and prevention of further attacks.

MATERIALS AND METHODS

This prospective study was conducted for the period of 2 years at Paediatric Department of teaching institute. The aims of this study were to look for the various clinical manifestation, precipitating/aggravating factors of asthma, the effect of inhaled bronchodilators and corticosteroids in acute attack of bronchial asthma & to study the effect of various preventive drug regimen in patients with persistent asthma. Patients more than 1 year of age admitted with the diagnosis of asthma & known case of asthma presented with acute exacerbation were included in this study with the exclusion criteria of patients of acute wheezy bronchitis due to other cause like congenital heart disease, foreign bodies, congenital anomalies of larynx, trachea, or bronchus, cystic fibrosis, gastro esophageal reflux disease. A study proforma was designed where detailed history regarding presenting complaints, aggravating factors, family history of asthma or allergy and clinical examination were recorded with prior informed consent from patient's relative. Severity of asthma was classified by pulmonary score. Investigation were carried out in the form of complete blood count, absolute eosinophil count, X Ray chest PEFR by Wright peak flow meter {Normal expected PEFR = (Height-100)x5+100}. Effects of various drugs used for treatment of acute attack studies by effect on Respiratory rate, Wheeze, PEFR. Statistical analysis was done with epi info software as & when required.

OBSERVATIONS

During the 2 years period of the study, 146 patients qualified for this study. Out of 146, 98 patients were newly diagnosed as asthma where 48 patients were known case of asthma presented with exacerbation. Bronchial asthma accounted for 10.5% of patients admitted with respiratory problems and 1.3% of total admissions. Present study shows that bronchial asthma was responsible for 1.3% of total admissions and 10.5% among respiratory disease admission. Male to female ratio

was 2.1:1, 37.6% of the patients were between 1-5 years, 44.5% of patients were between 6-10 years and 17.8% of patients were above 10 years of age. Breathlessness was most common presenting symptom, present in 100% of patients followed by cough was present in 95.2% of patients, fever was present in 50.6% of patients, nocturnal cough was present in 26.0% of patients, feeding difficulty and vomiting each was present in 3.4% of patients, altered sensorium was present in 2.7% of patients. On auscultation, audible wheeze was present in 94.5% of patients while 5.4% was having silent chest. Subcostal indrawing was present in 38.3% of patients and cyanosis was present in 1.3% of the patients. According to severity of acute attack, 46.5% patients had mild attack, 36.9% had moderate attack and 24% had severe attack. While classification wise 74.6% patients belonged to mild intermittent category, while 23.2% belonged to mild persistent category, 2.0% belonged to moderate persistent and no patient was in severe persistent category. Among mild intermittent group 29.4% patient belonged to 1-5 years, 32.8% belonged to 5-10 years, 12.3% belonged to above 10 years. Among mild persistent group 8.2% patient belonged to 1-5 year, 10.9% belonged to 5-10 years, 4.1% belonged to above 10 years. 75.3% of the patients had night time exacerbation. Seasonal variation was found as an aggravating factor in 76.7% patients, Exposure to smoke and house dust, food and physical activity were found as aggravating factor in 64.3%, 55.4% and 27.3% respectively. 23.2% patients had a positive family history of asthma. 10.2% patients had history of asthma in other family members, 7.5% had asthma in sibs and 4.7% had asthma in parents. 10.2% patients had a positive family history of other allergic disorders. Upper respiratory tract infection was associated condition in 75.3% of patients. Pneumonia was present in 10.2% and primary complex lung in 01.3% patients. 29.9% patients had significant school absenteeism.

Absolute eosinophil count was $>400/\text{mm}^2$ in 36.9% and $<400/\text{mm}^2$ in 63.1% patients. Peak expiratory flow rate could be measured in 51.3% patients and all of them (100%) showed rise in PEF after bronchodilator therapy. In patients of acute attack inhaled β_2 agonists was given to 100% patients. Inhaled β_2 agonist plus anticholinergic given in 64.3% of patients. Oral steroid was given to 26.7% patients. Intravenous steroids were given to 17.8% of patients. Subcutaneous terbutaline was given to 4.1% of patients. Mgso₄ infusion was given to only 02.7% of patients. No patient was given aminophylline. Out of 146 total indoor patients 98.6% discharged, 1.3% took discharge against medical advice. Preventive inhaled steroid therapy was given to 24.6% patients out of that 94.4% responded to inhaled corticosteroid.

DISCUSSION

During the 2 years of period, total 146 patients qualified for this study. Out of 146, 98 patients were newly diagnosed as asthma where 48 patients were known case of asthma presented with exacerbation. Bronchial asthma accounted for 10.5% of patients admitted with respiratory problems and 1.3% of total admissions. Symptoms breathlessness present in 100% of patients and cough were present in 95.2% of patients which were similar to studies by Batra⁵, Ratageri et al⁶ and Gandhi P⁷. 50.6% patients presented with fever that was comparable to Ratageri et al⁶ and Gandhi P⁷. 94.5% patients in the present study had audible wheeze which was more comparable to other studies like in Ratageri et al⁶ 88.16% and Batra et al 87%⁵. 5.4% patients presented with silent chest out of 24(16.4%) patient presented with severe exacerbation. Which were comparable to Gandhi P⁷ 6.66%. 1.3% patients presented with cyanosis and 2.7% patients presented with altered sensorium secondary to hypoxia in severe attack which was less as comparable to other studies like in Gandhi P⁷ 6.66%. These patient also belonged to <5 years of age group as they are more vulnerable to adverse effects of hypoxia at an early stage. The patients in our study were

classified according to GINA guidelines 2012³ based on the severity and frequency of asthmatic attacks. Out of total 146 patients; 109(74.6%) patients were of mild intermittent asthma while 34(23.2%) were mild persistent asthma, 43(2%) patients belonged to moderate persistent asthma. None of the patient were of severe persistent asthma. In mild intermittent category maximum numbers of patients were between 6-10 years age group, 48(44.03%). In the present study 110(75.3%) patients had night time exacerbation. In the study by schntzer et al⁸ it was found in 90% patients while Gandhi P⁷ found 73.3% and Batra et al⁵ found 60% had nocturnal symptoms. Night time exacerbation suggest that the period from midnight to 8:00AM is vulnerable period for asthmatic attack as the airway inflammation and hyper responsiveness is at the peak. The pulmonary functions are at lowest level at night time because circulating blood vessels of epinephrine and cortisol, which protect the body against asthma, are at lowest levels. Melatonin plays an important role in triggering nocturnal asthma. Melatonin is a hormone which regulates circadian rhythm. Melatonin enhances allergic airway inflammation and increases nocturnal asthma attacks⁹. Smoke due to household fuel was found to be the aggravating factor in 94(64.3%). Food like cold drinks, ice creams, bananas, chocolates, acted as aggravating factor in 81(55.4%) patients. The essence in various food colours and flavours can cause hypersensitivity reaction causing an aggravation of asthma. 40 (27.3%) children had found developed asthmatic attack following their exercise or field play at school or otherwise. 34(23.2%) had history of bronchial asthma in family. While 15 (10.2%) had family history of other allergic disorder. According to study done by Pearson et al, family history of allergic disease is positive in 18% of patient. This significant family history is in accordance to increased susceptibility of asthma in children with family history of asthma as it has been seen that the risk of having

asthma doubles with single parent having asthma. 110(75.3%) patients had associated upper respiratory tract infection, Primary complex lung was found in 02(01.3%) & pneumonia in 15(10.2%). 92 (63.1%) patients had absolute eosinophil count <400 cells while only 54(36.9%) had AEC>400 cells/mm³. Though asthma being a hypersensitivity reaction, the absolute eosinophil count was not found to be a reliable diagnostic criteria in this study. In V.C. Chaudhary et al 2003, high AEC was found in 18% of patients. While in Gandhi P⁷ high AEC was found in 42% of patients.

Out of all patients, 75 patient were able to use peak flow meter and increase in peak expiratory flow rate after bronchodilator therapy was observed in all these 75 patients. Which is comparable to Gandhi P⁷ Total 36 patients of mild persistent and moderate persistent asthma receiving inhaled corticosteroids therapy as preventive therapy, 34(94.4%) response to inhaled corticosteroids. In study done by Gandhi P⁷ after using inhaled steroids 50% of patients had decrease in inhaled β₂ agonist use and 68% of patients had decrease in oral steroids use. Out of 146 patients, 107 children were going to school.

Table 1: Clinical Presentation (Symptoms & signs)

Clinical features & Signs	No. of patients (n=146)	Percentage
Breathlessness	146	100%
Cough	139	95.2%
Fever	74	50.6%
Nocturnal cough	38	26%
Feeding difficulties	05	3.4%
Vomiting	05	3.4%
Altered sensorium	04	2.7%
Audible wheeze	138	94.5%
Subcostal indrawing	56	38.3%
Silent chest	08	5.4%
Cyanosis	02	1.3%

Table 2: Total number of patients according to classification

Age (year)	No. of patients			Percentage of total
	1-5	6-10	10-12	
Mild intermittent	43	48	18	74.6%
Mild persistent	12	16	06	23.2%
Moderate persistent	-	01	02	2.0%
Severe persistent	-	-	-	-
	37.6%	44.5%	17.8%	

Table 3: Family history

Family history	No of patients	% of total (n=146)
History of asthma in parents	16	10.9%
History of asthma in sibs	7	04.7%
History of asthma in other family member	11	07.5%
History of other allergic disorder	15	10.2%

Table 4 : Treatment given during acute attack

Drugs	No of patients	% of total
Inhaled β ₂ agonists	146	100%
Inhaled β ₂ agonist plus anticholinergic	94	64.3%
Inhaled β ₂ agonist plus anticholinergic and Steroid(oral or iv)	63	43.1%
Subcutaneous terbutaline	06	4.1%
Mgso ₄ infusion	04	2.7%
Aminophylline iv infusion	00	00%

Out of these 32(29.9%) had significant school absenteeism. Which was comparable to study done by Gandhi P⁷ 36.6% . It was due to increased rate of hospital admissions with increased incidence of intercurrent infections. Lack of enrolment in school was not due to asthma but various other factors like socio economic status etc., can contribute for the same. In study done by Sheila Bonilla 2005¹⁰, school absenteeism was found in 45% of patients.

CONCLUSION

This study confirms that of the total patients admitted with respiratory distress, 10.5 % were admission due to bronchial asthma. The rate of admission has decreased over time. This is due to multiple reasons like increased awareness, availability of better drugs with lesser side effect and easy and effective management due to better modalities of drugs administration. Preventive management can be done at home with regular drug administration, leading to better compliance. The long term effect of this being decreased hospital admission, less school absenteeism and normal life with peers. The overall use of triggers like food colours and preservative has increased with increased consumption of fast foods, packaged food etc. Therefore efforts should be made to bring more awareness to environmental and allergens to these

populations to further decrease incidence of asthma exacerbation in children already suffering from this disease.

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