

Original Research Article

Knowledge, attitude and practices among parents of asthmatic children in Rajasthan: a hospital based descriptive observational study

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ABSTRACT

Background: Asthma is chronic inflammatory disorder associated with variable airflow obstruction and bronchial hyper responsiveness with different phenotypes. The objective of this study was to study the knowledge, attitude and practices among parents of Asthmatic children.

Methods: It was a prospective observational study, conducted at Fortis Hospital Jaipur, from April 2016 to March 2018. All Asthmatic children fulfilling inclusion were included, 120 children were studied. A detailed interview of all the children/parents was conducted by pre-validated KAP questionnaire. Subjects were labelled as Bronchial Asthma in children above 5 years of age on the basis of symptoms and measurement of Peak Expiratory Flow (PEF) both baseline and post bronchodilator by PEF meter and in children less than 5 years of age by clinical symptoms, family history and response to bronchodilator according to GINA guidelines. Statistical analysis was done by one-way ANOVA test and Chi-square test.

Results: In this study 26.4% parents were ignorant about etiology, 32% believed it to be allergy and 39.62% believed it to be hereditary. 1.9% had misconception of contagious. 68% parents know that their child have asthma while 32% parents did not know. Majority (52.1%) attributed it to cold air and rainy season followed by Dust mite and pollution in (42%).

Conclusions: Knowledge about Asthma has improved over last few decades but still needs replenishment. Knowledge gap between recommended and actual practices, lack of adherence to aerosol therapy and fear of medication side-effects still persists. Parental education is important part of management of Asthma.

Keywords: Bronchial asthma, Peak expiratory flow

INTRODUCTION

Bronchial Asthma is chronic inflammatory disorder associated with variable airflow obstruction and bronchial hyper responsiveness which presents with recurrent episodes of wheeze, cough, shortness of breath and chest tightness.¹ Asthma attacks may be triggered by viral respiratory infections, environmental factors, that serve to enhance bronchial eosinophilic allergic inflammation.² The proportion of Indian school children suffering from Asthma has increased to more than double in the last 10

year.³ There is a wide variation in the prevalence of Asthma in Indian children from different age groups and different geographic areas.⁴ Education helps children and their families to develop the necessary knowledge, attitudes, beliefs and skills to manage asthma effectively. The lack of attention paid to parent's fears and concerns about their child's illness results in dissatisfaction with the consultation.⁵ Total 50% of children and adults on long-term therapy for Asthma fail to take medications as directed at least part of the time.⁶ Good communication is essential as the basis for good outcomes.⁷ Implementation

of asthma management strategies may be carried out at a national, regional or local level.⁸

METHODS

Children (0-18 years) suffering from Asthma (newly diagnosed case or follow up case) attending outpatient department of Fortis Escorts Hospital during the period from April 2016 to March 2018 were included in the study.

Inclusion criteria

- Children below 18 years of age, who were diagnosed to have Asthma according GINA 2016 guidelines.

Exclusion criteria

- Children on therapy for tuberculosis, bronchiectasis and cardiac disease and those who were not accompanied by their parents in OPD were excluded from analysis.

From previous studies, the prevalence of asthma in Jaipur, Rajasthan is found to be 7.5%.⁹ Sample size was taken as 106 as calculated using the formula:

$$N = \frac{Z(1 - \alpha/2)2 P(1 - P)}{d^2}$$

Considering dropout rate of 10% authors will be taking the sample size of 120 to maintain the power of study. 120 parents of children diagnosed with Asthma or those coming for regular checkup in the outpatient department of Pediatrics, with his/her child in the study period were enrolled in the study.

Diagnosis of asthma in children above 5 years of age was done on the basis of symptoms and measurement of airflow limitation (Peak Expiratory Flow: PEF) both baseline and post bronchodilator by using PEF meter and in children less than 5 years of age by clinical symptoms, family history of allergy and response to bronchodilator according to GINA guidelines.¹⁰

RESULTS

It was a prospective and observational single centre study. A total of 106 children with Asthma were included in this study.

Out of 106 respondents, history was provided by father in 23.6% and by mother in 18% and by both parents in 54.5%. As per Kuppuswamy’s socioeconomic status majority of parents (77%) belonged to Upper Middle (45%) and Lower middle (32%).¹¹ The ratio of rural to urban population was 1:3. 47% parents were graduate or post-graduate and 46% were working in profession or semi-profession (Table 1).

The mean age of children in studied population was 7.8 years with male preponderance (M: F 4:1). The mean duration of illness was 2.5 years. Mean age of onset of asthma was 5.3 years. Out of 106, 32% children were newly diagnosed cases and 68% were follow-up children (Table 2).

Table 1: Socio demographic characteristics of parents.

Variables		Results (%) n-106
Responding parent gender	Father	26 (23.6%)
	Mother	20 (18%)
	Both	60 (54.5%)
Socioeconomic status	Upper middle	48 (45%)
	Lower middle	34 (32%)
	Upper	16 (15%)
	Upper lower	5 (5%)
	Lower	3 (3%)
Household location	Rural	27 (26%)
	Urban	79 (74%)
Highest education level of parent	Graduate or postgraduate	50 (47%)
	Post high school diploma	20 (19%)
	Profession or honors	16 (15.5%)
	High school certificate	11 (10%)
	Primary and middle school certificate	7 (6.5%)
	Illiterate	2 (2%)
Highest occupation of parent	Profession and semi-profession	49 (46%)
	Clerical, shop-owner	35 (33%)
	Skilled worker and semi-skilled worker	15 (14%)
	Unskilled worker	6 (5.8%)
	Unemployed	1 (1%)

Out of total 106 Asthmatic children, 95 children were above 5 years of age so PEF measurement was done in them for making asthma diagnosis.

Mean baseline PEF was 140.68±48.83 which improved further to 189.95±50.68 after giving bronchodilator inhalation (p<0.0001). Since the p-value <0.05, so difference was statistically significant.

Statistically 54.7% parents reported that their children were allergic to cold items like ice-cream and cold-drinks, 25.4% children were reported to be allergic to suspended particulate matter (smoke, pollen and dust), 12.2% parents did not know if their child was allergic to some specific substance and 9.4% children were reported to be allergic to food items like citrus fruits (Table 3).

Data wise 67% parent gave history of sneezing, nasal discharge, and itching (allergic rhinitis) in their children. 19.4% parents gave past history of eczema while 23.6%

parents did not have any past history of allergy. 83(78.3%) children had family history of allergy, in parents (38.6%), in grandparents (29.2%) and in siblings (10.3%) (Table 2).

Table 2: Child's asthma condition and control.

Child gender	Results (%) n-106
Male	85 (80.2%)
Female	21 (19.8%)
M: F	4:1
Mean age of onset of asthma	5.3 years
Average gap between onset of symptoms and taking treatment	2.5 years
Mean age of children in studied population	7.8 years
History of allergy to any substance	
Cold items like ice-cream/cold drinks	58 (54.7%)
Suspended particulate matter (smoke/dust/pollen)	26 (25.4%)
Don't know	13 (12.2%)
Food items (grapes/citrus fruits)	10 (9.4%)
Past history of allergy	
Rhinitis	71 (67%)
Eczema	10 (9.4%)
None	25 (23.6%)
Family history of allergy	
Any one grandparent	20 (18.9%)
Both grandparents	11 (10.3%)
Any one parent	26 (24.5%)
Both parents	15 (14.1%)
Sibling	11 (10.3%)
None	23 (21.7%)

Out of 106 patients, 68% parents knew that their child have asthma while 32% parents were not aware about diagnosis of asthma and came to know after present study. Regarding the belief associated with asthma, 26.4% parents were ignorant about etiology of asthma. 32% parents believe it to be some kind of allergy and 39.62% attribute it to hereditary. Only 1.9% had misconception that it is contagious. 80% parents identify asthma as chronic cough, 18% parents attribute it both coughing and relief after using bronchodilator. 28% parents attributed it to wheezing and 15% attribute it to all the above symptoms (Table 3).

Regarding triggering factors, 52.1% parents attribute it to cold air and rainy season. Dust mite and pollution second most commonly perceived trigger by 42% parents. Tobacco smoke was perceived by 36% parents, 11.8% parents attribute it to exercise and emotional changes. Food items like grapes or citrus fruits were perceived by 10.6%. Only 1.9% attributes it to strong odor (sprays/perfume) (Table 3). Total 96.2% parents responded that 'yes' they would allow their children to play outdoors, 54.7% parents felt that their child could

participate in sports if asthma was under control. About 58.4% parents avoid their child from dust and cold air exposure and 64.1% parents think that regular medication can control asthma attack.

Around 50% parents felt that medications might cause drug dependence. 30% parents considered it beneficial and 13.2% parents thought that it could be harmful and causes immune weakening, 6.7% parents have no idea.

Table 3: Parent's knowledge.

		Result (%) n-106
Does your child have asthma?	Yes	72 (68%)
	No	22 (20.7%)
	Don't know	12 (11.3%)
Is asthma-s	Hereditary	42 (39.62%)
	Allergy	34 (32%)
	Contagious	2 (1.9%)
	Don't know	28 (26.4%)
Symptoms suggesting asthma in your child?	Chronic cough	85 (80%)
	Wheezing	30 (28%)
	Relief after using bronchodilator	36 (34%)
	Both 1 and 3	19 (18%)
	All 1,2 and 3	16 (15%)
Triggers/precipitating factors of asthma attack in your child?	Cold air and rainy season	55 (52.1%)
	Dust mite and pollution	44 (42%)
	Tobacco smoke	38 (36%)
	Exercise and strong emotional changes	12 (11.8%)
	Food items (grapes/citrus fruits)	11 (10.6%)
	Strong odor (sprays/perfume)	2 (2%)

Results with respect to asthma exacerbation preventive measures, out of 106 cases, about 44.34% parents would use inhaled bronchodilator via MDI (n=28, 59.5%), via Nebulizer (n=11, 23.4%) and via DPI (n=8, 17%). 23.58% would use both inhalational steroids and bronchodilator via MDI (n=15, 60%), via Nebulizer (n=7, 28%) and via DPI (n=3, 12%). While 32% would prefer oral drug formulation and report to emergency during asthma attack.

Regarding prognosis 37 (35%) parents were under the belief that it is treatable disease but decreases in severity with age, 26 (24.5%) were ignorant about its prognosis. 32 (30.1%) parents felt that it can be controlled by regular medicines, 11 (10.4%) belief that it is not curable and requires lifelong treatment.

Out of 106 parents, 32% were not on inhalational therapy and 18.86% parents discontinued due to poor supervision/follow-up, 10.3% discontinued due to

medication side-effects, 7.54% discontinued due to lack of instructions, 6.60% discontinued due to difficulty with inhaler devices. Remaining 26 (24.5%) have not discontinued. About 30.2% parents were using homeopathic medicine to treat their child's illness, 26.4% parents were using Ayurvedic medicines, 43.4% were not on any alternative mode of treatment.

DISCUSSION

Pediatric Asthma is major public health problem in developing country like India. This study describes for the first-time knowledge, practices and perception of parents of asthmatic children in Rajasthan.

In this study, 26.4% parents were ignorant about etiology of Asthma, 32% parents believed it to be some kind of allergy and 39.62% believed it to be hereditary, 1.9% had misconception that it was contagious. More rural subjects and those belonging to lower middle class of SES were ignorant about etiology. Over last 25 years (1990-2016), parent's misconception that Asthma is contagious disease has decreased due to increase awareness and health education. Their belief that asthma is hereditary still persisted and increased to 39.6% in this study due to the fact that 78.3% children had family history of allergy. These observations were similar to previous studies. Lal et al, studied 85 asthmatic children, out of which 34.1% believed that asthma is hereditary disease.¹² About 30.5% held that asthma is contagious. Shivbalan S et al, in 2005 enrolled 100 cases and found that 35% parents believed that it was hereditary and 26% held that asthma was contagious.¹³ Only 3% believed that it was due to allergy causing narrowing of airways. Family history was elicited in 45%. Bhagavatheeswaran et al, enrolled 100 parents and observed 61% felt that asthma was reversible bronchial obstruction, 16% believed that it was a communicable disease and 4% felt it a genetic/hereditary problem.¹⁴

In this study, 68% parents know that their child have asthma while 32% parents did not know about it. Majority of parents belonging to rural areas and lower middle class of SES were considering their child's illness as common cough and cold with repeated episodes. Over last 25 years, parent's acceptance of asthma diagnosis in their children has increased reflecting increased awareness. These results were similar to Shivbalan S et al, observed 39% of parents accepted diagnosis of asthma and 54% were not aware of it.¹³

Family history was observed in 45%. Ramesh et al, observed that out of 40 mothers, 13 (32.5%) had inadequate knowledge, 23 (57.5%) were found to have moderate knowledge and 4 (10%) of them had adequate knowledge regarding asthma diagnosis.¹⁵ This was because there was strong correlation of knowledge with education. Out of 40 mothers, 17 were uneducated and 23 were educated.

In this study majority of parents (52.1%) attribute it to cold air and rainy season, 42% to Dust mite and pollution, 36% to Tobacco Smoke, 11.8% to exercise and emotional change and 1.9% parents attribute strong odor (sprays/perfume). Due to increased urbanization and since majority of parents in this study has household location in urban areas of Rajasthan, so dust mite and pollution was perceived as second most common trigger after cold air and rainy season. These observations was similar to Shivbalan S et al, observed dust, cold air (60%) and tobacco smoke (61%) and rainy season (29%) were identified as triggers.¹³ Cold drinks, iced water and ice creams were perceived by 68% parents. Bhagavatheeswaran et al, observed tobacco smoke (85%), cold air (80%), While pollen (48%) and exercise (30%).¹⁴

In this study 80% parents identify asthma as chronic cough, 34% parents as relief after using bronchodilator, 28% parents as both coughing and relief after using bronchodilator, 18% identify as wheezing. Over last 12 years, parents' knowledge that chronic cough may indicate asthma has increased to 80% from 23.74% (2009), 25% (2011), 28% (2013). Statistically 34% parents were aware that relief after using bronchodilator suggests their positive attitude towards inhalational therapy. Zhao J et al, observed that only 23.74% (590/2485) recognized that a chronic cough may indicate asthma.¹⁶ Almost 63.58% of parents knew that wheezing more than three times suggests asthma. Ramesh et al, found that out of 40 mothers, 10 mothers recognized chronic cough as asthma.¹⁵ Bhagavatheeswaran et al, observed that 28% mentioned chest tightness with restricted breathing, 6% mentioned dry cough after exercise as symptoms of asthma attack.¹⁴ About 12% knew wheezing, 20% knew coughing >4 weeks, 28% knew chronic cough and 10% knew relief after using bronchodilator were symptoms.

In this study, 30.2% parents were using homeopathic medicine to treat their child's illness. 26.4% parents were using ayurvedic medicines, 43.4% were not on any alternative mode of treatment. This suggests that still parents have faith in Homeopathy or Ayurveda leading to non-acceptance of inhalational therapy. Mehrotra N et al, conducted a case report high lightening cultural belief among Asian Indian families in United States.¹⁷ He observed that Asian Indians are known to use Homeopathy and/ or Ayurvedic medications for the treatment of chronic illnesses like asthma, as they are generally believed to be less "harmful in the long-term.

In this study 68% were aware of aerosol therapy and were obtaining for use by their children suggesting increased awareness. Shivbalan S et al, found that 47% were not aware that aerosol therapy can be given at home.¹³ They felt these devices are used only during attack. Bhagavatheeswaran et al, observed that 41% respondents were aware of aerosol therapy, while 59% were unaware.¹⁴ MDI + spacer (22%) and nebulizer (13%) are

the devices used for aerosol therapy, whereas 61% did not respond.

In this study out of total 106, 42.4% children were only on inhaled bronchodilator at present while 25.4% children were on both inhaled bronchodilator and inhaled steroids. These result that inhaled corticosteroids were used by 25.4% children as was comparable to study of Bhagavatheeswaran (27%), which suggest that still the fear of steroid dependence and its harmful effects persists and parents were not able to comply with Doctor's instruction that regular controller medication helps to keep asthma under control. Shivbalan S et al, found that out of 100 children only 13 children were using aerosol therapy at home, 12 were using spacer (9 on beta-agonist and steroid and 3 on beta agonist alone) and 1 on nebulizer.¹³ Bhagavatheeswaran et al, found that 89% of the respondents said 'no' to the question about the use of medication as a preventive measure, whereas only 11% responded 'yes'.¹⁴ Inhaled corticosteroids in 27% and oral modulators in 24% were obtained for use by their children. Zhao J et al, found that 81.53% parents insisted their child for medication adherence, of which 78.33% adhered to the correct use of inhaled corticosteroids and 31.44% (637/2026) to oral Leukotriene receptor modulators.¹⁶

These studies showed that 53 (50%) parents felt that medications might cause drug dependence, 32 (30%) parents considered it beneficial and 14 (13.2%) parents thought that it could be harmful and may causes immune weakening, 7 (6.7%) parents have no idea. Similar observations have also been reported by other studies with rates ranging from 40-50%. This belief still needs awareness by education programs. Lal et al, found that 68.2% parents were not aware of the side-effects and 22.6% enumerated incorrect side-effects.¹² Shivbalan S et al, observed that parents held the view that continuous medicines impair the child's ability to outgrow the disease.¹³ The notion that these devices are addictive or harmful has lead to the non-acceptance of these modalities of therapy. Bhagavatheeswaran et al, observed that out of 13 parents using aerosol therapy, 50% felt medication causes drug dependency and is addictive.¹⁴ Ramesh et al, found out of 40 mothers, 20 were worried about addictiveness of the inhaler steroids.¹⁵ Zhao J et al, his study in China in 2009 found that 67.32% parents were worried about negative effects on children's growth, 40.56% were worried about drug dependence and 23.98% about potential harm to their child's intelligence.¹⁶

In this study out of 106 cases, about 44.34% parents would use inhaled bronchodilator via MDI (n=28), via Nebulizer (n=11) and via DPI (n=8). 23.58% would use both inhalational steroids and bronchodilator via MDI (n=15), via Nebulizer (n=7) and via DPI (n=3), 34(32%) parents would prefer oral drug formulation and report to emergency during asthma attack. These results suggest that self-administration of oral bronchodilator at home has decreased from 89.4% (1990) to 62% (2005) to 32%

(in this study) suggesting positive attitude. Lal et al, found that majority of parents 89.4% either gave bronchodilators to the child at home or consulted a doctor.¹² Shivbalan S et al, found 62% parents would self-administer oral beta-agonist medication for acute symptoms at home and proceed towards the hospital.¹³ 20% would visit hospital directly.

In present study 64.1% parents think that regular medication can control asthma attack while 50% also feared that it might cause dependency, 37.7% parents were visiting physician only in case of asthma attacks.

Statistically 35% parents were under the belief that it is treatable disease but decreases in severity with age. 24.5% were ignorant about its prognosis, 30.1% parents felt that it can be controlled by regular medicines, 10.4% belief that it is not curable and requires lifelong treatment. Parent's view that asthma is not curable disease and requires lifelong treatment has decreased over last 22 years. Shivbalan S et al, found 34% parents thought that asthma weans off with increasing age.¹³ Around 25% parents felt that disease was not curable and requires life-long treatment, 19% parents felt it a treatable disease which decreases in severity with age, 6% parents felt it is treatable and 3% said it can be controlled.

Limitations of the study was prevalence of asthma was taken as 7.5% which differ in other states of India. The effect of parental cigarette smoking and obesity on level of asthma control have not been assessed.

CONCLUSION

Parents easily accepted Asthma diagnosis if there was a family history of Asthma. Direct exposure to cold air and seasonal change were perceived as most common triggers. Most patients (67%) had past history of Allergic Rhinitis. Chronic cough was most commonly perceived as Asthma symptoms by 80% parents. Pre and post bronchodilator PEFr difference (in children above 5 years) was found to be statistically significant (p<0.0001).

Use of inhalational therapy has increased over last few years (MDI with spacer without mask in <7 years age, DPI in older children as well as nebulizer at home. Inhaled corticosteroids as controller were used only by 25.4% children, suggesting that either physician counselling was inadequate, or the fear of steroid dependence and its harmful effects prevented parents from using them.

In current study 35% parents believed that it is a treatable condition but decreases in severity as child grows older. Very few (1.9%) parents were regularly monitoring their child's condition using PEF meter, 64.1% parents thought that regular medication can control Asthma while 50% feared that it might cause dependence. In this study 58.4% parents avoided cold air and dust exposure, 37.7%

parents were visiting physician only in case of Asthma attacks whereas 21.7% parents visited once in 3 months, 56.6% were using alternative modes of treatment. Poor follow-up was common reason for discontinuation of inhalational therapy.

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