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## RESEARCH ARTICLE

# KNOWLEDGE OF ASTHMA AMONG PARENTS OF ASTHMATIC CHILDREN

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### ABSTRACT

**Introduction:** Asthma is a heterogeneous disease characterised by chronic airway inflammation. It is considered as one among the most common chronic disease in childhood in the first world countries. WHO estimates shows that some 235 million people currently suffer from asthma. In the last 10 years, the proportion of Indian school children suffering from bronchial asthma has increased to more than double and has reached its highest level ever. Parent education programmes form an integral component of asthma management. Identification of the factors, associated with the parental knowledge regarding asthma, will help to facilitate the effectiveness of educational programmes. **Objectives:** To assess the level of understanding and beliefs held by parents of asthmatic children regarding the causation, prognosis and treatment of asthma. **Methodology:** A cross sectional descriptive study, data was collected using a semi-structured questionnaire from parents of asthmatic children between 3-18 years during the study period of two years. Normally distributed continuous variables were expressed as mean (SD), non-normally distributed continuous variables as median and range. Categorical data were presented using numbers and percentages. The Chi-square or Fisher exact test was used for discrete variables. Parametric or non-parametric test of independent t-test was used to explore relationship between the variables. All analytical procedures were done by using Stata13.1 (College Station, Texas, USA) and a 5% significance level was considered. **Results:** When compared to the previous studies, parental awareness of childhood asthma has increased significantly. Those parents who were more literate were more aware of the disease. There was statistically significant association between the literacy of parents and their acceptance of the disease asthma (p-0.002). Significant number of the parents (64%) knew about genetic etiology of asthma. Among the parents who accepted that their child has asthma majority were from urban area, and this number was statistically significant (p-0.03). When the child developed acute exacerbation, more than half of the parents were able to initiate management at home. Significant percentage of parents raised concerns on the long term use of aerosol treatment. Statistically significant association was found between the educational status of parents and the increasing concerns on inhaler medications (p-0.03, p-0.04). **Conclusion:** Comprehensive parental education targeting on importance of long term treatment, remarkable safety profile of medications would help in achieving better asthma control in children.

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## INTRODUCTION

Asthma is considered as one among the most common chronic disease in childhood in the first world countries. WHO recognizes asthma as a major health problem (Peat, 1994). WHO estimates shows that some 235 million people currently suffer from asthma (WHO, 2011). In the last 10 years, the proportion of Indian school children suffering from bronchial asthma has increased to more than double. As a result of this there has been significant increase in the number of preventable hospital emergency visits and admission (Reid, 2000).

Epidemiological risk factors and the pathophysiology of the disease is well studied. Also there has been lot of improvement in the treatment of asthma. Studies have been done to identify the various factors which affect the effective control of asthma. These factors which affect the control of asthma are complex. Previous studies have identified that individual factors such as genetics, smoking inside the home, poor design of inhaler device, improper medication compliance as well as family and environmental factors such as pets in the home, air pollution and pollen exposure are important factors which determines the control of asthma (Gandhi, 2013). More attention has been focused now on the impact of parental factors on asthma outcomes.

Low health literacy levels could influence parent's understanding of asthma etiology, capability of engaging in the decision-making process with providers and compliance with the treatment plan (Amarasiri, 2014). Not only literacy, there are other parental factors which affect asthma control. Fear of side effects of long-term medications, wrong beliefs such as developing addiction to inhaled steroids and poor understanding of the natural history of the disease are some of the factors that need to be investigated. Optimal management can be achieved by educating parents to make life style changes and adhere to drug therapy for a long period even when symptoms are not present. In order to improve the knowledge of asthma among the caregivers, their baseline understanding and misperception of the illness should be disclosed. This study was an attempt to assess the knowledge of parents, regarding their child's disease asthma, its causation, treatment and prognosis.

## MATERIALS AND METHODS

This was a cross-sectional, descriptive study conducted in a tertiary care center in Southern India over a period of 2 year. Data was collected using a semi structured questionnaire by interview method from parents of asthmatic children aged between 3years and 18years, attending inpatient, outpatient services in a tertiary care centre, Bangalore. Written Informed consent from the parent was obtained. Exclusion Criteria were, parents whose children have evidence of active concomitant pulmonary diseases other than asthma and/or with evidence of chronic systemic diseases.

## RESULTS

In our study, total 101 children were distributed into three groups according to the age group, namely three year to six years, six years to 12 years, then thirteen to eighteen years. The mean age of asthmatic children in the study population is 7.1(SD- 3.4), and the mean age of onset of asthma is 3.1(SD -2.2). Among hundred and one children in our study, sixty (59.4%) were males and forty one (40.5%) were females. Parents were classified into five groups based on the level of education in our study, uneducated, Primary/Middle School, High School/Pre University, Graduate and Post Graduate. No one was in uneducated group. Seventeen (16.8%) were primary/middle school, thirty seven (36.6%) were high school /pre university, thirty two (31.6%) were graduates and fifteen (14.8%) were postgraduates.

**Table 1. Association between acceptance of the disease and literacy of parents**

Literacy	Number of parents who believes their child has asthma
Primary/Middle class	10
High school /Pre university	16
Graduates	26
Post Graduates	13

There was statistically significant association between the literacy of parents and their acceptance of the disease asthma.(p-0.002)Among those who believed their child has asthma, diagnosis was revealed by a doctor in all cases.

**Table 2. Association between literacy of parents and misperception that aerosol therapy creates addiction**

Literacy	Number of parents worrying that aerosol treatment creates addiction
Primary school/middle school	6
High school/pre university	17
Graduates	19
Post graduates	8

Among parents, those who were more literate were more worried that aerosol treatment is harmful and it causes addiction .This association between literacy and concerns regarding aerosol therapy was statistically significant with p-0.03, p-0.04.

There was statistically significant association between the literacy of parents and their acceptance of the disease asthma.(p-0.002). Among those who believed their child has asthma, diagnosis was revealed by a doctor in all cases. Majority were from urban area as consistent with other studies. Among the parents who accepted that their child has asthma majority were from urban area, and this number was statistically significant (p-0.03). Socio economic status of parents were assessed using modified B.G Prasad scale ,2015. The five classes were divided based on the basis of per capita monthly income. Only eight (7.92%) belonged to upper class, majority were from middle class. family history of asthma was present for sixty children (59.4%). In our study sixty five parents (64.3%) accepted their child has asthma and sixty five (64.3%) parents knew that the disease has hereditary predisposition, only three parents (2.29%) were of belief that it is contagious. A significant number i.e., thirty three parents (32.6%) didn't know about the etiology of the disease. There was no statistically significant association between literacy and knowledge regarding etiology of asthma A significant number of the parents (45%), when the child developed an acute episode, were using MDI with spacer, as recommended and twenty four percent parents were giving nebulisation at home immediately, fifteen percent were giving oral medicines(Beta agonist/Antibiotic/ Antihistamine/Lozenges). Majority of them knew that tobacco(91.2%),dust mite, animal dander, cockroach, indoor mould, pollen, strong odor, exercise, sports, cold air, medicines, e.t.c act as triggering factor for exacerbations. Ninety one percent of parents were aware of aerosol therapy. A significant percent of parents had lot of concerns about aerosol therapy. This adversely affects the compliance with treatment. About sixty four percent of parents were worried that aerosol therapy is harmful. Fifty four percent believed that aerosol therapy to be continued life long, fifty one percent of parents had the misperception that aerosol therapy affects the immunity, and forty one percent believed that the long term use of aerosol treatment causes addiction to it. Among parents, those who were more literate were more worried that aerosol treatment is harmful and it causes addiction .This association between literacy and concerns regarding aerosol therapy was statistically significant with p-0.03, p-0.04. Peak expiratory flow measurement helps especially during the follow up of patients, also at diagnosis, in our study only nine percent of parents were aware of peak expiratory flow rate. Forty five percent had tried other alternate system of medicine. In our study more than half of the parents (56%) accepted the fact that the disease is not a totally curable one, but needs prevention and control.

## DISCUSSION

**Age and Gender distribution:** Asthma is one among the commonest chronic illness of childhood and it accounts for more school absenteeism when compared to any other chronic disease. In the study done by Venugopal S et al, the mean age of the asthmatic children was 5.36±1.8 years (Venugopal, 2016) . The mean age of asthmatic children in our study population is 7.1(SD- 3.4), and the mean age of onset of asthma is 3.1(SD -2.2), which is consistent with the results of other studies. The prevalence of asthma is higher in boys in early life. However, the sex ratio shifts, and asthma appears predominantly in women at puberty. But in what ways sex and sex hormones, or related hormone generation, are connected to asthma has not been established (Horwood, 1985). Among hundred and one children in our study, sixty (59.4%) were males and forty one (40.5%) were females.

**Literacy of parents:** Health literacy of parents of children with asthma is an important factor that directly influences the optimal asthma care of their children. Low health literacy levels could affect parents understanding of asthma causation, ability of engaging in the decision- making process with treatment providers and also with compliance with the treatment plan. In the study done by Nasamon Wanlapakorn et al there was significant association between the education level of parents and asthma control (Prevalence of asthma). In our study, seventeen (16.8%) were primary/middle school, thirty seven (36.6%) were high school /pre university, thirty two (31.6%) were graduates and fifteen (14.8%) were post graduates.

**Rural /Urban:** In our study majority were from urban area and this is consistent with other studies (Lal, 1995). Increased incidence in urban population may be due to increased pollution and more environmental exposure to triggers.

**Socio economic status:** Socio economic status of our study population was almost similar to the other mentioned studies. In the study done by Lal et al, sixty seven percent of the families belonged to middle and lower middle SES. Among various factors which influence the control of asthma, socio economic status of parents were also analyzed. In the study done by Lal et al, Shivbalan et al there were no statistically significant correlation between socio economic status and attitude of parents. In our study also there was no association between socio economic status and knowledge regarding management of an acute episode and also parental concerns about treatment. This may be due to the fact that treatment facilities, health education activities are now available in all different strata of the community, in all settings, and now are less expensive, and also the study setting was available for all strata of people.

**Family history of asthma:** It is well proved that asthma has a genetic component to its expression, but the genetics involved in the development of asthma remain a complex and incomplete picture (Holgate, 1999). Till now, many genes have been found that are involved in or linked to the presence of asthma. In the study done by S .Shivbalan et al family history of asthma was elicited in 45 percent. In our study also, more than half (59.4%) had a positive family history which is consistent with the fact that asthma has genetic predisposition.

**Acceptance of the disease:** Asthma is a chronic disease that still has a lot of stigma in the society. Many of the parents are not recognizing asthma by its name and call it as chest allergy or recurrent respiratory infection or wheeze. In the study done by Zaraket et al only 21% parent's identified asthma by name, majority, and 64% referred to it as chest allergy, and 15% as dyspnoea. In our study sixty five parents (64.3%) accepted their child has asthma. This may be the result of better awareness programmes, proper health education and counseling about disease condition which is given at each visit in the health facilities now. Among those parents who accepted the fact that their child has asthma, majority were from urban area, and this was statistically significant ( $p < 0.03$ ). But considering the fact that study population mainly was comprised by urban population this data may be skewed. Also there was statistically significant association between the literacy of parents and acceptance of the disease ( $p < 0.002$ ). More literate parents has accepted the disease more when compared to the less literate parents, but no association with socioeconomic status of parents ( $p < 0.11$ ).

**Etiology of the Disease:** Asthma has hereditary predisposition. Parents should be aware about the etiology of the disease. In this world also many parents are of belief that asthma is contagious. Many parents, who think asthma is contagious, may not allow their children to play with other children, isolate the affected child from siblings. In the study done by Zaraket et al, most of the parents (54%) believed that asthma has hereditary predisposition, but seven percent of parents were of belief that the disease is contagious. He tried to correlate the knowledge regarding etiology of the disease with whether the parents are from rural/ urban. In the group of parents who believed the disease as contagious, those who were from rural area were more ( $p < 0.001$ ). In our study sixty five (64.3%) parents knew that the disease has hereditary predisposition, only three parents (2.29%) were of belief that it is contagious. A significant number i.e., thirty three parents (32.6%) didn't know about the etiology of the disease. This shows the need for educating the parents about the disease, giving them a clear picture of the disease. As the disease is chronic in nature, better understanding is very important. The proportion of parents who were aware of the etiology of the disease is almost the same as that of other studies. There was no statistically significant correlation between literacy of parents and also their geographical distribution with their knowledge regarding etiology of the disease.

**Management of an acute attack:** Parents should be able to identify the symptoms, know how to manage an acute episode, when to consult the doctor. In the study done by Lal et al, majority of the parents (89.4%) have given bronchodilators to the child when an acute episode occurred, and few have consulted a doctor. Only very few taken the child to the hospital the next day, without giving any treatment on the same day (11). In our study a significant number of the parents (45%), when the child developed an acute episode, were using MDI with spacer, as recommended and twenty four percent parents were giving nebulisation at home immediately. There was no correlation between the literacy of parents and the way they managed an acute episode. When compared to previous studies there is improvement in parental knowledge about management of an acute episode. Still more and more importance should be given for educating the parents, and this should repeatedly happen in each visit.

**Knowledge about various triggers:** Parental knowledge about the various triggers that precipitate their child's disease is of very important in the management of asthma. Avoidance of those triggers helps to reduce the exacerbations and thus ensures better quality of life. In the study done by S Shivbalan et al the various triggers identified by the parents were dust, cold air (60%) and tobacco smoke (61%), cool drinks, iced water and ice creams (68%) (10). In our study, majority of them knew that tobacco (91.2%), dust mite, animal dander, cockroach, indoor mould, pollen, strong odor, exercise, sports, cold air, medicines, e.t.c act as triggering factor for exacerbations. When compared to other studies our study population had good knowledge regarding the various triggers and this reflects the effectiveness of parent education, counseling and reinforcement.

**Awareness about aerosol therapy:** Aerosol therapy is the cornerstone of asthma treatment. It can be nebulisations, use of MDI, DPI. Parents should be aware when to start which medicine and also the importance of using preventer medicines to decrease the frequency of episodes. In our study ninety one percent of parents were aware of aerosol therapy. This number is reassuring as the parents were aware about the various treatment modes of asthma. Fifty seven percent were using nebulisation, MDI with spacer and mask by eleven percent, MDI with spacer alone by thirty two percent, MDI alone by three percent. More than half the children were getting nebulisations. Hence it is important to educate about the effectiveness of MDI and DPI and use of these should be encouraged more as these devices are as effective as and safer than nebulisation. And also it is important to enquire about the parents worries and concerns about use of inhalers.

**Parental concerns about the use of aerosols:** Along with avoidance of triggers, treatment of acute episode, regular follow up, monitoring the response, it is very important to be compliant with long term treatment, especially the use of preventers. Many KAP studies have brought about the parental concerns regarding the long term use of aerosol therapy. This negatively affects the compliance with treatment. In our study a significant percent of parents had lot of concerns about aerosol therapy. This adversely affects the compliance with treatment. Hence from the time of diagnosis, parents should be reassured about the safety profile of aerosol therapy. Treating doctors should always listen to parent's concerns and should educate them. Among parents, those who were more literate were more worried that aerosol treatment is harmful and it causes addiction. This was statistically significant with  $p < 0.006$  and  $p < 0.04$  respectively. Also there was statistically significant association between the geographic distribution of parents with their concern that aerosol therapy is harmful ( $P < 0.028$ ) and to be used lifelong ( $P < 0.005$ ). Urban parents were more worried. Significant worries about the use of aerosol therapy can lead to prolonged use of oral medication for symptom relief. Parents themselves use antihistamines, decongestants, oral bronchodilators e.t.c for managing asthma. In our study only three percent was on prolonged oral medication (antihistamines).

**Awareness about peak expiratory flow meter:** Peak expiratory flow measurement helps especially during the follow up of patients, also at diagnosis, in our study only nine percent of parents were aware of peak expiratory flow rate measurement and only two parents were using this.

This number is really alarming, and hence initially treating doctors should check the PEFr at diagnosis, also at follow up and to make sure parents monitor this.

**Use of alternate system of medicines:** Majority of parents tries alternate system of medicines because of various reasons, one important reason is concern about side effects of aerosol therapy. In our study forty five percent had tried other alternate system of medicine. This shows the importance of counseling the parents about chronicity of the disease, natural history of the disease, effectiveness and safety profile of the treatment options, so that parents trust in the treatment and may not seek other medications which are not evidence proved and also safety profile being not known. There was no statistically significant association between literacy of parents ( $p=0.7$ ) and also geographic distribution of parents ( $p=0.52$ ) with the use of alternate system of medicines.

**Knowledge about prognosis of the disease:** More than curable, asthma is a disease of chronic duration which is preventable and controllable. Variability of the disease is well established. Acceptance of this by the parents has a lot of importance in the treatment course. In the study by Lal et al, sixty percent believed that asthma can be cured. In our study more than half of the parents (56%) accepted the fact that the disease is not a totally curable one, but needs prevention and control. Hence when compared to the above mentioned studies our population had a better understanding about the natural history of asthma.

## CONCLUSION

When compared to the previous studies, parental awareness of childhood asthma has increased significantly. Those parents who were more literate were more aware of the disease, when compared to less literate parents. Significant percentage of parents raised concerns on the long term use of aerosol treatment. Statistically significant association was found between the educational status of parents and the increasing concerns on inhaler medications. Because of the misperception that long term use of preventer medication has adverse effects, parents may not adhere with the long term treatment and it significantly affects the proper control of disease, and results frequent exacerbations, reduction in quality of life, dependence to alternate system of medicines (45.5%). Hence proper parental education targeting on importance of long term treatment, remarkable safety profile of medications would help in achieving better asthma control in children.

### Key points:

- Childhood asthma, a major health problem
- Parental concern on long term aerosol treatment will affect adherence to treatment
- Comprehensive parental education for better asthma control.

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## GLOSSARY OF ABBREVIATIONS

**DPI:** Dry Powder Inhalation

**MDI:** Metered Dose Inhaler

**PEFR:** Peak Expiratory Flow Rate

**WHO:** World Health Organization

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