Original Article

Assessment of Asthma Knowledge of Parents of Children with Bronchial Asthma

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Abstract

Introduction: Understanding bronchial asthma plays a crucial role in the management and control of this chronic disease. While good asthma knowledge of the parents helps in better control of the disease in their children, it remains variable among the parents. **Materials and Methods:** This cross-sectional observational study was conducted in the outpatient asthma clinic of a tertiary center. New Castle Asthma Knowledge Questionnaire (NAKQ) were filled out by the caregivers of children (between 7 and 15 years, diagnosed as per global initiative for asthma guidelines) with bronchial asthma, after obtaining the proper consent. The validated Hindi version of the NAKQ questionnaire had a total of 31 questions regarding knowledge, acute asthma attacks, maintenance management, and misconceptions. **Results:** Eighty-five parents responded to the NAKQ questionnaire during this 1-year duration. 58 (68.24%) were fathers, and 27 (31.76%) were mothers, filling out the questionnaires. The knowledge score of the respondents enrolled in the study ranged from 10 to 18, the median knowledge score was 14, and the mean knowledge score of respondents was 14.02 ± 1.93. **Conclusion:** The mean knowledge score of the parents of bronchial asthma patients was found to be low in our setting as compared to other studies where a similar questionnaire was used.

Keywords: Asthma knowledge, India, New Castle Asthma Knowledge Questionnaire, parental knowledge, pediatric asthma

Introduction

Asthma is a common chronic illness of childhood in developing as well as developed countries affecting not only the person suffering and the concerned family but also the society on social and financial levels.[1-3] Current recommendations for asthma management emphasize asthma education to improve symptoms and quality of life.[4,5] Nevertheless, despite active efforts in asthma awareness in recent years, the knowledge of this illness remains low.[6,7]

The study was conducted to assess the knowledge and attitude of the parents of children with asthma being treated in our asthma clinic with the help of a Hindi version of a validated questionnaire.

Materials and Methods

Study design

This cross-sectional observational study was conducted from June 2017 to May 2018.

Study setting

The study was conducted in the pediatrics outdoor asthma clinic of a tertiary care center in Northern India.

Inclusion criteria for the study population were all those parents of children with bronchial asthma (diagnosed as per global initiative for asthma guidelines) aged between 7 and 15 years who visited the asthma clinic over the study period.[8] Out of these who were able to read and understand Hindi and gave consent for the study were included, whereas those not fulfilling the criteria mentioned above were excluded.

Sample size

The final sample included 85 parents who agreed to participate in the study out of a total of 100 parents who were found eligible.

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Study tools and data collection

Knowledge scoring was done by administering the Hindi version of the New Castle Asthma Knowledge Questionnaire (NAKQ), developed by Fitzclarence and Henry to one of the willing parents of these patients in a separate room, whereas unclear items of the questionnaire were explained if the need arose.[9] This questionnaire contains 31 questions and is intended to assess caregivers' understanding of asthma, triggers, myths, and treatment knowledge. All the questions except Q1, Q6, Q10, Q11, Q21, and Q23 (of the English Version) had true/false answers, and for these direct response questions, every wrong answer or option do not know was granted a 0 score, whereas every correct answer was granted 1 score. The six open-ended questions were evaluated based on scoring rules according to the question. In the case of the first question, if all three main symptoms of asthma were included in the answer, it was marked correct and granted 1 score. The answer to question six was marked correct if at least one of the three triggers that are known as possible answers was mentioned. Questions 24, 25, 26, and 28 were marked as correct if the respondent gave at least two of the answers that were offered as possible answers in the original questionnaire.[6,7] The questionnaire was first tested in a pilot study in 10 patients before being used in this study. Sociodemographic variables and educational status of the parents were also documented.

Statistical analysis

A descriptive analysis was performed for the variables in the data we collected. Mean, standard deviation, and median were calculated for quantitative variables. Frequencies and percentages were used to describe qualitative variables. Data were entered into the Microsoft Excel Sheet under predefined variables. For analysis, SPSS software (Company IBM, New York, US) (Windows version 21) was used.

Ethical consideration

Ethical approval for the study was taken from the Institute's Ethics Committee, King George's Medical University (reference code 82nd ECM II-B Thesis/P41). Written informed consent was obtained from each participant while assuring them of the confidentiality of their information. This study complied with the guidelines provided by the Declaration of Helsinki, updated in 2013.

Results

Out of the 85 parents, 58 (68.24%) were fathers, and 27 (31.76%) were mothers, filling out the questionnaires. The patients were 55 males (64.70%) and 30 females (35.29%) [Table 1].

The knowledge score of the respondents enrolled in the study ranged from 10 to 18, the median knowledge score was 14, and the mean knowledge score of respondents was 14.02 ± 1.93 [Table 2].

The percentage of correct answers is given in Table 3. These responses were analyzed in detail and the following inferences were drawn.

Table 1: The general characteristics of the study population

	(*n*=85), *n* (%)
Survey respondent	
Father	58 (68.24)
Mother	27 (31.76)
Education level	
Primary school	3 (3.53)
Up to high school	32 (37.65)
Beyond high school	50 (58.82)
Sex of the patient	
Male	55 (64.70)
Female	30 (35.29 h)

Table 2: Knowledge score among the study population

Number of respondents	Minimum	Maximum	Median	Mean	SD
85	10	18	14	14.02	1.93

SD: Standard deviation

Common knowledge regarding asthma

Questions 1, 2, 3, 9, 17, 18, 19, and 31 were regarding the knowledge of asthma. Only 21.2% knew the main symptoms of asthma, as per the scoring method, the one stating 3 answers was considered correct. About 30.6% knew the prevalence of asthma, and 92.9% were able to tell that asthma patients have abnormally sensitive airways. 67.1% knew that patients can do exercises other than swimming and only 36.5% knew that asthma does not damage the heart.

Many of them (69.4%) knew that asthma can get worse if the child is around someone smoking. Unexpectedly very few of them (3.5%) could say that asthma usually causes more problems at night. 32.9% knew that the best way to assess the severity of asthma was not doctor listening to the chest of the child.

Acute attack: Identification, causes, and treatment

Questions 6, 7, 8, 15, 23, 25, 26, 27, 28, 29, and 30 were regarding acute attack. 77.6% were able to tell at least three triggers causing the acute attack. 91.8% and 42.4% knew that during asthma attacks wheezing may be due to contractions of muscles of pulmonary walls and swelling of pulmonary airways, respectively.

When it comes to management, surprisingly 82.4% thought asthma medications can be harmful to the heart. 78.8% answered correct drugs that could be used for acute attacks and only 9.4% knew how to prevent exercise-induced asthma attacks.

The response rate was very poor (1.1%) regarding question no. 23, similarly, most of them could not tell the causes of no response 5 min after taking an inhaler (62.4%). It needs to be highlighted that 81.2% knew it is not okay to treat the patient at home if there is no improvement after 2 h of self-medication.

Table 3: Questions with their responses, percentages, and correct answers as per the Hindi version of the Newcastle Asthma Knowledge Questionnaire

Items	*n* (%)	Correct answers
1. What are the three main symptoms of asthma?	18/85 (21.2)	Cough, wheezing, shortness of breath
2. One in ten children will have asthma at some point during their childhood	26/85 (30.6)	True
3. Children with asthma have abnormally sensitive pulmonary airways	79/85 (92.9)	True
4. If one child in the family has asthma, then all of his brothers and sisters are likely to have asthma as well	60/85 (70.6)	False
5. Most children with asthma have an increase in mucus when they drink cow milk	56/85 (66.3)	False
6. Write down everything that you know may trigger an asthma attack	66/85 (77.6)	Allergens, cold, exercise
7. During an asthma attack, the wheezing may be due to the contraction of muscles that form the walls of the pulmonary airways	78/85 (91.8)	True
8. During an asthma attack, the wheezing may be due to the swelling of the lining of the pulmonary airways	36/85 (42.4)	True
9. Asthma damages the heart	31/85 (36.5)	False
10. Antibiotics are an important part of treatment for most children with asthma	28/85 (32.9)	False
11. Children with asthma should not consume dairy products	70/85 (82.36)	False
12. Allergy shots cure asthma	51/85 (60)	False
13. Asthma patients usually have “nervous problems”	38/85 (44.7)	False
14. Asthma is an infectious disease	68/85 (80)	False
15. Some treatments for asthma damage the heart	70/85 (82.4)	False
16. Asthma medications are addictive	20/85 (23.5)	False
17. Swimming is the only suitable sport for asthmatics	57/85 (67.1)	False
18. Parental smoking may make the child’s asthma worse	59/85 (69.4)	True
19. Asthma is usually more of a problem at night than during the day	3/85 (3.5)	True
20. Most children with asthma will have stunted growth	24/85 (28.2)	False
21. Children with frequent asthma symptoms should take preventive drugs	5/85 (5.8)	True
22. With appropriate treatment, most children with asthma should be able to lead a normal life with no restrictions on activity	62/85 (72.9)	True
23. If a person dies of an asthma attack that usually means that the last attack must have developed so fast that there was no time to start a treatment	1/85 (1.1)	False
24. Write down two drugs for asthma that are commonly used on a daily basis	18/85 (21.2)	Two of inhaled corticosteroids, chromones, montelukast, long-acting b2 adrenergic agonists
25. Which asthma drugs are useful during an asthma attack?	67/85 (78.8)	Two out of: Short-acting b-2 adrenergic preparation, ipratropium bromide, oral corticosteroids, and oxygen
26. A 5-year old child has an asthma attack and takes two puffs from MDI. After 5 min there is no improvement. Give some reason why this may have happened	53/85 (62.4)	Two from The medication has expired, inhaler is empty, poor technique, insufficient dosage
27. During an asthma attack that is being treated at home, your child needs to use an inhaler with a space chamber (or mask) every 2 hours. He is getting better but after 2 hours he is having difficulty breathing. Since the child is not getting worse, it is OK to continue giving the treatment every two hours	69/85 (81.2)	False
28. Write ways in which one can help prevent an asthma attack during exercise	8/85 (9.4)	Two out of: Warm up exercise, short-acting b-2 agonists or chromones before exercising, managing asthma more carefully, breathing through the nose, warm and humid environment
29. Inhaled medications for asthma have fewer side effects than tablets and syrups	81/85 (95.3)	True
30. Short course of oral steroids usually have significant side effects	18/85 (21.2)	False
31. The best way to measure the severity of a child’s asthma is for the doctor to listen to the child’s chest	28/85 (32.9)	False

MDI: Meter dose inhaler

Maintenance management

Questions no. 10, 12, 21, 22, and 24 were related to this section. Only 21.2% were able to write two maintenance medications used for asthma, 32.9% knew that antibiotics were not part of the treatment, and 60% knew that allergy shots did not cure asthma. Surprisingly, only 5.8% thought children with frequent

asthma should take preventive medications. 72.9% believed that with appropriate treatment, children with asthma can lead a normal life.

Questions regarding misconceptions

Questions no. 4, 5, 11, 13, 14, 16, and 20 were included in this section. 70.6% believed that if one child had asthma, rest all of his/her siblings would not have asthma at some point in time and 66.3% believed that cow milk intake does not cause an increase in mucus. Despite that 17.64% preferred to avoid giving dairy products to the child. Only 44.7% knew that these asthmatic children do not have a nervous personality. 80% knew that asthma is not an infectious disease and a majority of them (76.5%) believed that asthma medications can lead to addiction.

Discussion

Health education is the most crucial part of asthma management in children. Exacerbations can be easily avoided in children with parents having a broader knowledge about the disease, ideas about the identification of symptoms and triggering factors, and the necessary measures needed to treat exacerbations as parents are the connecting link between the physician and the asthmatic children.[10,11]

Our study used the Hindi version of the NAKQ questionnaire, an extensively validated and reliable tool to assess asthma knowledge. Nevertheless, the parents assessed in this study exhibited less than satisfactory knowledge about asthma. The average knowledge score of parents was 14.02. Cabello *et al*. conducted a NAKQ questionnaire-based study in Spain. Their average score was 18.5 which is higher than the mean knowledge score of our study.[1] Gibson PG *et al*.[12] conducted a study on teachers and reported a mean knowledge score of 14.90, comparable to our study.[11] In 1990, Fitzclarence and Henry did a study to validate the questionnaire where they divided the respondents into "high knowledge" and "low knowledge" on the basis of mean scores of 25.3 and 13 points, respectively.[9] In our study, the mean knowledge score was rather lower than the other similar studies.[13]

Our results are comparable to other studies mentioned earlier, but they are somehow insufficient for achieving a satisfactory level of disease understanding in our patients.[9,14,15] It shows that even those who had children with asthma symptoms for a while and children who were being followed up in a specialty clinic, do not have a full understanding of the disease entirely from a caretaker's perspective, indicating the paucity of knowledge and visits to the emergency room visits. According to our study, for question 24, only 21% of the parents could tell the two drugs used daily for asthma prevention, which was markedly lower than those reported by Cabello *et al*. but somehow better than the Korta study.[1,16] This reflects the lack of critical knowledge about asthma expected of these parents. Contrary to the above in our study, 78.8% knew the drugs to be given during an acute attack of asthma, these results were markedly higher than those of the Korta study (11%) and Praena study (7.9%).[16,17] This could be due to the parents in our study relying more on medication needed to improve asthma symptoms rather than using daily asthma preventive medications and their suboptimal compliance with preventive medications. A recent study from Silvia *et al*. has also emphasized the association of good asthma knowledge with better inhaler adherence.[18]

Our study results showed a greater majority believe that asthma medications are addictive and can damage the heart. These socially prevalent myths about health issues hamper the understanding and acceptance of medical care contributing to inadequate asthma control in children.[19,20] Educational interventions have been shown to burst these myths and better asthma control.[21]

There were a few limitations to our study such as we did not correlate the parent's knowledge with the child's disease characteristics such as duration and severity. This would have further explored the effect of parental asthma knowledge on the management of the disease. An educational session could have also been conducted to see the effect of educational intervention on the asthma knowledge of the parents. Still, it was not possible due to the cross-sectional nature of the study.

Strong and weak points of the questionnaire

Validated questionnaires allow high comparability among various studies and many questionnaires have been developed to assess asthma knowledge.[22] The NAKQ is a valid instrument to assess parents' and caregivers' asthma knowledge.[9,18] The NAKQ questionnaire was easily accessible on the web and was free of cost. There were some difficulties in interpreting some questions such as 23 and 27, and they did not truly reflect the knowledge of the respondent. Cultural and social effects should also be taken into consideration concerning a few correct answers. Few open-ended questions (25, 26, 28) were also there which further led to difficulty in understanding the questions as compared to dichotomous ones.

Conclusion

We concluded that our study showed respondents having a lower level of asthma knowledge evident from their low mean knowledge scores compared to other studies. Further studies to assess parental asthma levels should be conducted at the community level as in assessment at the tertiary level, the parents have likely received information at primary and secondary levels. More educational programs and interventions should be incorporated along with the pharmacological management of asthma in the pediatric population to reduce morbidity and hospitalization, improve quality of life, and better asthma control.

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Conflicts of interest
There are no conflicts of interest.

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