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THE CLINICAL PROFILE OF PATIENTS DIAGNOSED WITH ASTHMA: A RETROSPECTIVE STUDY AT PULMONARY CLINIC IN QUEEN RANIA HOSPITAL FOR CHILDREN (QRCH)

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ABSTRACT

Introduction: Asthma is the most common chronic disorder of childhood and it is a complex condition characterized by the presence of chronic inflammation in the lower airways giving rise to various respiratory symptoms. The clinical profile of each patient with asthma differs in terms of age at presentation, gender, clinical symptoms, and risk factors like atopy. **Aim:** To study the clinical profile of patients with bronchial asthma and the risk factors for pediatric asthma in Queen Rania hospital for children. **Material and Methods:** The study was conducted on 100 pediatric patients of both sexes, diagnosed with bronchial asthma and were started on controller therapy. The clinical assessment was performed in the pediatric pulmonology clinic retrospectively over one year using a standardized questionnaire. Ethical approval was obtained prior to the study. **Results:** A total of 100 patients diagnosed with bronchial asthma were included in this study, the age of the patients ranged from 6 to 14 years, and the median age of the study population was 9 years, the majority of patients were males (58%). Of our 100 patients, 42 (42%) patients gave history of allergic rhinitis, 12 (12%) patients gave history of food allergy, and 46 (46%) had no atopy. Spirometry was done for all of our patients, 8 (8%) of them had FEV1 measurment below 85%, 4 (50%) of them had allergic rhinitis, 2 (25%) of them had food allergy, and 2 (25%) of them had both food allergy and allergic rhintis. Patients who gave history of asthma before the age of 6 years were 60 (60%), 30 (50%) of them had history of allergic rhinitis, 10 (16.7%) of them had history of food allergy, 9 (15%) of them had history of both food allergy and allergic rhinitis, 11 (18.3%) of the patients were not known to have allergic rhinitis or food allergy. Out of our 100 patients, severe asthma was diagnosed in 16 (16%) patients, of those 16 patients 4 (25%) patients had allergic rhinitis, 2 (12.5%) patients had food allergy, and 10 (62.5%) patients had both allergic rhinitis and food allergy, Frequency of exacerbations was found to be highest among patients that have allergic rhinitis and food allergy with a median of 8 exacerbations/year. **Conclusion:** The study found a correlation between the presence of atopy in pediatric asthma patients and the severity of symptoms, persistence of asthma symptoms, and low spirometry measures of FEV1.

KEYWORDS: Asthma-pediatric asthma, Allergic rhinitis, Food allergy, Forced expiratory volume FEV1, Radioallergosorben test (RAST).

INTRODUCTION

Asthma is the most common chronic disorder of childhood with an increasing prevalence worldwide and is a significant cause for morbidity and hospital admissions. The pathogenesis of asthma is multifactorial; it is a combination of chronic inflammation of the lower airways along with interactions between infections, atopy, genetic predisposition, and environmental triggers (e.g. smoking exposure, air pollution). This complex combination of all these factors makes asthma a heterogeneous disorder and more studies are focusing on classifying patients based on the airway endotype in order to make the management more precise and individualized.

Many factors are associated with the development of pediatric asthma, such as prematurity, family history of asthma, smoking exposure, exposure to pets, or dust mites, personal history of allergic rhinitis, atopic dermatitis, and food allergy.[1,2]

Food allergy sensitization is one of the important treatable risk factors for asthma exacerbations.[3,4] Severe asthma exacerbation can be resulted from food-induced anaphylaxis.[5] Relying on patient-reported history of

food allergy alone is unreliable to diagnose food allergy; using skin prick tests or radioallergosorben test (RAST) is more reliable.[6,7]

Allergic rhinitis is a frequent finding in pediatric asthma.[8,9] Atopy is the main risk factor for both asthma and allergic rhinitis and is strongly correlated to the severity and chronicity of asthma symptoms.[10,11]

MATERIALS AND METHODS

A retrospective study design was used to carry out this study after having the ethical approval from our institute's ethical committee. The data was collected from 100 pediatric patients of both genders in the pediatric pulmonology clinic at Queen Rania Hospital for Children over one year from June 2021-June 2022. Patients were diagnosed with bronchial asthma based on GINA guidelines for pediatric asthma. A standardized questionnaire was carried out including age of diagnosis, family history of asthma, frequency of exacerbations, personal history of allergic rhinitis, and food allergy. Spirometry was done to all the patients, RAST test was done for patients who gave history of food allergy or aero-allergies.

RESULTS

A total of 100 pediatric patients diagnosed with asthma aged 6-14 years were included in this study. The median age of the study population was 9 years, and the majority of patients were males (58%).

Of our 100 patients, 42 (42%) patients gave history of allergic rhinitis, all of them underwent RAST testing and the results showed that 22 (52.4%) patients had allergy to pollens, and 20 (47.6%) patients had allergy to mites.

Of our 100 patients, 12 (12%) patients gave history of food allergy, and all of them underwent RAST testing and the results showed that 5 (41.6%) patients had allergy to eggs, 3 (25%) had allergy to milk, 2 (16.7%) had allergy to peanuts, and 2 (16.7%) had multifood allergies including egss and peanuts.

Spirometry was done for all of our patients, 8 (8%) of them had FEV1 measurment below 85%, of those 8 patients 4 (50%) of them had allergic rhinitis, 2 (25%) had food allergy, and 2 (25%) had both food allergy and allergic rhintis.

Patients who gave history of asthma before the age of 6 years were 60 (60%), 30 (50%) of them had history of allergic rhinitis, 10 (16.7%) of them had history of food allergy, 9 (15%) of them had history of both food allergy and allergic rhinitis, 11 (18%) of the patients were not known to have allergic rhinitis or food allergy.

Out of our 100 patients, severe asthma was diagnosed in 16 (16%) patients, of those 16 patients, 4 (25%) patients had allergic rhinitis, 2 (12.5%) patients had food allergy, and 10 (62.5%) patients had both allergic rhinitis and food allergy,

Frequency of exacerbations was found to be highest among patients that have allergic rhinitis and food allergy with median 8 exacerbations/year.

Measure	Total	With Allergic rhinitis	With Food allergy	With both allergic rhinitis and food allergy	Without allergies
Severe asthma	16 (16%)	4 (25%)	2 (12.5%)	10 (62.5%)	0 (0%)
Asthma started before the age of 6.	60(60%)	30 (50%)	10 (16.7%)	9 (15%)	11 (18.3%)
FEV1 <85%	8 (8%)	4 (50%)	2 (25%)	2 (25%)	0 (0%)

Table: the different profiles of asthma patients and their relation to severity of asthma, persistence of symptoms from preschool years and low FEV1 values.

DISCUSSION

Asthma is the most common chronic disease of pediatrics.[12,13] Studies have been conducted to correlate the different risk factors influencing the prevlance of asthma in children, the severity of symptoms, and the risk of having persistent symptoms.

Atopy is a well-known risk factor for the development of pediatric asthma.[14] In our study allergic rhinitis was found in a significant number of patients as was found in many studies worldwide,[15] and it was strongly related to severe asthma symptoms, persistence of symptoms from preschool years into childhood,[16] and a lower FEV1 measurments.[16,17] The main aeroallergeons that were found in our patients diagnosed with chronic allergic rhinitis using RAST testing were pollens in 22 (52.4%) patients, and dust mites in 20 (47.6%) patients.

Pollen exposure is considered an important risk factor for asthma symptoms and emergency department visits. There is a strong correrelation between pollen concentartion (which differes according to the time of the year, and the geographical distribution) and the severity of asthma symptoms.[18] Taking into consideration this fact in this selected category of patients who have pollen allergy would help to step up their asthma medications which could help them to avoid severe asthma symptoms during the periods of high pollen concentarion.[19,20,21]

Dust mite allergen exposure is an important risk factor for pediatric asthma. House dust mites are a major source of indoor aeroalleren allover the world resulting into different types of allergies; such as allergic asthma, rhinoconjuctivities, and atopic dermatitis.[22] Measures to avoid home dust mites showed a significant improvement of asthma symptoms in terms of number of exacerbations and emergency department visits.[23]

Food allergy is a common risk factor for pediatric asthma and plays an important role in the severity and persistence of symptoms.[24] In our study group, food allergy was found in 12 (12%) patients , and it was more associated with severe cases of asthma, persistent symptoms and a lower FEV1 measurments.[24,25,26]

Asthma management in patients who have food allergy should be more aggresive as it was found in recent studies that those patients have a higher fractional exhaled nitric oxide (FeNO) and sputum esinophils in comparison to asthmatic patients without known food allergy.[27,28] Moreover studies showed that asthmatic patients that have both food allergy and aeroallergy to pollens have a higher esinophilic inflammation in the airways and need more close monitoring and treatment.[27,28,29]

The forced expiratory volume in the first second FEV1 is an important tool to follow up the management of asthma patients. In our study there was a correlation between low FEV1 values and the presence of atopy in asthmatic children. Sparse studies were found about this correlation specifically, but more studies showed a strong correlation between FeNO measurments (which is a marker for inflammation and is used as a diagnostic and follow up tool for asthma and is found to be higher in patients with known food allergy.[27,28] and spirometry values especially FEV1, and FEV1/FVC.[30,31,32]

CONCLUSION

As a conclusion, we found a strong correlation between atopy which was seen in the form of aeroallergy, and/or food allergy and pediatric asthma in terms of severity, frequent of exacerbations, persistence of symptoms, and lower FEV1 values.

Understanding this relationship would help in the indivisualised management of asthma in the context of the peculiar airway endotype of asthmatic patients with atopy.

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