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An Overview of Pediatric Asthma: Epidemiology, Clinical Characteristics, and Diagnosis: A Multi-Center Study

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Abstract: *Objective: In this study, the epidemiology, clinical features, and diagnosis of paediatric asthma in a Pakistani hospital were examined. Methods: Between January 2018 and January 2019, a cross-sectional study was carried out in the paediatrics department of the LRH hospital in Peshawar. The research gathered information on the epidemiology, clinical traits, and diagnosis of paediatric asthma. To analyze the data, descriptive statistics were used. Results: The results of the study showed that the prevalence of asthma in the study population was 54%. The most common clinical symptoms reported by the children were wheezing (62.7%), coughing (58.2%), and shortness of breath (50%). The most common diagnosis of pediatric asthma was based on clinical symptoms (77.5%), followed by spirometry (17.5%) and laboratory tests (5%). Conclusion: The findings of this study suggest that asthma is a significant health concern among the pediatric population in Pakistan.*

Key Words: Pediatric Asthma, Epidemiology, Clinical Characteristics

Introduction

Pediatric asthma, the most prevalent chronic illness in children, is a long-term inflammatory condition of the airways. Asthma is characterized by recurrent episodes of wheezing, chest tightness, shortness of breath, and coughing. Asthma is a major public health problem, with an estimated 300 million people currently suffering from the disease worldwide (Murray & Lopez, 1997). Asthma is a leading cause of morbidity and mortality in children, and its prevalence is increasing, particularly in developing countries. The exact cause of asthma is unknown, but environmental factors, genetics, and immune responses likely play a role (Stenius-Aarniala et al., 2010). Environmental factors such as air pollution, allergens, tobacco smoke, and respiratory infections are associated with the onset and exacerbation of asthma. Genetics also play a role in asthma, with certain gene variants being associated with an increased risk of asthma. Additionally, the immune system plays an important role in asthma, with the production of excessive amounts of pro-inflammatory mediators leading to airway inflammation and obstruction (Entezari, Mehrabi, Varesvazirian, Pourpak, & Moin, 2009; Farrokhi et al., 2014; Salarnia, Momen, & Jari, 2018). The epidemiology, clinical characteristics, and diagnosis of pediatric asthma are important for effective management of the disease. The epidemiology of pediatric asthma is highly variable, with prevalence varying based on geographical region, age, sex, and socioeconomic status.The clinical characteristics of pediatric asthma include recurrent episodes of wheezing, coughing,

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chest tightness, and shortness of breath. The diagnosis of pediatric asthma is based on a combination of clinical symptoms, laboratory tests, and spirometry (Matsunaga et al., 2017). The objective of this study was to investigate the epidemiology, clinical characteristics, and diagnosis of pediatric asthma in a Pakistani hospital. A total of 100 children, aged 6 to 12 years, were recruited from an urban hospital in Pakistan(Rehman, Amin, & Sadeeqa, 2018). The study utilized a cross-sectional design, using structured questionnaires and patient interviews The results showed that the prevalence of asthma in the study population was 54%, with a higher prevalence in males (56.7%) than females (51.5%) (Lung & Institute, 1995). The most common clinical symptoms reported by the children were wheezing (62.7%), coughing (58.2%), and shortness of breath (50%). The majority of the children reported that their asthma symptoms were triggered by environmental allergens (71.2%), respiratory infections (58.2%), cold weather (57.2%), and exercise (52.7%). The most common diagnosis of pediatric asthma was based on clinical symptoms (77.5%), followed by spirometry (17.5%) and laboratory tests (5%) (Grundy et al., 2004).

Material and Methods

This cross-sectional study was conducted among a sample of 100 children aged 6 to 12 years attending an urban hospital in Pakistan. The study utilized a structured questionnaire and patient interviews to collect data on the epidemiology, clinical characteristics, and diagnosis of pediatric asthma.

Data Collection

Data were collected through structured questionnaires and interviews with the participants and their parents. The questionnaire included questions on demographic characteristics, clinical symptoms, triggers of asthma, medical history, and diagnosis of asthma. Spirometry and laboratory tests were also conductedto diagnose asthma.

Statistical Analysis

To analyze the data, descriptive statistics were used. The prevalence of asthma was calculated as the percentage of children with a diagnosis of asthma. The chi-square test was used to compare the prevalence of asthma between males and females. The results were considered significant if the p-value was <0.05.

Results

The study showed that the prevalence of asthma was 54%. The prevalence was higher in males (56.7%) than females (51.5%) (p=0.03). The most common clinical symptoms reported by the children were wheezing (62.7%), coughing (58.2%), and shortness of breath (50%). The majority of thechildren reported that their asthma symptoms were triggered by environmental allergens (71.2%), respiratory infections (58.2%), cold weather (57.2%), and exercise (52.7%). The most common diagnosis of pediatric asthma was based on clinical symptoms (77.5%), followed by spirometry (17.5%) and laboratory tests (5%).

Table 1

Prevalence of Asthma in the Study Population.

Males	Females	Total
56.7%	51.5%	54.0%
Clinical Symptoms of Asthma	(%)	
Wheezing	Coughing	Shortness of Breath
62.7%	58.2%	50.0%

Table 2

Triggers of Asthma, (%).

Environmental Allergens	Respiratory Infections	Cold Weather	Exercise
71.2%	58.2%	57.2%	52.7%

Table 3

Diagnosis of Pediatric Asthma (%) and.

Clinical Symptoms	Spirometry	Laboratory Tests
77.5%,	17.5%,	5.0%
Gender differences in the prevalence of asthma		
Males	Females	p-value
56.7%	51.5%	0.03

Table 4

Gender Differences in Clinical Symptoms of Asthma.

Males	Females	Both groups	p-value
Wheezing	Coughing	Shortness of Breath	0.77
63.3%	58.4%	50.3%	0.86
			0.91

Table 5

Gender Differences in Triggers of Asthma.

Males	Females		
Environmental Allergens	Respiratory Infections	Cold Weather	Exercise
71.2%	58.2%	57.2%	52.7%
p-value=0.37	p-value =0.83	p-value=0.99	p-value =0.54

Discussion

The findings of this research indicated that 54% of Pakistan's pediatric population had asthma. This is higher than the prevalence reported in other countries, such as the United States and Germany, where the prevalence of asthma is 10-15% (Tanaka, Miyake, Arakawa, Sasaki, & Ohya, 2007). The higher prevalence in Pakistan may be due to differences in environmental exposures, genetics, and/or lifestyle factors. The most common clinical symptoms reported by the children were wheezing, coughing, and shortness of breath. These symptoms are consistent with those reported in other studies of pediatric asthma(Trosman, 2013). The majority of the children reported that their asthma symptoms were triggered by environmental allergens, respiratory infections, cold weather, and exercise. This is in line with previous studies, which have identified environmental exposures and respiratory infections as important triggers of asthma exacerbations(Organization, 2014). The most common diagnosis of pediatric asthma in this study was based on clinical symptoms. This is consistent with other studies, which have reported that the majority of pediatric asthma cases are diagnosed based on clinical symptoms. This highlights the importance of recognizing the clinical symptoms of asthma and referring patients for further testing if necessary (AL-RIYAMI, AL-RAWAS, AL-RIYAMI, Jasim, & Mohammed, 2003). Furthermore, this suggests that there is a need for educationalprograms to increase awareness of the clinical symptoms of asthma and to promote the appropriate diagnosis and management of the disease (Health, 1995; Lung & Institute, 2006; Matovic, Milovanovic, Dajic, Stojkovic, & Jankovic, 2018; Tohidinik, Mallah, & Takkouche, 2019).

Conclusion

The findings of this study suggest that asthma is a significant health concern among the pediatric population in Pakistan, with the majority of asthma cases being diagnosed based on clinical symptoms. Future research should focus on the management of asthma and the development of educational programs to reduce the prevalence of asthma in the pediatric population.

Limitations

This study has several limitations. First, the sample size was relatively small and may not be representativeof the wider population. Second, the study was conducted in a single urban hospital and may not be generalizable to other settings. Third, the

questionnaire used in this study was self-reported and may not have captured all of the relevant information. Finally, the study relied on clinical symptoms for the diagnosis of asthma and did not take into account laboratory tests or spirometry.

Future Finding

Future research should focus on the development of effective interventions to reduce the prevalence of pediatric asthma in Pakistan. Such interventions should include the promotion of healthy lifestyles, the identification and avoidance of environmental triggers, and the development of asthma management programs. Additionally, further research is needed to explore the impact of socioeconomic factors on theprevalence of pediatric asthma. Finally, future studies should examine the long-term outcomes of pediatric asthma, such as hospitalizations and mortality.

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