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SOCIO-DEMOGRAPHIC CHARACTERISTICS OF CHILDHOOD ASTHMA IN MISAN

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ABSTRACT

Background: Asthma is one of the most common chronic diseases in children, posing a significant burden on families and society. Its prevalence has sharply increased over the past 30 years with notable geographical variations. This study aimed to investigate sociodemographic and other risk factors associated with asthma in children attending the asthma clinic at Misan Child and Maternity Hospital, Amara City, Iraq. Objective: To identify the sociodemographic characteristics and risk factors of asthma among children under 14 years diagnosed with bronchial asthma. **Method:** A cross-sectional retrospective study was conducted on 200 children diagnosed with asthma based on history and physical examination. Data collection occurred over six months, from September 2019 to March 2020, using a specially designed questionnaire filled through direct caregiver interviews. **Results:** Asthma was most frequent in the 2–6 years age group (34.5%) and predominantly affected males (67%). Although males had higher exposure to asthma risk factors, the gender difference was not statistically significant concerning symptom presentation or severity. Urban residents accounted for 90.5% of cases, compared to 9.5% in rural areas, yet no significant association was found between residence and asthma occurrence. Common risk factors included a family history of asthma or allergies (e.g., allergic rhinitis, eczema, or food allergy), male gender, and environmental tobacco smoke exposure. **Conclusion:** Asthma is a significant public health issue among Iraqi children. The highest frequency was observed in the 2–6 years age group, with males and urban residents being more affected. Addressing family history and environmental factors could mitigate the burden of asthma.

KEYWORDS: Socio-demographic, Childhood, Asthma, Misan.

INTRODUCTION

Asthma is a chronic inflammatory condition of the lung airways resulting in episodic airflow obstruction. This chronic inflammation increases airway hyper-responsiveness (AHR) to common exposures such as allergens, infections, and irritants, leading to episodic and reversible airway constriction and inflammation.[1] Despite advances in treatments and guideline-based care, asthma remains a significant public health issue, contributing to substantial medical care costs, school absences, and work loss, thereby burdening communities.[2] The Global Initiative for Asthma (GINA) defines asthma as a heterogeneous disease characterized by chronic airway inflammation and associated with recurrent or persistent respiratory symptoms such as wheezing, shortness of breath, chest pain, and cough. These symptoms vary in intensity over time and are associated with variable airflow obstruction. Asthma can be triggered by allergen exposure, weather changes, exercise, or infections. In many cases, symptoms may resolve spontaneously or with treatment, complicating its diagnosis.[3] Globally, asthma prevalence has risen sharply over the last three decades. In 2005, the World Health Organization (WHO) estimated that 300 million people were affected by asthma, and projections suggest this number may reach 400 million by 2025.[4] Asthma prevalence varies geographically, with higher rates observed in urban areas compared to rural regions, where exposure to allergens and pollutants is less frequent. In the U.S., over 10 million children were diagnosed with asthma in 2011, representing 14% of children.[5] In the Middle East, asthma prevalence is 23% in Iraq and Saudi Arabia, significantly higher than in neighboring countries such as Jordan (4.1%) and Turkey (14.1%).[6] Asthma is influenced by genetic, environmental, and host factors. Genetic predisposition, viral infections, and environmental pollution, including tobacco smoke, are among the most common risk factors.[7] Asthma's

complex pathophysiology involves immune-mediated inflammation, resulting in intermittent and reversible obstruction of the airways due to environmental or viral triggers. Pediatric asthma presents with distinct phenotypes, including transient early wheezing, non-atopic wheezing, and atopy-associated wheezing, which vary in their triggers and progression.[8]

The "hygiene hypothesis" suggests that early exposure to microbes can promote a non-allergic immune response, potentially protecting against asthma. In contrast, limited microbial exposure in childhood may predispose individuals to allergic diseases, highlighting the importance of early environmental exposures in immune system development.[9] Moreover, allergen exposure and viral infections, particularly human rhinovirus, are synergistic in asthma development and exacerbations.[10]

Environmental factors such as air pollution and tobacco smoke significantly contribute to asthma prevalence and severity. Early-life exposure to pollutants like particulate matter and nitrogen dioxide has been associated with increased asthma incidence.[11] Additionally, breastfeeding has shown a protective effect against asthma development due to its immunomodulatory properties and influence on gut microbiota, which play a critical role in immune system development.[12,13] The aim of study is to identify the sociodemographic characteristics and risk factors of asthma among children under 14 years diagnosed with bronchial asthma.

METHOD

This study was conducted in the Pediatric Asthma Clinic at Misan Child and Maternity Hospital, which receives cases directly from its consultation unit or referred cases from Primary Health Care Centers (PHCCs) throughout Misan. The data collection period spanned six months, from 1st September 2019 to 1st March 2020.

A retrospective cross-sectional study design was adopted. The study included 200 patients aged up to 14 years who were diagnosed with asthma. A specially designed questionnaire form was used to collect relevant data, including sociodemographic information and clinical history. The primary data source was direct interviews with the parents or relatives of the patients.

Inclusion Criteria: The study included all children under 14 years who attended the Pediatric Asthma Clinic with a history of recurrent wheezing and dyspnea diagnosed as asthma. Participation required consent from the child's parents or relatives.

Exclusion Criteria: Children were excluded if they.

1. Presented with acute dyspnea accompanied by fever.
2. Had congenital heart disease with asthma.
3. Had undergone cardiopulmonary resuscitation.
4. Were older than 14 years.
5. Had caretakers who refused to participate in the study.

Ethical Considerations: Consent was obtained from the parents or legal guardians of the children before participation. The study adhered to ethical standards to ensure patient confidentiality and voluntary participation.

Data Analysis: Data were analyzed using the Statistical Package for Social Sciences (SPSS, version 24). Descriptive statistics were presented as frequencies and percentages. The chi-squared test was used to assess the significance of differences between proportions, with a p-value < 0.05 considered statistically significant.

RESULTS

The study findings revealed that the highest frequency of asthma was observed in the age group of 2–6 years, comprising 69 patients (34.5%), whereas the lowest frequency was noted in the 0–2 years' age group, accounting for 35 patients (17.5%) (Table 1). Asthma prevalence increased with age during the early years, with 17.5% of patients experiencing wheezing attacks in the first two years of life and 34.5% in the 2–6 years' age group. However, prevalence steadily decreased with advancing age, recorded at 27% for children aged 6–10 years and 21% for those aged 10–14 years.

Asthma was more frequently observed among males (n=134, 67%) compared to females (n=66, 33%). Additionally, the majority of asthma cases (90.5%) were reported among urban residents, while only 9.5% of cases were from rural areas. Regarding clinical presentation, although males exhibited a higher prevalence of asthma, no statistically significant differences were found between genders in terms of symptom presentation or severity. Nighttime symptoms were reported in 76% of patients (male: 77.6%, female: 72.7%, p=0.447). Daytime symptoms were observed in 47.5% (male: 48.5%, female: 45.5%, p=0.684), and exercise-induced symptoms were present in 43.5% (male: 43.3%, female: 43.9%, p=0.93). History of previous hospitalizations was reported in 48% of patients (male: 46.3%, female: 51.5%, p=0.485) (Table 2).

Environmental risk factors associated with asthma were also evaluated. Among patients, 43% had a history of tobacco smoke exposure, and 37% reported the presence of domestic animals at home. Feeding practices during infancy showed that 41% of asthmatic patients were breastfed, 34% were bottle-fed, and 25% received mixed feeding. Family history was identified as a major risk factor, with 67.5% reporting a family history of allergic rhinitis, 64% with a family history of asthma, 26% with a history of skin allergies, and 16% with a history of food allergies. However, no significant associations were found between these factors and asthma occurrence (p=0.54, p=0.63, p=0.73, and p=0.72, respectively) (Tables 3 and 4).

Table 1: Demographic Characteristics of Asthmatic Patients, Misan, 2020.

Category	Total No. of Cases	%
Age groups (years)		
0–2 years	35	17.5%
2–6 years	69	34.5%
6–10 years	54	27%
10–14 years	42	21%
Gender		
Male	134	67%
Female	66	33%
Residence		
Urban	181	90.5%
Rural	19	9.5%

Table 2: Prevalence of Asthma Symptoms and Presentation in Relation to Gender.

Symptoms	Boys (n=134) No. (%)	Girls (n=66) No. (%)	Total (n=200) No. (%)	P-value
Night symptoms	104 (77.6%)	48 (72.7%)	152 (76%)	0.447
Day symptoms	65 (48.5%)	30 (45.5%)	95 (47.5%)	0.684
Exercise-induced symptoms	58 (43.3%)	29 (43.9%)	87 (43.5%)	0.93
Previous hospitalization	62 (46.3%)	34 (51.5%)	96 (48%)	0.485

Table 3: Distribution of Study Population According to Bronchial Asthma Risk Factors, Maysan, 2020.

Environmental Risk Factors	No.	%
Environmental tobacco smoke	86	43%
Domestic animals	74	37%
Breastfeeding	82	41%
Bottle feeding	68	34%
Mixed feeding	50	25%
Family history of asthma	128	64%
Family history of allergic rhinitis	135	67.5%
Family history of skin allergy	52	26%
Family history of food allergy	32	16%

Table 4: Comparison between Rural and Urban Asthmatic Patients in Relation to Some Risk Factors.

Risk Factors	Urban (n=181) 90.5%	Rural (n=19) 9.5%	Total (n=200)	P-value
Family history of asthma	114 (89%)	14 (10.9%)	128 (64%)	0.63
Family history of allergic rhinitis	120 (88%)	15 (11%)	135 (67.5%)	0.54
Family history of skin allergy	46 (88%)	6 (11.5%)	52 (26%)	0.73
Family history of food allergy	28 (87.5%)	4 (12.5%)	32 (16%)	0.72

DISCUSSION

Asthma is one of the most common chronic diseases in children, with the highest frequency observed in younger age groups. In this study, children aged 2–6 years had the highest prevalence of asthma (34.5%), while those aged 0–2 years had the lowest prevalence (17.5%). Children under 6 years old accounted for 52% of asthma cases in the study population, consistent with other research's findings. That 43.3% of asthmatic children in Mosul were under 4 years old, and 41.8% of cases in children under 3 years. Similarly, Salma et al. in Sudan found 54.8% of asthma cases in children under 5 years. Globally, around 80% of asthma cases begin before the age of 5, although diagnosing asthma in children under 5 years can be challenging due to overlapping respiratory symptoms.[14-16] This study found that asthma was more prevalent in males (67%) than females (33%), aligning with findings from Yassen et al. in Mosul (70% males) and Al-Kubaisy et al. in Baghdad, where males were more affected. This male predominance is consistent with findings across the Middle East.[17,18] While some studies attribute this to sex hormones, others suggest cultural factors, such as males being more exposed to outdoor environments, could play a role. However, our study found no significant association between gender and asthma symptom severity, such as night symptoms (p=0.447), day symptoms (p=0.684), exercise-induced symptoms (p=0.93), or hospitalization (p=0.485). These findings are consistent with studies which also found no significant gender differences in asthma severity.[19,20,21] Patients residing in urban areas had a significantly higher asthma prevalence (90.5%) than those in rural areas (9.5%), consistent with studies by Al-Kubaisy et al. in Baghdad and Nadhem et al. in Hilla.[19,22] This urban predominance could be attributed to increased exposure to indoor allergens, such as house dust mites and pets, and indoor chemical pollutants. However, our study found no significant association between urban/rural

residence and asthma-related conditions such as allergic rhinitis (p=0.54), skin allergy (p=0.73), or food allergy (p=0.72). Interestingly, similar environmental conditions between urban and rural areas in Al-Amara, including exposure to air pollution from nearby brick factories, may account for this finding. In contrast, studies from Egypt by Shabban et al. reported higher asthma prevalence in rural areas.[23] Environmental tobacco smoke exposure was significantly associated with asthma, with 43% of patients in our study having a history of exposure. This finding aligns with studies by Yassen et al. and Shaaban et al., which also highlighted tobacco smoke as a key risk factor for asthma.[14,23] Public health education and intervention programs targeting tobacco smoke exposure could reduce this preventable risk factor.[24] Breastfeeding is often considered protective against asthma, yet our study found the highest asthma prevalence among breastfed children (41%) compared to bottle-fed (34%) and mixed-fed (25%) children. Similar findings were reported by Takemura et al., who observed a positive relationship between breastfeeding and asthma prevalence during preadolescence, and by Sears et al., who linked breastfeeding to increased allergen sensitivity and asthma risk in mid-childhood.[25,26] Further research is needed to explore this complex relationship. This study underscores the importance of addressing modifiable risk factors like tobacco smoke exposure and urban environmental conditions while advancing asthma management and prevention strategies in pediatric populations.

CONCLUSION

Iraqi youngsters in Misan suffer from asthma. The present study found that asthma was most common in children aged 2–6. Asthma prevalence is comparable to industrialized, developed nations, with men and urbanites having higher rates. Family history of bronchial asthma, allergic rhinitis, skin allergy, food allergy, male gender, and ambient tobacco smoke exposure were significant asthma risk factors.

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