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Original Research Article

The prevalence of atopic dermatitis among children aged between 6 months and 12 years attending primary health care clinics in Qatar 2018-2019

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ABSTRACT

Background: The prevalence of atopic dermatitis among children appears to have increased dramatically over the past decades. Such rapid increase in prevalence cannot be explained fully. Genetic factors, microbiomes (especially staphylococcus aureus infection), food allergy and environmental factors might play a role in such an increment. This study aimed to report the prevalence of atopic dermatitis among children aged 6 months to 12 years attending primary health care centers in Qatar during the year 2018 and 2019.
Methods: Cross-sectional retrospective data analysis of all registered cases having at least one visit in any of the 28 health centers dermatology clinics operated by PHCC with a verified diagnosis of atopic dermatitis
Results: Out of 4521 patients dermatology clinic visit, 1359 had atopic dermatitis during the period of 2018 and 2019, and the prevalence rate is 30.06 (95% CI 28.72-31.42). In this 1359 atopic dermatitis cases, mean age of patients was 5.09±3.53 years and ranged from 6 months to 12 years. In this 18.9% was <1 years, 41.43% was 1-5 years, 19.35% was 5-8 years and 21.04% was 8-12 years. Prevalence of AD is high in boys 31.42% than girls 28.81% and is high in Qatari population 34.4% than the non-Qatari population 28.7%. The most frequently prescribed medication group was topical emollients (89.8%) followed by antihistamine (81.24%) and antibiotics (56.73%). Steroids were prescribed only for 7.3% of cases.
Conclusions: In this study the prevalence of atopic dermatitis was remarkably very high in young children in Qatar. Further prospective research and more efforts are needed to develop a standard treatment regimen for allergic diseases in Qatar.

Keywords: Prevalence, atopic dermatitis, children, primary care, Qatar

INTRODUCTION

Atopic dermatitis (AD- also known as atopic eczema, or simply eczema) is a chronic inflammatory skin disease characterized by impaired epidermal barrier function, inflammatory infiltration, intense pruritus having a clinical course with exacerbations and remissions.[1] It is a complex disease with a wide spectrum of clinical presentations and combinations of symptoms. It can cause a significant burden on health-care resources and affect quality of life.[2] The hall mark of atopic dermatitis is the sensation of itch and subsequent scratching called

as the itch-scratch cycle. Individuals affected by AD, usually have genetically determined risk factors affecting the skin barrier function or the immune system.[3] Filaggrin (FLG) is an epidermal protein, which has a key role in skin barrier formation. However, genetic mutations of FLG associated with skin barrier defects allow the entry of antigens, which results in the production of inflammatory cytokines followed by an inflammatory response.[4] The two risk factors most consistently and strongly associated with AD are a family history of atopy and mutations in gene encoding filaggrin (FLG). Depending on disease severity, it has considerable adverse effect on the quality of life (e.g., through sleep disturbance).[5] Frequently it is associated with elevated serum Immunoglobulin E (IgE) levels, with personal or family history of atopic dermatitis, allergic rhinitis and/or asthma. Flares may be associated with seasonal changes, stress, activity, staphylococcal infection, or contact allergy.[5]

The prevalence of AD appears to have increased dramatically over the past decades. It is generally believed that such rapid increase in prevalence cannot be explained fully by genetic factors.[6] In children microbiomes (especially Staphylococcus aureus infection) and food allergy are also implicated. Environmental factors might play a role in such an increment.[7] Prevalence studies are important aids to planning health care, through these the magnitude of burden of disease can be established. A study done in Kuwait revealed that the prevalence of atopic disorders was comparable between countries of the Arabian Peninsula and highest in Qatar.[8] The prevalence of atopic dermatitis symptoms in a study done in Korea 2010 was 19.3% in children 0 to 3 years of age, 19.7% in children 4 to 6 years of age, 16.7% in children 7 to 9 years of age, and 14.5% in children 10 to 13 years of age ($p<0.001$).[9] In this study we aim to analyze the prevalence of atopic dermatitis among children between 6 months to 12 years attending primary health care corporation clinics in Qatar during the year 2018 and 2019.

METHODS

Study design and setting

This was a cross sectional retrospective study. Patient's data were extracted from the electronic medical records by the Health Information Management department in Primary Health Care Corporation (PHCC). Data retrieved for all registered cases having at least one visit in any of the 28 health centers dermatology clinics operated by PHCC with a verified diagnosis of atopic dermatitis during the year 2018 and 2019. There are 4521 cases was visited in dermatology clinic ≤12 years of age groups during the study period, among this 1359 has atopic dermatitis and were included in the study (all Nationalities). Qatar, a high-income economy Arab country in Middle East, has invested significantly in its health care system. This includes a publicly funded primary health care service delivered by PHCC which is the largest primary care provider. At the time of undertaking this study, PHCC had 28 primary health care centres (all accredited by Accreditation Canada International) distributed across the country. Every resident in Qatar is eligible to register with a PHCC health centre for a nominal annual fee and utilize its services.

Study population

Diagnosed Atopic dermatitis children, boys and girls aged 6 months to 12 years old visited all primary care clinics during the time of 2018-2019 were included in the study. Aged less than 6 months or greater than 12 years are excluded from study. Nonprobability sampling techniques were used.

Data collection process

Data was collected from the electronic medical records of the individual patients, which included patient demographic information including age, gender, date of visit, nationality, common symptoms presented, history of allergies, asthma, allergic rhinitis and medications prescribed.

All personal identifiers were removed to ensure confidentiality and privacy of the participants. Furthermore, all findings will be protected and not used for any other purposes except for those indicated about the research according to the data protection regulations.

Statistical analysis

The statistical analysis was performed by STATA 15.1 (College Station TX USA). Descriptive statistics were used this study. Prevalence of atopic dermatitis estimated, age and number of visits were described as mean and standard deviation, age groups, gender, nationality, and medications were described frequency and percentage. Distribution of cases by year and month were reported.

RESULTS

There are 4521 registered children ≤12 years of age groups visited the dermatology clinics during the period of 2018 and 2019, among this 1359 children have atopic dermatitis. Total of 1359 cases were identified as atopic dermatitis in this study period. Mean age of subjects is 5.09±3.53 years ranged from 6 months to 12 years. Among 1359 subjects 247 (18.18%) children was <1 years, 563 (41.43%) children were with age 1-5 years, 263 (19.35%) children with were 5-8 years and 286 (21.04%) children aged with 8-12 years. Gender was equally distributed, 28% Qatari and 72% was non-Qatari. 30.39% of cases presentation with asthma and 8.90% of the cases were allergic rhinitis. Average number of visits for the patients was 1.41 and minimum number of visits was 1 and maximum was 10 visits (Table 1). Total AD

prevalence was 30.06 (95% C.I 28.72-31.42) among this study population.

Among young children aged 6 months to 1 year the prevalence was very high 41.79% and is followed by children with age 8-12 years 32.8% and for children those aged 1-5 years have 29.3% prevalence and among the children aged 5-8 have comparatively low prevalence of 23.05%.

Prevalence of AD is high in boys 31.42% than girls 28.81% and is high in Qatari population (34.4%) than the non-Qatari population (28.7%) (Table 2). As shown in (Table 3), nine categories of medications were considered and assessed for being used at least once by an AD child during the study period. The most frequently prescribed medication group was topical emollients 89.77% and its average number of pharmacy orders was 3.58 followed by antihistamines 81.24% with average number of pharmacy orders 3.23 and then by antibiotics 56.73% with average number of pharmacy orders 2.24.

Steroids were prescribed only for 7.43% children and average number of pharmacy orders was 1.50. About 4% children received keratolytic and average number of pharmacy orders was 1.43. And 2.35% children received topical anti-infectives with average number of pharmacy orders 1.15 and is followed by antiseptics 1.03% with average number of pharmacy orders 1.08 and 0.96% antiviral treatments with average number of pharmacy orders 1.08.

The trends of cases in 2018 and 2019 is depicted in (Table 4). There were a 55% significant increase of cases in 2019 than 2018 (Figure 1).

Table 1: Sociodemographic characters (N=1359).

Variables	N	%
Age (years)	Mean=5.09±3.53 years	
<1	247	18.18
1-5	563	41.43
5-8	263	19.35
8-12	286	21.04
Gender		
Male	679	50
Female	680	50
Nationality		
Qatari	379	28
Non-Qatari	980	72
Clinical presentation		
Asthma	413	30.39
Allergic rhinitis	121	8.90
Number of visits	Mean=1.41±0.87 visits	

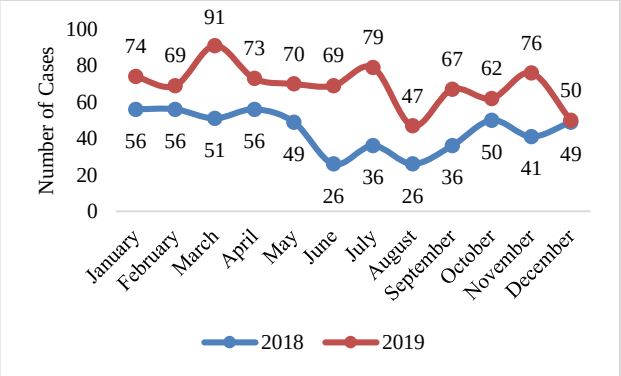

Figure 1: Trends of atopic dermatitis cases in 2018 and 2019.

Table 2: Prevalence rate based on age, gender, and nationality (N=1359).

Variables	N	Total population	Prevalence	95% CI
Age (years)	Mean=5.09±3.53 years			
<1	247	591	41.79	37.78 - 45.88
1-5	563	1916	29.38	27.35 - 31.48
5-8	263	1141	23.05	20.63 - 25.61
8-12	286	873	32.76	29.65 - 35.98
Gender				
Male	679	2161	31.42	29.47 - 33.42
Female	680	2360	28.81	26.99 - 30.68
Nationality				
Qatari	379	1102	34.39	31.59 - 37.28
Non-Qatari	980	3419	28.66	27.15 - 30.21

Table 3: Medications prescribed and dispensed.

Medications	Number of cases received Rx	%	No. of orders (mean±SD)
Antibiotics	771	56.73	2.24±1.57
Antifungal	73	5.37	1.21±0.50
Antihistamines	1104	81.24	3.23±2.63
Antiseptics	14	1.03	1.14±0.36

Continued.

Medications	Number of cases received Rx	%	No. of orders (mean±SD)
Antivirals	13	0.96	1.08±0.28
Keratolytic	54	4	1.43±0.79
Steroids	101	7.43	1.50±1.38
Topical anti-infectives	32	2.35	1.15±0.36
Topical emollients	1220	89.77	3.58 ±2.84

Table 4: Trend of cases 2018-2019.

Month	2018	2019
January	56	74
February	56	69
March	51	91
April	56	73
May	49	70
June	26	69
July	36	79
August	26	47
September	36	67
October	50	62
November	41	76
December	49	50
Total	532	827

DISCUSSION

The International study of asthma and allergies in childhood (ISAAC) reported that atopic dermatitis affects children across the globe and the disease prevalence is varying considerably between countries.[10] In developing countries prevalence of AD is increasing drastically.[10] In this retrospective study, we aimed to evaluate the prevalence of atopic dermatitis in children aged 6 months to 12 years old attending primary health care settings in Qatar. During the study period among 4521 children population, we found that the prevalence of atopic dermatitis was 30.06%.

Among young children aged 6 months to 1 year the prevalence was very high 41.79% and is followed by children with age 8-12 years 32.8%. Prevalence of AD is high in boys 31.42% than girls 28.81% and is high in Qatari population 34.4% than the non-Qatari population 28.7%. Very rarely studies discussed about the utilization of primary care settings for AD. The results reported here were showing higher prevalence of AD in children than those of many neighboring countries like Saudi Arabia, UAE, and Oman.[11]

Our study results are consistent with the current Global asthma network study published from the secondary care data from Qatar.[12] According to them when they compare the previous global asthma network study in Qatar back in 2006 showed that noticeable increase in diagnosed eczema (37.4% vs. 22.5%) rates. When comparing these findings to rates from the Gulf region, these rates are higher than those reported for allergic diseases in school children in Saudi Arabia (24%), United Arab Emirates (13%) and in Kuwait (12%).[13-15]

Based on the ISAAC questionnaire among Korean school children, the reported prevalence was 20.8% for atopic dermatitis.[16] Moreover, the findings of our study are consistent with the upward trend found in some of these Gulf countries. On a global level, the findings of our study are in concurrent with the increase in prevalence rates reported in other areas in the world, as in Mexico, South Africa, or Bangkok. A study that assessed the worldwide trend of allergic disease symptoms across multiple centres from several countries, reported an increase in the prevalence of these symptoms in Latin America, Africa, and certain areas in Asia.[17-20] In relation to gender, males in our study had higher diagnosed AD rates in all age groups. This comes in line with findings from the recent study from Qatar and previous studies form UAE, Oman and Bahrain.[21-24] However, it expands on the previous epidemiologic study of AD in adults and children from several industrialized countries in North America, Europe, and Asia by providing the estimates of the paediatric prevalence of AD in those countries and other countries encompassing different regions of the world.[11] The prevalence of all atopic disorders was comparable between countries of the Arabian Peninsula and highest in Qatar. The overall reported prevalence of eczema ranged from 7.5 to 22.5%.[8]

Regional and ethnic diversity may play a significant role in variable rates of prevalence in the Middle East. For instance, prevalence differs between countries of Semitic (Qatar, Oman, Saudi Arabia) and Persian (Iran) origin, and between urban and rural or desert regions in Iran.[25] Climate conditions in Africa and the Middle East are also likely contributors to the burden of AD. In Iran and Saudi Arabia, desert conditions are associated with higher burden of AD because high temperatures and low humidity exacerbate dry skin.[26,27] In Africa, high humidity and temperature promote growth of allergens, including mold.[28] A series factors including age, residence status (urban or rural district), exposed to passive smoking, premature birth, breast-feeding, pet ownership, delivery pattern and choosy in food were previously considered to be associated with AD prevalence and evaluated in multiple studies.[29] According to the guidelines of care for the management of atopic dermatitis AD treatment and management are subdivided into 4 sections.[30] Nonpharmacologic interventions such as moisturizers, prescription emollient devices, bathing practices and oils, and wet wraps are used for the treatment of atopic dermatitis. Following agents used as monotherapy or in combination with other topical agents for the treatment of atopic dermatitis. Topical corticosteroids, Topical calcineurin inhibitors, Topical antimicrobials/antiseptics, Topical antihistamines, Others

(e.g., coal tar, phosphodiesterase inhibitors).[31] The most frequently prescribed nonpharmacologic intervention in this study group was topical emollients 89.77% and it is consistent with the mentioned guidelines. However, there are some variations in the pharmacologic intervention of this study group as the prescription of topical emollients was followed by antihistamines 81.24% and antibiotics 56.73%. And the steroids were prescribed only for 7.43% children and about 4% children received keratolytic, 2.35% children received topical anti-infectives, antiseptics 1.03% and 0.96% antiviral treatments. Number of pharmacy orders for AD was not studied in other studies. This need to be studied further. The trends of cases in 2018 and 2019 shows that. There were a 55% significant increase of cases in 2019 than 2018. On a global level, the findings of our study are in concurrent with the increase in prevalence rates reported in other areas in the world, as in Mexico.[17]

Limitations

Cross-sectional studies have well-known limitations inherent to their design. In addition, the calculation of prevalence rate may suffer from bias because using the registered cases as the population at risk is not an accurate representation for catchment area and some of the atopic dermatitis cases prefer to receive care in private hospitals. Additionally, the findings cannot be generalized to other children in Qatar, due to the fact that the study only included primary care data, secondary care data weren't included. A prospective cohort study would more easily allow to draw conclusions about risk factors and the relationships among the atopic diseases.

CONCLUSION

In this study the prevalence of atopic dermatitis was remarkably very high in young children in Qatar. Although common and often mild, atopic dermatitis can be a challenging condition to manage. We recommend a stepwise approach and the combination of general and specific measures to gain control of this condition. Further prospective research and more efforts are needed to develop a standard treatment regimen for allergic diseases in Qatar. Such studies may provide basis for future control and preventive strategies for atopic dermatitis in children.

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