

Original Article

## Prevalence of Atopic Dermatitis Among Libyan Asthmatic Children

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### ABSTRACT

**Background:** Atopic dermatitis (AD) is a common, chronic, relapsing, itchy, skin condition occurring in patients with a personal or family history of atopy, and there is clinical association among different allergic disease in a way that treating one of them will improve the other. Many studies worldwide showed presence of AD in asthmatic children with different prevalence among countries and showed clinical improvement in asthma control on treatment of atopic dermatitis. Therefore, this study was conducted to assess the prevalence of atopic dermatitis among Libyan asthmatic children. **Methods:** This is an observational cohort study on asthmatic Libyan children who were treated and followed up at Tripoli children hospital in Tripoli, Libya. It carried out on 300 children suffering from asthma admitted from pediatric outpatient department as well as from emergency department and asthma clinic over a period of 24 months; from December 2017 to December 2019. The parents were asked to complete a questionnaire to collect the needed information after their consent being taken. To assure the accuracy and consistency of the methodology (sampling procedure, measurements, and a collection of the data), a standardized protocol was prepared. Data were entered in SPSS statistical package and consequently were analyzed and presented as descriptive statistics. **Results:** The prevalence of atopic dermatitis among asthmatic Libyan children was 16.7% in our study. The results showed significant relationship between address and prevalence of atopic dermatitis. **Conclusion.** Further studies are required to address the ethnicity, environmental factors, skin type and others attributed to this problem and we recommend all pediatricians to look for AD in asthmatic children and treat it accordingly.

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**Keywords:** Atopic dermatitis, asthma, children

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### INTRODUCTION

Atopic dermatitis (AD) is a chronic, pruritic inflammatory skin disease of unknown origin that usually starts in early infancy, but also affects a substantial number of adults. AD is commonly

associated with elevated levels of immunoglobulin E (IgE). Most AD patients had family histories of asthma, allergic rhinitis, allergic conjunctivitis, and other atopic diseases. That it is the first disease to present in a series of allergic diseases—including food allergy, asthma, and allergic rhinitis, in order—

has given rise to the “atopic march” theory, which suggests that AD is part of a progression that may lead to subsequent allergic disease at other epithelial barrier surfaces [1,2]. AD may be associated with other atopic (immunoglobulin E [IgE]–associated) diseases (eg, acute allergic reaction to foods, asthma, urticaria, and allergic rhinitis) [3].

AD has enormous morbidity, and the incidence and prevalence appear to be increasing. Further, AD is the first disease to present in a series of allergic diseases such as food allergy, asthma, and allergic rhinitis (in order), provoking the “atopic march” theory, which suggests that early or severe AD and cutaneous sensitization to environmental allergens may lead to subsequent allergic disease at other epithelial barrier surfaces (e.g. gastrointestinal or respiratory tract).

This hypothesis is supported by cross-sectional and longitudinal studies [1]. Atopic dermatitis primarily affects children in urban areas or developed countries, and prevalence has increased over the last 30 years; up to 20% of children and 1 to 3% of adults in developed countries are affected. Most people with the disorder develop it before age 5, many of them before age 1. The unproven hygiene hypothesis is that decreased early childhood exposure to infectious agents (ie, because of more rigorous hygiene regimens at home) may increase the development of atopic disorders and autoimmunity to self-proteins; many patients or family members who have atopic dermatitis also have asthma or allergic rhinitis.

Atopic dermatitis (AD) is a chronic inflammatory skin disorder. Like other allergic diseases, the prevalence of atopic dermatitis appears to be rising. In children, the prevalence of AD has increased from 3 -4% in the 1960’s to 10-15% in the 1980’s. But unlike many other diseases, AD has no primary skin lesions or pathognomonic test. Therefore, the diagnosis of

atopic dermatitis has to be made by constellation of physical findings.

In Libya, there are limited data on the epidemiology of allergic disorders. The objective of this study was to determine the epidemiology of AD among asthmatic children at Tripoli children hospital, Tripoli, Libya.

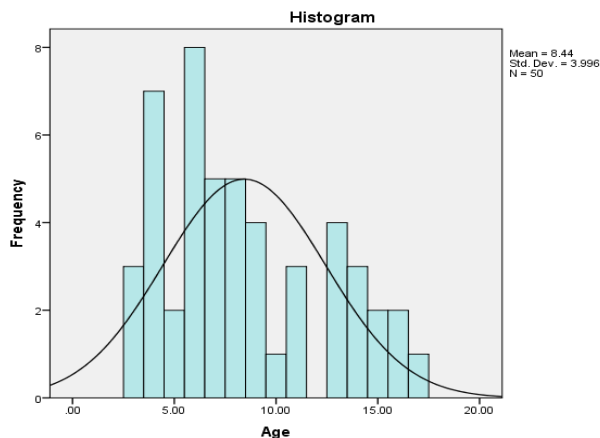
## METHOD

This is an observational cohort study on asthmatic Libyan children who were treated and followed up at Tripoli children Hospital in Tripoli, Libya. This study was carried out on 300 children suffering from asthma admitted from pediatric outpatient department as well as from emergency department and asthma clinic over a period of 24 months; from December 2017 to December 2019. The parents were asked to complete a questionnaire to collect the needed information after their consent being taken.

To assure the accuracy and consistency of the methodology (sampling procedure, measurements, a collection of the data), a standardized protocol was prepared. Data were entered in SPSS statistical package and consequently were analyzed and presented as a descriptive statistics.

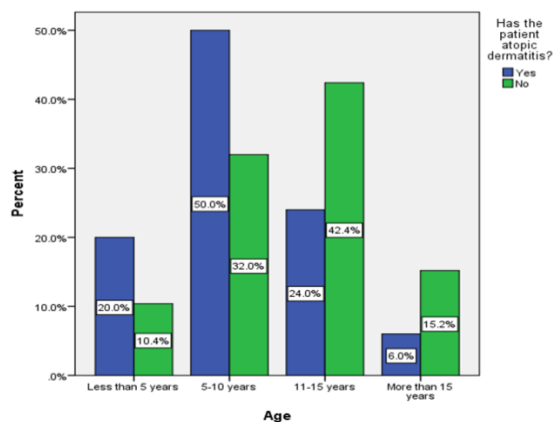
## RESULTS

This study as shown in (figure1) the mean of age with standard deviation were  $10.42 \pm 4.326$  years (range: one year - 19 years).



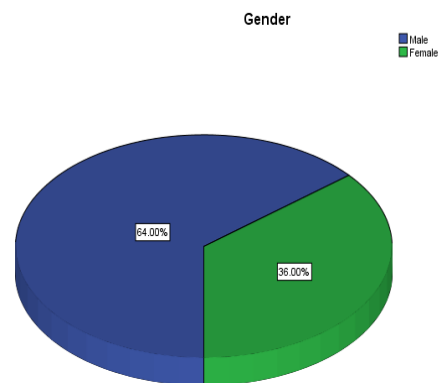
**Figure 1: AD frequency age distribution**

Also, the result showed that the mean age of atopic dermatitis patients were  $8.44 \pm 3.996$  years (range: 3 years - 17 years) (Figure 2).



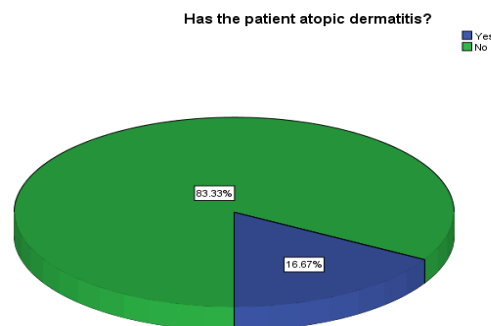
**Figure 2: Age group and prevalence of atopic dermatitis**

Result show that most affected age group is less than 10 years 70% of patients. Also, the results showed significant relationship between age group and prevalence of atopic dermatitis in this study ( $P < 0.05$ ). According to result of present study, atopic dermatitis affects males 32 (64.0%) more than females 18 (36.0%) (Figure 3).



**Figure 3: Gender wise distribution of subjects**

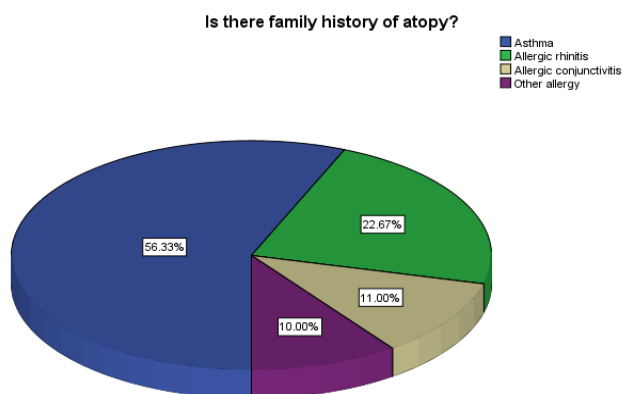
According to result of present study, statistical analysis not revealed significant differences between gender and prevalence of atopic dermatitis ( $p > 0.05$ ). The atopic dermatitis was present in 50(16.7%) among asthma cases in children. Out of 50 atopic dermatitis cases, 42 (84.0%) cases in Tripoli, 3 (6.0%) cases in Janzur, 3 (6.0%) cases in Ain Zara, and 2 (4.0%) cases in Tarhona (Figure 4).



**Figure 3: prevalence of AD in asthmatic Libyan children**

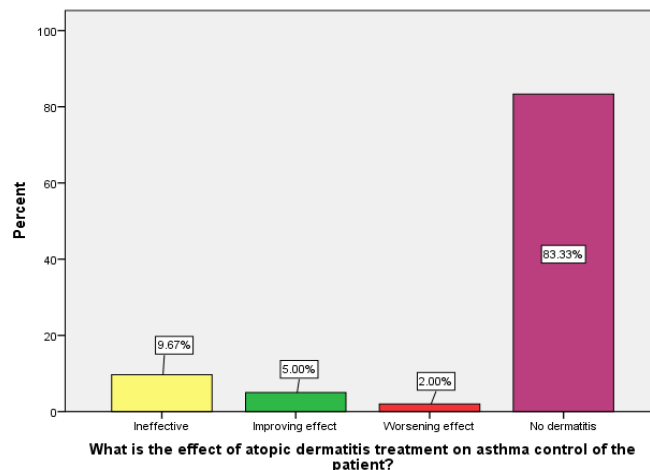
The current results showed significant relationship between address and prevalence of atopic dermatitis in this study ( $P < 0.05$ ).

A total of 300 subjects of Libyan nationality participated in this study. Out of 300 asthmatic patients in this study, 169 (56.33.0%) of them had family history of asthma, 68 (22.67%) of subjects had family history of allergic rhinitis, 33 (11.0%) of subjects had family history of allergic conjunctivitis, while 30 (10.0%) of them had family history of other allergy issues (Figure 5).



**Figure 4: Family history of other atopic diseases**

Out of 300 asthmatic patients in this study, 279 (93.0%) of them asthma was diagnosed first, while 21 (7.0%) of them dermatitis was diagnosed first. Out of 300 of asthmatic cases in this study, nature course of dermatitis was regressive in 18 (6.0%) of cases, progressive 22 (7.3%), and intermittent 10 (3.3%) of cases. Also the results showed no significant relationship between gender and natural course of atopic dermatitis in this study. ( $p > 0.05$ ). Out of 300 of asthmatic cases in this study, treatment of atopic dermatitis was ineffective in 29 (9.7%) of cases, improvement was in 15 (5.0%), and worsening effect in 6 (2.0%) of cases.



**Figure5: effect of AD treatment on asthma control**

Moreover, the results showed no significant relationship between gender and effect of atopic dermatitis treatment on asthma control of the patients in this study ( $P > 0.05$ ).

## DISCUSSION

This study targeted 300 asthmatic Libyan children who were treated and followed up in Tripoli children hospital in Tripoli, Libya. Over a period of 24 months; from December 2017 to December 2019. The mean age for the studied group was  $10.42 \pm 4.326$  years with a range between one years - 19 years, while the mean age of atopic dermatitis patients were  $8.44 \pm 3.996$  years (range: 3 years - 17 years). Regarding the age of the patients, we found that the majority of patients 35(70.0 %) cases below the age of 10 years. A similar result (70.2%) from a study in Ethiopia & another study from India shows a (83%) for children aged 2-10 years [15,16]. These percentages were anticipated in this age group as it involves both the infantile and childhood stages of the disease.

Concerning the sex of the patients, there is a slight male predominance (64.0%) of our patients was males and (36.0%) were females. Another study also shows a male predominance (65%males versus 35% females) in India [16], 51.4% males versus 48.6%

females in China [17], 50.4% males versus 49.6% females in Ethiopia [15].

Regarding the family history of atopy, it was positive in all of our patients. A study from China (17) shows a percent of 61.4%, &a series of studies from India shows a variable percentage concerned AD prevalence in asthmatics (65%) [(18), (42.3%), (36%) and (33.34%) [19-,21]. This may be explained by the fact that atopic dermatitis is one of a triad of atopic diathesis (asthma, atopic dermatitis and allergic rhinitis), that is why they considered it one of the major criteria of diagnosis.

## CONCLUSION

The atopic dermatitis prevalence was (16.7%) among asthmatic Libyan children in this study which is considered high. And the results showed significant relationship between address and prevalence of atopic dermatitis in this study. The treatment of atopic dermatitis was effective in in 15 (5.0%) of cases, then we need to investigate the reason and factors to improve the management of atopic dermatitis cases. Further studies will be required to address ethnicity, environmental factors, skin type, study features of atopic dermatitis, and their explanations. So, we recommend all pediatricians to look for AD in any asthmatic child and treat it accordingly.

### Disclaimer

The article has not been previously presented or published, and is not part of a thesis project.

### Declaration of interests

We declare no competing interests.

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