

Adolescents Food Habits as a Risk Factor for Asthma Incidence and Severity in Dubai

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Abstract

Background: Asthma is a large and growing threat to children's health and well-being. It affects 5-10% of the population or an estimated 23.4 million persons, including 7 million children in U.S. Asthma is the most common chronic disease of childhood. Almost 1 in 8 school-aged children are affected by asthma. Objectives: To study the food habits among adolescents and relation with incidence and severity of asthma among preparatory and secondary schools students in Dubai. Methodology: This is a cross sectional study, conducted among students in preparatory and secondary schools "Governmental and Private" in Dubai, U.A.E. Computer program EPI-Info version "6.04" was used for calculation of the minimum sample size required. A multistage stratified random sample was used. The strata were based upon geographical districts (Bur-Dubai and Diera), type of schools (governmental or private), educational grade (7th through 12th) and sex (males and females). The total sample size reached 1639 students. Results: The prevalence of asthma was higher among those who had a low AFHC score as compared to those with a high score (17% and 13.5% respectively), the same pattern was seen among those with medium AFHC score (16.6%) however the risk was not statistically significant. Results were confirmed by considering AFHC score as a continuous variable where when the mean AFHC score among asthmatics (10.6 ± 4.2) was compared with the mean score among non-asthmatics (10.8 ± 4.3) the difference was also found to be non-significant. There was no evidence that the risk of persistent asthma was associated with the AFHC score. The mean AFHC score among intermittent asthmatics (10.8 ± 4.2) was compared with the mean score among persistent asthmatics (10.4 ± 4.4) the difference was also found to be non-significant ($t=0.606$, $p=0.545$). Conclusion: Adolescents food habits are important. Even the differences were statistically not significant, future studies are needed in order to further investigate this issue. Appropriately designed intervention needs to be developed to address the risk of adolescent food habit.

Keywords

Asthma Severity, Incidence, Adolescents, Dubai

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1. Introduction

Asthma is a large and growing threat to children's health and well-being. (1) It affects 5-10% of the population or an estimated 23.4 million persons, including 7 million children

in U.S.(2) Asthma is the most common chronic disease of childhood. Almost 1 in 8 school-aged children are affected by asthma, and 10% of children (compared with 5% of adults) take medication for it. (3, 4) Worldwide, an estimated 300 million people are affected by asthma. Based on the application of standardized methods to the measurement of

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the prevalence of asthma and wheezing illness in children and adults, it appears that the global prevalence of asthma ranges 1–18% of the population in different countries. (5)

There is a good evidence that international differences in asthma symptom prevalence have been reduced, particularly in the age 13-14 year age group, with decrease in prevalence in North America and Western Europe and increase prevalence in regions where prevalence was previously low. Although there was little change in the overall prevalence of current wheeze, the percentage of children reported to have had asthma increased significantly, possibly reflecting greater awareness of this condition and/or changes in diagnostic practice.

The increases in asthma symptoms prevalence in Africa, Latin America and parts of Asia indicate that the global burden of asthma is continuing to rise, but the global prevalence differences are lessening. (6) Asthma is a leading chronic illness among children and youth in the United States. In 2007, 5.6 million school-aged children and youth (5-17 years old) were reported to currently have asthma; and 2.9 million had an asthma episode or attack within the previous year. On average, in a classroom of 30 children, about 3 are likely to have asthma. (7) In a study done in Egypt in 2009 the overall prevalence of asthma among school children was 7.7% (8% in urban areas and 7% in rural areas). (8) In a study conducted in State of Qatar, the school children aged from 6-14 year revealed a prevalence of bronchial asthma as high as 19.8 % in 2004.(9) In between 2007-2009 in Saudi Arabia (Riyadh), a study among the same age range (6-14) revealed that the prevalence of asthma among school children was 11.4% (10) while in Oman, the prevalence of asthma reached 10.5% and 20.7% in 6–7 and 13–14 years old Omani children respectively. (11)

The World Health Organization (WHO) has estimated that 15 million disability-adjusted life-years are lost annually due to asthma, representing 1% of the total global disease burden. Annual worldwide deaths from asthma have been estimated at 250,000 and mortality does not appear to correlate well with prevalence. There are insufficient data to fully explain the variations in prevalence within and between populations. Although from the perspective of both the patient and society the cost to control asthma seems high, the cost of not treating asthma correctly is even higher. (5) Children with asthma are at an increased risk of experiencing asthma-related respiratory symptoms in adult life. (12) Asthma is one of the leading causes of school absenteeism. In 2003, an estimated 12.8 million school days were missed due to asthma among more than 4 million children who reported at least one asthma attack in the preceding year. (13)

Low-income populations, minorities, and children living in

inner cities experience more emergency department visits, hospitalizations, and deaths due to asthma than the general population. (14) Two old studies on 1994 and 2000 in the UAE among students aged 6-13 showed that the prevalence of asthma was 13,6 % (27) and 13 % (15) respectively. In a recent study in the UAE, in Alain area which was held between 2007- 2010 showed that the prevalence of asthma in the group aged 13–19 years was 16%.

2. Objectives

To study the food habits among adolescents and relation with incidence and severity of asthma among preparatory and secondary schools students in Dubai.

3. Methodology

This is a cross sectional study, conducted among students in preparatory and secondary schools “Governmental and Private” in Dubai, U.A.E. Computer program EPI-Info version "6.04" was used for calculation of the minimum sample size required. The minimum sample size required was 855. A list of schools was obtained from the knowledge and Human Development Authority. Dubai includes 183 school spread along two large districts, Bur Dubai and Diera. Bur Dubai includes 90 schools, 69 private and 21 governmental, where Diera includes 93 schools, 72 private and 21 governmental. The numbers of students in preparatory and secondary stages are 42819 and 34299 respectively. Around 20289 of them in governmental schools, while 56829 are in private schools. This gives a total of 77118 students in both regions (private and governmental). A multistage stratified random sample was used. The strata were based upon geographical districts (Bur-Dubai and Diera), type of schools (governmental or private), educational grade (7th through 12th) and sex (males and females). The number of the governmental schools was less than that of private schools (42 and 141 respectively). According to the numbers of schools, a proportional allocation technique was used to determine the required sample size. A total of 16 private schools (8 from Bur Dubai and 8 from Diera), with 4 schools of boys and 4 schools of girls for each district were randomly selected. Also, 4 governmental schools (2 from Bur Dubai and 2 from Diera), with one school for each gender from each district were randomly selected. From each school one class was selected randomly from each educational grade. All the students in the selected classes were invited to participate in the study and all of them agreed to participate (response rate 100%). The total sample size reached 1639 students.

4. Results

Table (1) presents the prevalence of asthma according to the Adolescents Food Habits Checklist (AFHC) score. The prevalence of asthma was higher among those who had a low AFHC score as compared to those with a high score (17% and 13.5% respectively), the same pattern was seen among

those with medium AFHC score (16.6%) however the risk was not statistically significant. Results were confirmed by considering AFHC score as a continuous variable where when the mean AFHC score among asthmatics (10.6 ± 4.2) was compared with the mean score among non-asthmatics (10.8 ± 4.3) the difference was also found to be non-significant.

Table 1. Prevalence of asthma among preparatory and secondary school students according to their AFHC score (Dubai, 2011).

AFHC score	Total (1639)	Non Asthmatic (n=1366)		Asthmatic (n=273)		OR (95%CI)
		No.	%	No.	%	
High	89	77	86.5	12	13.5	1
Medium	650	542	83.4	108	16.6	1.2 (0.67-2.4)
Low	900	747	83.0	153	17.0	1.3 (0.69-2.5)
Mean± SD		10.8 ± 4.3		10.6 ± 4.2		P= 0.295

Table (2) shows that there was no evidence that the risk of persistent asthma was associated with the AFHC score. The mean AFHC score among intermittent asthmatics (10.8 ± 4.2) was compared with the mean score among persistent

asthmatics (10.4 ± 4.4) the difference was also found to be non-significant ($t=0.606$, $p=0.545$).

Table 2. Severity of bronchial asthma among asthmatic preparatory and secondary school students according to their AFHC score (Dubai, 2011).

AFHC score	Total (273)	Intermittent (n=200)		Persistent (n=73)		OR (95%CI)
		No.	%	No.	%	
High	12	7	58.3	5	41.7	1
Medium	108	83	76.9	25	23.1	0.42 (0.12- 1.4)
Low	153	110	71.9	43	28.1	0.55 (0.17- 1.8)
Mean ± SD		10.8 ± 4.2		10.4 ± 4.4		P= 0.545

5. Discussion

Dietary habits in relation to bronchial asthma were studied. The Adolescent Food Habits Checklist (AFHC) is a tool to measure the healthy eating habits designed specifically for use with adolescents. The AFHC refers to food choice situations in which adolescents are likely to have a degree of personal control. Furthermore, the AFHC focuses specifically on areas of the adolescent diet which present cause for concern, particularly the consumption of energy dense foods and fruit and vegetable intake. Items of this checklist were generated by dietitians and health psychologists. Unsound eating habits contribute to health problems. They tend to be established early in life, and young people who have unhealthy eating habits tend to maintain these habits as they age. (16) It was proved that more than half of the study sample recorded low score AFHC with mean value of 10.8 ± 4.3 which means bad dietary habits.

Although the mean AFHC scores revealed no statistical significant difference in concern with prevalence or severity of asthma but, the prevalence was apparently higher among those who had a low or medium AFHC score as compared to those with a high score however the risk was not statistically significant. Associations between an unhealthy diet and overweight and the presence of asthma were reported. The

high prevalence of childhood asthma in western societies cannot be explained by genetic background alone and is thus likely to be associated with environment as well as lifestyle. Less physical activity and a dietary change may contribute to the recent increase in asthma and atopy. (17) There is an evidence that a high level of unsaturated fatty acid dietary intake is related to an increase in prevalence of asthma and chronic obstructive pulmonary disease (COPD).

It has been hypothesized that the increase in asthma may, in part, be a consequence of changing diet, and early life dietary exposures might be particularly important in the development of childhood asthma. It is well known that changes in dietary habits, such as increasing salt intake, and decreasing intake of fruit and vegetables, contribute to the rise in asthma and COPD mortality and morbidity. (18) The Mediterranean diet is healthy eating pattern with protective effects on chronic diseases. It represents a set of healthy dietary habits including high consumption of vegetables and fresh fruits, with olive oil as the main source of fat. (19) The effect of this healthy diet was examined in a cross sectional study done in Portugal including 174 asthmatics where it showed that high adherence to Mediterranean diet reduced 78% the risk of non-controlled asthma after adjusting for gender, age, education, inhaled corticosteroids and energy intake. (20)

6. Conclusion

Adolescents food habits are important. Even the differences were statistically not significant, future studies are needed in order to further investigate this issue. Appropriately designed intervention needs to be developed to address the risk of adolescent food habit.

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