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Asthma Prevalence and Risk Factors among Medical Students in Taiba University in Almadinah Almonawara, KSA

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Abstract

Background: There is inadequate data concerning prevalence and risk factors of asthma among adults, more studies are needed, to support health authorities in asthma management.

Methods: This is a cross- sectional study done at Taiba University in Almadinah Almonawarah, Saudi Arabia, in March- April 2014 using a modified translated (ISAAC) questionnaire for adults and respiratory function test. The data was analyzed using Microsoft Excel version 2010.

Results: Out of 200 samples 124 were included, the rate of response was 62%, All students who are known cases of asthma and those who had lung function test suspecting asthma were included in the prevalence of asthma which was found to be 12.8%. The prevalence of allergic rhinitis was 21.77%, more among females and associated with asthma.

Keywords: Asthma; Allergic rhinitis; Prevalence; Dyspnea

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Introduction

There are about 300 million individuals suffering from asthma worldwide and numbers are still increasing [1]. In Saudi Arabia Al-Frayh et al. study revealed that the prevalence of asthma among school children increased from 8% in 1986 to 23% in 1995, [1] and the latest published paper about asthma prevalence in KSA is done by Mohammed O Al Ghobain in Al Riyadh and showed that the prevalence of asthma among adolescents 16-18 years old was 25.3% [2]. In Almadinah the most recent study was in 2009 showing a prevalence as high as 23.6% among children [3].

There is very few data available about prevalence and risk factors of adulthood asthma in KSA, between 2000 and 2013 out of 20 published papers on asthma prevalence and risk factors in KSA only 6 papers mentioned taking adult age group, besides none of the six papers was conducted in Almadinah. Therefore further studies are required to investigate adulthood asthma, to support health authorities to do more planning and protocols implementation with regard to asthma and allergy management. This study aims to determine the prevalence of asthma among adult medical students in Taiba University and to identify the risk factors and triggering factors of the disease.

Research Methodology

This is a cross sectional study done in Taiba university in Almadinah Almonawwarah, Saudi Arabia, in March- April 2014. Almadinah is located in the West of the KSA, approximately 150 km east of the Red Sea; its altitude is about 600m above the sea level. The area of Almadinah is around 589 km^2, 293 km^2 of this area is urban part [4]. It has 1180770 populations according to the latest statistics in 2010 [5]. Taiba University established in 2003, includes 22 collages, in 2013 academic year it had 60055 students [6].

Study population was medical students from first and second year, the sample size was 200 including 100 females and 100 males, all interested students 18 years and above were included.

A modified translated International Study of asthma and Allergy in Childhood (ISAAC) questionnaire for adults was administered to students. The students filled the questionnaire in physiology laboratory under the supervision of researchers, height and weight were measured and respiratory function test was done to all students.

The collected data in questionnaire included questions about exercise, energy source for cooking, presence of any chronic diseases and medications used, nearby factories, history of

rhinitis, dyspnea, if the student is smoking, the type of smoke, other smokers at home, and use of insecticides, presence of carpet, plants, animals, dust, smoke, chemicals, cockroaches, and bats at home or nearby.

For respiratory function test, the students were seated up straight, nasal respiration was prevented using nasal clip, students were instructed to take deep inspiration and blow forcefully till the end of expiration through mouth only and to repeat this 3 times.

The purpose of the study was explained to students and participants were assured that privacy of data would be kept, and then a written consent was signed by them.

Analysis of data

We used Microsoft Excel version 2010 to analyze data, via coding and entry of variables. Prevalence of asthma in males and females were calculated, the prevalence of risk factors in all research samples was calculated and the risk factors were analysed computing ORs and P value.

Results

A total of 200 questionnaires were distributed to students, but the collected complete questionnaires were 124, the rest of the samples were canceled because students did not attend respiratory function test. Boys completed 48 questionnaires, and girls completed 76. The Rate of response was 62%.

The characteristics of the study sample are shown in **Table 1**, this can be important for comparison purposes between this study sample and studies taking other samples with different characteristics.

It is clear in **Figure 1** that characteristics of study sample are very similar among males and females as we are describing the same society, but when it comes to exercise we see the great difference between males 75% and females 36.84%.

High percent of samples 43.55% have animals at home or in the surroundings 2/3rd of these animals are cats. other animals include birds, rabbits and dogs. 62.1% have plants at home or nearby, these plants include 41.7% date palms, 30.7% trees, and 27.8% flowers & herbs. Almost all students have air condition at home.

Prevalence of asthma

The prevalence of asthma was 12.8%. All students who are known cases of asthma (doctor-diagnosed asthma) and those who had lung function test suspecting asthma, that is (FVC/FEV1) equal to less than 80, were included in the prevalence of asthma. The prevalence of doctor-diagnosed asthma was 4%; this does not include students with childhood asthma which had resolved in adulthood **(Figure 2).**

Respiratory function test

Only 1/5th of doctor-diagnosed asthma samples had lung function test done for the diagnoses. This study respiratory function test results showed that none of doctor-diagnosed asthma samples have FVC/FEV1 ratio less than 80, 4/5 of them had FVC less than 80%. 8% of total sample had FVC/FEV1 ratio less than 80%, and 43.5% of them had FVC less than 80.

Risk factors

The prevalence of asthma in males and females was 12.5% and 13.2% respectively, the prevalence in males and females were very close, therefore gender was considered insignificant risk

Table 1 Characteristics of study sample.

Characteristics of participants and their environment	Males	Percent	Females	Percent	Total	Percent
Do exercise at least once a week	36	75.00%	28	36.84%	64	51.61%
Use electricity for cooking	14	29.17%	27	35.53%	41	33.06%
Use gas for cooking	32	66.67%	55	72.37%	87	70.16%
Live near factories	4	8.33%	2	2.63%	6	4.84%
Have smoker at home	12	25.00%	22	28.95%	34	27.42%
Use insecticides at home	23	47.92%	38	50.00%	61	49.19%
Have trucks pass nearby	24	50.00%	30	39.47%	54	43.55%
At home or nearby the following						
Dust	33	68.75%	52	68.42%	85	68.55%
Smoke	17	35.42%	21	27.63%	38	30.65%
Plants	30	62.50%	47	61.84%	77	62.10%
Animals	21	43.75%	33	43.42%	54	43.55%
Chemicals	12	25.00%	24	31.58%	36	29.03%
Cockroaches	22	45.83%	24	31.58%	46	37.10%
Bats	4	8.33%	1	1.32%	5	4.03%
Carpet	43	89.58%	69	90.79%	112	90.32%
A.C.	48	100.00%	75	98.68%	123	99.19%

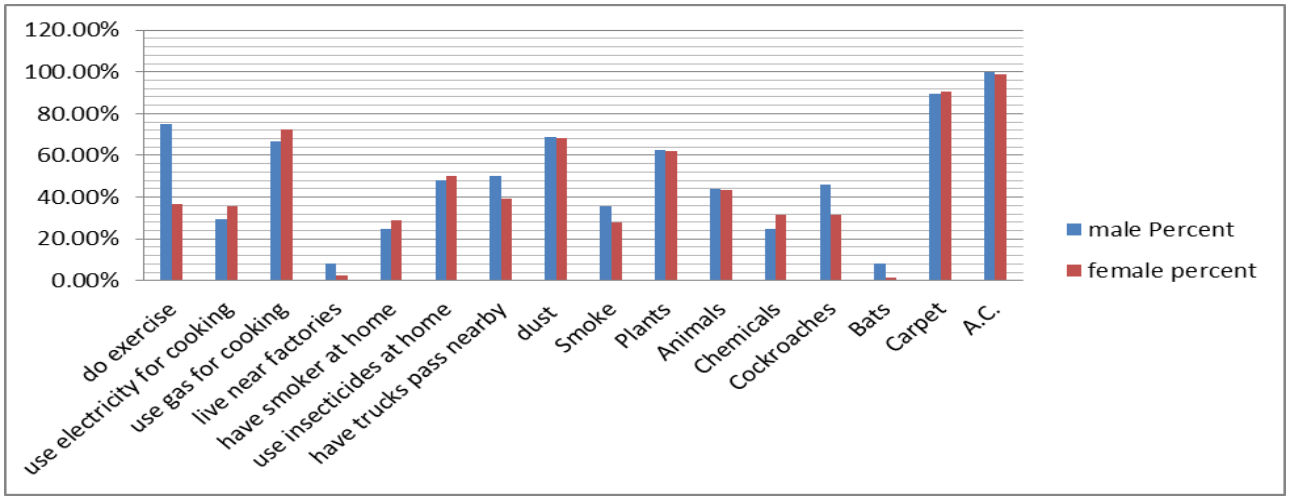

Figure 1 Characteristics of study sample.

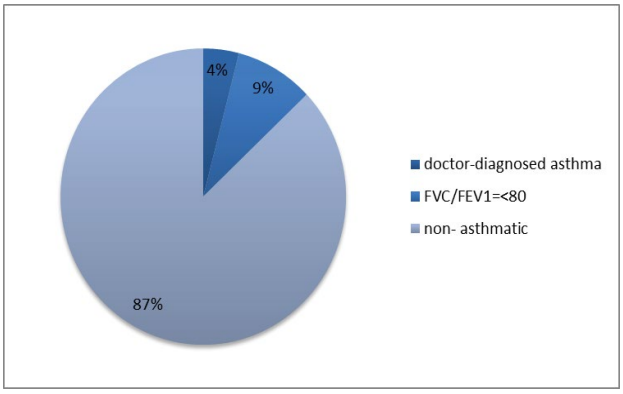

Figure 2 A pie chart showing prevalence to the disease.

factor for asthma.

The prevalence of allergic rhinitis was 21.77%, 14.58% among males and 26.32% among females, OR=2.09. Rhinitis showed high association with asthma OR 3.222 and p value <0.05.

Concerning BMI [7], we compared normal (BMI 18.5-25) versus overweight and obese (BMI >25), BMI more than 25 was significantly more associated with asthma the OR=3.206 and P<0.05. Regarding source of energy for cooking, 86.6% of asthmatic use gas and 13.3% use electricity the OR for using gas was 2.005.

The odd ratio for dyspnea was 1.7, having carpet at home was 1.7 and for dust 1.4. The odd ratio and P value of all other risk factor of asthma such as having a smoker at home, using insecticides, having plants, pets and cockroaches, appeared to be statistically insignificant as it is clear in **Table 2,** but this may be also related to the high awareness about asthma and its triggers, as families of asthmatic patients try to illuminate all triggers as a step in the control asthma attacks.

Table 2 Risk factors of asthma.

Risk factors	OR	P-value
Gender	1.061	0.915
No exercise	1.118	0.836
Using gas for cooking	2.005	0.367
Factories nearby	1.133	0.911
Rhinitis	3.222	<0.05
Dyspnea	1.68	0.374
smoker at home	0.573	0.405
Insecticides	1.038	0.945
Plants	0.422	0.105
Animals	0.75	0.601
Cockroaches	0.743	0.604
Carpet	1.701	0.619
Trucks	1.009	0.986
Dust	1.438	0.551
BMI >25	3.206	<0.05

Discussion

This is the first study to include respiratory function test in KSA, but this was the main reason for the low response rate in relation to other asthma studies. More than ninety percent completed questionnaire but only 62% completed questionnaire and respiratory function test.

In this study the prevalence of asthma was 12.8%, this prevalence is significantly less than the prevalence of asthma in Almadinah among school students 6-8 years old, done by Alnahhas et al. [3] which was 23.6%, this may be because large percent of childhood asthma remits in adulthood and due to the difference in criteria of individuals counted in the prevalence, Alnahhas [3] study took students who ever had wheeze. Al-Ghamdi study about

adulthood asthma in Asir showed relatively closer prevalence which was 19.5 at sea level and 6.9 at high altitude [8].

The odd ratio for the association of rhinitis with asthma in this study 3.2 matches the results in Alnahhas, Al-dawood, Almazam and Algobain studies which were 4.7, 2.2, 9.9 2.5 respectively [3,9-11].

Passive Smoking is a known risk factor and trigger for asthma, but in our study the odd ratio was (<1) indicated that it is not associated with asthma, similar results were achieved by Almazam [10], he found OR=0.9. But Al Dawood and Alshehri found OR 1.3 and 1.6. [9,12].

We found out that BMI >25 is a considerable risk factor for asthma, Alharbi et al. in a research about asthma and sleep apnea, discovered that the association between asthma and sleep apnea is linked to high BMI [13].

Conclusion

Respiratory function test is important in the diagnosis of asthma, for the reason that asthma is not always the cause of shortness of breath. Skipping respiratory function test may lead to proceeding in a wrong tract leaving the main cause of symptoms untreated. Studying already known risk factors of a disease in a society may not be a true measure of their correlation with the disease, but may be a useful measure of the society health education about the disease.

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