Advanced Medical Journal, Vol.9, No.2, P.19-26, 2024 https://doi.org/10.56056/amj.2024.253

Aggravating factors of asthma among patients visited respiratory center at Shar Hospital outpatient in Sulaymaniyah-Kurdistan-Iraq

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Abstract

Background and objectives: Asthma is a prevalent chronic disease in Kurdistan region. Identification of asthma triggers is essential in preventing and managing the disease. Our aim was to determine the most common aggravating factor of asthma in Suleimani city and assessing the correlation of age groups and gender to specific aggravating factors.

Methods: This data collection was an observational cross-sectional study implemented in the Outpatients clinics in Suleimani city-Kurdistan region/Iraq from 2018 to 2022. Study subjects included one hundred and fifty asthmatic patients (150). The diagnosis of asthma in selected patients was established prior to the study inclusions.

Results: The common aggravating factors of asthma as perceived by patients were air pollution (80.7%), dusts storms (76.7%), infection (74%), smoking (69.3%), exercise (66.7%), detergents (64.7%) and cold weather (64%). The triggers of asthma in adolescent and adult patients are different regarding age and gender.

Conclusions: The common triggers of asthma in asthmatic patients in Suleimani city are pollution, dusts, viral infection, and tobacco.

Keywords: Asthma, Kurdistan, Suleimani, Triggers

Introduction

Asthma is a heterogeneous disease usually characterized by chronic airway inflammation,Globally, more than three hundred million individuals are affected by asthma, while in United States alone, over than twenty-five million children and adults are suffering from asthma.[1] In Middle East countries, the prevalence of asthma is different from country to country and different from city to city in same country.[2] In Iraq, the asthma prevalence was (15.5%) in younger children, while the prevalence was (8.9%) in older age population.[3] Epidemiologically, the asthma is highly

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predominant in females than males and tends to be prevalent in childhood age group with high predominance of male gender in this age group.[4] In last decades, the asthma prevalence in children has been increased to double with increase in activity and severity of asthma among children.[5] Although the exact etiology of asthma is still uncertain and its etiology and aggravating factors are different from country to country, but the nature of pathophysiology of asthma which is an inflammatory process and the defective immunity play role in its development in both childhood and adult asthma. The asthma triggers included non-allergic irritants (smoke, aggressive odors, air pollutants and occupational exposures), drugs (beta-blockers, non-steroidal anti-inflammatory agents) weather (temperature and humidity) infections, emotions reflux food and exercise.[6] These triggers are accompanied in most cases with a significant decline of health-related quality of life among asthmatic children.[7] Asthma risk factors and prevalence of the clinical manifestation is not always correlating to each other, the common reported risk factors of asthma in children are maternal diet changes, fetal growth, low size of family, high use of antibiotics and high rate of vaccinations.[7] On other hand, these risk factors are not responsible of high prevalence rates of asthma among children. Additionally, the socioeconomic and environmental factors may play role in immune system changes in atopic asthma and asthma development.[8] The air pollution is a harmful substance in the air that exacerbate the asthma has been the subject and target of thousands of studies and both phenotype and endotype target therapy. Smoking is one of the major contributors aggravating and it is accompanied by poorer asthma control, while exposure to environmental and passive smoking increases the risk of asthma exacerbations. High exposure to dust allergens and respiratory viruses is shown to be associated with poor allergic inflammatory pathways and non-allergic inflammatory pathways.[9] Long-term standing and continuous exposure to the mentioned triggers is directly and indirectly related to new diagnosis of asthma and poor control of asthma in the sometime will lead to continue severe asthma in a certain group of asthmatic patients and some of these triggers has the main role in the design of endotype of asthma and in the managing asthma.[10] The trigger identification could be used to avoid exposure or minimize it and educating the patients in prevention of asthmatic attacks and worsening of symptoms through avoidance of these triggers.[11] Educating asthmatic patients on triggers and the control strategy has been proved in some degree ,[12] might be adequate or could suboptimal educating,[13] however, it may be related to higher focusing on management by physician or it may be due to patients' perception on type of trigger.[14] A different and excellent result of asthma treatment depends upon compliance and adherence in different age groups and severity of categories and increasing awareness regarding the disease, preventing and treating modifiable risk factors, self-management ability, training skills, availability of medications and ability to adjust them. In Iraq, environmental risk factors, family history of asthma and exposure to cigarette smoking were detected as common risk factors of asthma.[3] Active smoking, occupation, dust, chemicals, fumes, gases, allergens, and non-steroidal anti-inflammatory agents are main triggers of Iraqi asthmatic patients.[15] However, there is a scarcity in national literatures identifying the triggers of asthma in Iraq and in Kurdistan region. This study aimed to determine the most common aggravating factor of asthma in Suleimani city and assessing the correlation of age groups and gender to specific aggravating factors.

Patients and methods

This study was an observational cross-sectional study implemented in the outpatient-clinics in Suleimani city-Kurdistan region/Iraq through four years duration within two periods; first period from 1st of April 2018 to December 2019 and the second period from April 2022 to the end of 2022, the reason was Covid -19 pandemic. The studied population was all asthmatic patients presented to the outpatient-clinics of SHAR hospital in Suleimani city. Inclusions criteria were patients age (≥14 years) diagnosed with asthma at the last 6 months before and more. Exclusion criteria were children, < 14 years, asthma diagnosis less than 6 months, suspect chronic obstructive pulmonary diseases (COPD), or other chronic pulmonary diseases than asthma and patients refused to participate in the study.

The study ethics were implemented regarding Helsinki Declaration by documented approval of Kurdistan Higher Council of Medical Specialties, agreement of health authorities in Suleimani city, oral informed consent, and management of any complications accordingly. A sample of one hundred and fifty (150) asthmatic patients were enrolled after eligibility to inclusion and exclusion criteria. Information of patients was collected directly from the patients or their relatives through a prepared questionnaire according to previous literatures.

It included general characteristics of the subjects (age, gender, occupation, family history of asthma, asthma duration and treatment) and aggravating factors (pollution, dust, iced drinks, cold weather, detergents, tobacco, perfume, exercise, viral infection, emotion, pets, plants, pregnancy, drugs, season of year, type of food, pollens, and vapor/fume).

The diagnosis of asthma was done or confirmed previously by their clinical evaluations, symptoms, history taking and spirometry. The triggers identification was done by perception of the selected patients through assessing worsening symptoms when they were in contact with the factor. The asthmatic patients' information was entered and interpreted statistically by SPSS program-26. Suitable statistical tests (Chi square and Fishers exact tests) for data were implemented accordingly and p value of ≤0.05 was significant. The ethical committee approved the study due to Helsinki Declaration.

Results

Female patients were more than males with female to male ratio of 1.8:1. The occupation of asthmatic patients was distributed as followings; housewife (50%), student (9.3%), public servant (16%), self- employed (16%), retired (5.3%) and unemployed (3.4%). The family history of asthma was positive in 36% in studied asthmatic patients. Mean asthma duration in studied patients was (11.8 years); 34% of them had duration of less than 5 years, 28% of them had duration of 5-10 years, 21.3% of them had duration of 11-20 years and 16.7% of them had duration of more than 20 years. Most of asthmatic patients were on treatment, while 16.7% of them were not on treatment.

The common aggravating factors of asthma as perceived by patients were pollution and dust, infection, tobacco, exertion, detergents, cold weather, perfume, food, emotion, iced drinks, vapor/fume, seasonal, plants, pollens, pets, and pregnancy (Table 1).

Table (1): Frequency of Aggravating factors of asthma.

Variable	Number	%
Pollution		
	121	80.7
Dusts		
	115	76.7
Iced drinks		
	81	54.0
Cold weather		
	96	64.0
Detergents		
	97	64.7
Tobacco		
	104	69.3
Perfume		
	94	62.7
Exercise		
	100	66.7
Viral infection		
	111	74.0
Emotion (stress, laughing, sadness)		
	85	56.7
Pets		
	40	26.7
Plants		
	52	34.7
Pregnancy		
	22	14.7
Drugs		
	40	26.7
Season of year		
	70	46.7
Type of food		
	92	61.3
Pollens		
	48	32.0
Vapor/fume		
	76	50.7
Total	150	100.0

No significant differences were observed between male asthmatic patients and female asthmatic patients regarding pollution, dusts, iced drinks, cold weather, detergents, perfume, viral infection, pets, plants, drugs, season of year, pollens and vapor/fume. The tobacco, exercise, emotion, pregnancy and type of food were significantly related to female asthmatic patients. (Table 2)

Table (2): Asthma aggravating factors according to gender of patients.

Variable	Gender of patients				p value
	Male		Female		
	No.	%	No.	%	
Pollution					0.74 NS
	42	34.7	79	65.3	
Dusts					0.79 NS
	40	34.8	75	65.2	
Iced drinks					0.83 NS
	28	34.6	53	65.4	
Cold weather					0.29 NS
	31	32.3	65	67.7	
Detergents					0.06 NS
	29	29.9	68	70.1	
Tobacco					0.03 S
	31	29.8	73	70.2	
Perfume					0.4 NS
	31	33.0	63	67.0	
Exercise					0.02 S
	29	29.0	71	71.0	
Viral infection					0.2 NS
	36	32.4	75	67.6	
Emotion (stress, laughing, sadness)					0.002 S
	21	24.7	64	75.3	
Pets					0.9 NS
	14	35.0	26	65.0	
Plants					0.6 NS
	17	32.7	35	67.3	
Pregnancy					0.005 S
	2	9.1	20	90.9	
Drugs					0.7 NS
	15	37.5	25	62.5	
Season of year					0.8 NS
	24	34.3	46	65.7	
Type of food					0.008 S
	25	27.2	67	72.8	
Pollens					0.7 NS

	18	37.5	30	62.5	
Vapor/fume					0.9 NS
	27	35.5	49	64.5	

S=Significant, NS=Not significant.

Discussion

In our study we have tried to find out the most aggravated factors of asthma in 150 subjects whose had been referred to our outpatient clinics at SHAR hospital, it is an epidemiological study for this reason we have not investigated for endotype triggers like serum eosinophilia and IgE level.

The triggers identification of asthma is essential in the designing preventive and treatment strategies of asthmatic patients despite patient's adherence and therapy recommendations. In our data collections we found that aggravating factors of asthma as perceived by patients were pollution, dusts, infection, and tobacco.

We have got through international literatures, and it was observed that our findings in Table 1(pollution 80,7% , dusts 76.6 % , infection 74 %, exercise and strong odors) and results in Table 2 mirrors the results of related exacerbated factors in literatures such as in an epidemiological study in Suleimani city, showed that (71%) of asthmatic patients were worse at night and on walking and just 58.0% of asthmatic patient were worse with viral infection like influenza. They had focus on other side of epidemiology of asthma16 and in same direction the study of Subbarao et al revealed dust or dusting , cold , flu , infection , smoking and strong odors the most self-reported asthma triggers,17 they mentioned animals, pets specially cats and dogs which are not a familial or common triggers until now in our and not a familial phenomenon inside low or middle class families and one of the reasons , may be the most trustable reason is religion and Gautier et al18 which all stated that common triggers of asthma are pollution, smoking, infection, and dusts, they showed that A significant difference were found between family history and participants, (31%) of cases had family history of asthma and in the sometime showed shows that (71%) of asthmatic patients were worse at night and on walking and just 58.0% of asthmatic patient were worse with viral infection like influenza, at the other side interesting issue in this study they mentioned that majority of asthmatic patients complained from anxiety and depression (97%, 96%) respectively then followed by 41% of them complained from food allergy, while those with gastro esophageal reflex, rhinitis and chronic rhinosinusitis formed just (25%, 23%, 21%).18.

A case-control study, 120 adult asthmatics, carried out in Iraq compared with 120 no asthmatic subjects found that common triggers of asthma were infection, smoking, dust, chemicals, and fumes, the percentage of cases have upper respiratory tract infection was 71.7%, and for controls were 32.5% with highly statistically significant, regarding active smoker this study shows that the percentage of the active smoker was 32.5% among cases .15 However, the discrepancy was observed between studies due to geographical and environmental differences. A study conducted in five European countries by Pirce et al14 showed that 52% of asthmatic patients exposed to 6-15 triggers mainly dust, infection, coughing, smoking, smoke, and pollution.

In current study, tobacco, exercise, emotion, pregnancy, and type of food were significantly related to female asthmatic patients ($p<0.05$). This finding is parallel to reports. studies and research over all the

asthma world like in Zein and Erzurum study which stated that gender differences in asthma incidence, prevalence, severity and triggering agents were common;19 they concluded with gender differences in asthma may also be related to behaviors of male and female asthmatics, their adherence to treatment guidelines and to medications and the response of their caregivers to male or female patient

Limitation

The study design and clinical application started before Covid-19 pandemic and there are certain limitations including both before and after the 2nd and 3rd waves of Covid-19 specially follow-up and select the patients, Covid-19 quarantine and isolation in which closing all outpatients and hospital normal functions which puts the study in ice for a while, The diagnosis and investigations become more and more difficult and took time and personal efforts to select the real and liable patients.

Conclusion

The common triggers of asthma in asthmatic patients in a 150-subject population in Suleimani city are pollution, dusts, infection, and tobacco. The triggers of asthma in patients are different regarding gender. Asthma triggers identification is an important and cornerstone in the prevention and treatment of asthma. National epidemiological studies inside this field are live important.

Acknowledgment

Gratitude and thanks for the staff of Shar hospital-respiratory outpatient.

Conflict of interest

None

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