



Scientific Research University of Baghdad Al-Kindy collage of medicine

The Prevalence of Allergic Rhinitis Among Medical Students

Research group:

Muna Abbas Fadhil

Halla Adb-alsahib Sultan

Fatima Saif Mudhafar

Yousif Ahmed Jabori

Moatasem Ahmed Mutasher

Supervised by:

Ass. Prof. Dr. Hussein Jassim

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
وَعَلَّمَكَ اللَّهُ الْكِتَابَ
وَكَانَ فَضْلُ اللَّهِ عَلَيْكَ عَظِيمًا

صَدَقَ اللَّهُ الْعَظِيمُ

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Abstract:

Background: Allergic rhinitis is an inflammatory disorder that affects the mucous membrane of the nose. The inflammatory effect is induced by allergen exposure, which triggers IgE-mediated inflammation. Allergic rhinitis is characterized by four major symptoms: rhinorrhea, sneezing, nasal itching, and nasal obstruction. It can be associated with other diseases, such as asthma and atopic dermatitis. It also represents a global health concern because it affects almost 400 million people around the world.

The aim of the study: is to determine the prevalence of allergic rhinitis and related factors among medical students in Baghdad.

Material and methods: cross-sectional study, conducted from October 2022 to March 2023 at Al-Kindy Medicine College in Baghdad, Iraq.

-These data cover the medical students of Al-Kindy College of Medicine.

-We used an online Google form to collect more samples.

-A convenient sample of 636 patients was included in this study.

Result: The total participants students were 636 . The prevalence of allergic rhinitis was(32.54%) (n=207), most of them 172(27.04%) with seasonal allergic rhinitis and the rest 35(5.5%) with perennial allergic rhinitis.

194(31.6%) of urban students had allergic rhinitis, In other hand the 13(56.5%) of rural students had allergic rhinitis.

Between females , 105 (30.17%) had allergic rhinitis, Between males , 102(35.41%) had allergic rhinitis.

The most common allergens that cause the allergy were dust (10.97%) and smoke (9.65%), while the least common allergen was heat (0.1%).

most common symptoms of allergy were runny nose (9.9%), sneezing (9.46%), while the least common symptom was inflamed itching (0.1%).

126 (91.3%) of Students who have family history, also have allergic rhinitis.

25 (92.59%) of students who are allergic to aspirin also have allergic rhinitis.

Students who have asthma were 46 (7.23%), 44 (95.65%) of them also have allergic rhinitis, and Students who have eczema were 29 (4.56%), 26 (89.65%) of them also have allergic rhinitis.

Conclusions: it is clear that allergic rhinitis is a significant health concern that requires attention and resources for effective management.

Introduction:

Allergic rhinitis is an important clinical type of allergic respiratory disease that shares many pathophysiological features and is a very common disorder that affects people of all ages, peaking in the teenage years. In which the immune system is misguided against foreign agents that should normally be harmless substances.⁽¹⁾ Genetic predisposition, exposure to allergens, nutritional conditions, existing perennial diseases, and acute viral infections are important etiological factors in these two allergies. However, environmental allergens are the most common operating factors in genetically predisposed individuals. In the past, allergic rhinitis was considered to be a disorder localized to the nose and nasal passages, but current evidence indicates that it may represent a component of a systemic airway disease involving the entire respiratory tract.

The allergic response is classified into early and late-phase reactions. In the early phase, allergic rhinitis is an immunoglobulin (Ig)-mediated response against inhaled allergens that cause inflammation driven by type 2 helper (Th2) cells.⁽²⁾ The initial response occurs within five to 15 minutes of exposure to an antigen, resulting in the degranulation of host mast cells. This releases a variety of pre-formed and newly synthesized mediators, including histamine, which is one of the primary mediators of allergic rhinitis. Histamine induces sneezing via the trigeminal nerve and also plays a role in rhinorrhea by stimulating mucous glands. Other immune mediators, such as leukotrienes and prostaglandins, are also implicated as they act on blood vessels to cause nasal congestion. Four to six hours after the initial response, an influx of cytokines, such as interleukins (IL)-4 and IL-13, from mast cells occurs, signifying the development of the late-phase response. These cytokines, in turn, facilitate the infiltration of eosinophils, T-lymphocytes, and basophils into the nasal mucosa and produce nasal edema with resultant congestion.⁽³⁾

The relationship between allergic rhinitis and aspirin allergy is complex and not yet fully understood. However, research suggests that there may be a link between the two conditions. In some cases, people with allergic rhinitis may also develop aspirin sensitivity, a condition known as aspirin-exacerbated respiratory disease (AERD). AERD is a perennial inflammatory condition that affects the airways and can lead to asthma-like symptoms.

The exact cause of AERD is not known, but it is believed to involve a complex interaction between the immune system, the respiratory tract, and aspirin.

Allergic rhinitis has been categorized as seasonal (occurs during a specific season) or perennial (occurs throughout the year). The seasonal type, called hay fever, is a type of inflammation in the nose that occurs when the immune system overreacts to allergens in the air.⁽⁴⁾ Signs and symptoms include a runny or stuffy nose, sneezing, red, itchy, and watery eyes, and swelling around the eyes.⁽⁵⁾ The fluid from the nose is usually clear. However, not all patients fit into this classification

scheme. For example, some allergic triggers, such as pollen, may be seasonal in cooler climates but perennial in warmer climates, and patients with multiple "seasonal" allergies may have symptoms throughout most of the year.⁽⁶⁾

Symptoms are classified as mild when patients have no impairment in sleep and are able to perform normal activities (including work or school). Symptoms are categorized as moderate or severe if they significantly affect sleep or activities of daily living and/or if they are considered bothersome. It is important to classify the severity and duration of symptoms, as this will guide the management approach for individual patients.⁽⁷⁾ Many people with allergic rhinitis also have asthma, allergic conjunctivitis, or atopic dermatitis.⁽⁸⁾

Seasonal allergic rhinitis ('hay fever') is a global health problem, and its prevalence has increased considerably in the last two decades. Treatment includes allergen avoidance, drugs such as antihistamine tablets and nasal sprays, and immunotherapy (vaccination). For those patients whose symptoms remain uncontrolled despite drug treatment, specific allergen immunotherapy (SIT) is advised.

Specific allergen immunotherapy is most commonly administered as subcutaneous (under the skin) injections by specialists requiring a building-up period followed by a maintenance period of three to five years. Immunotherapy may also be delivered by the oral, nasal or sublingual route .

Aim of the study:

The aim of the study is to determine the prevalence of allergic rhinitis and related factors among medical students in Baghdad

Material and methods:

Cross-sectional study, conducted from October/2022 to March/2023 at Al-Kindy Medicine College in Baghdad\Iraq.

-Study population:randomly selected medical students of Al-Kindy college of medicine from all different stages (1st to 6th stage) with a total sample size of 636, the females were 348 and the males were 288 .The age range of participants was(18-25)years.

-The questions were about Gender/Address/Type of Allergic rhinitis/Symptoms (runny nose, nasal obstruction) /If they had any related diseases (asthma, atopic dermatitis) /If they had allergic reaction to a certain substance /If their family suffer from Allergic rhinitis /If they take any medications for it /If they have any drug allergy.

-We ues a paper form and also an online Google form to collect more samples.

-The questionnaire was adopted from previous studies regarding the same disease.

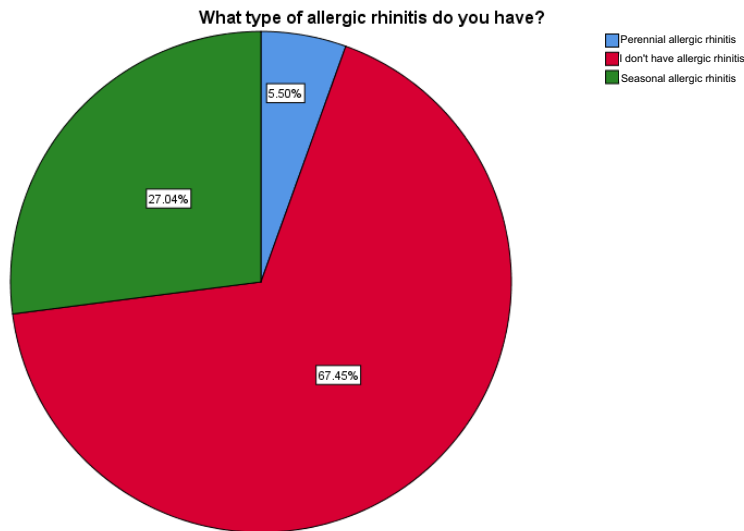
-The questions were revised by a supervisor & panel of experts in Al-Kindy college of medicine.

-A convenient sample of 636 patients was included in this study.

Results:

The total participants students were 636 , 348(54.7%) of them were females and 288(45.3%) were males. The prevalence of allergic rhinitis was 207(32.54%) , most of them 172(27.04%) with seasonal allergic rhinitis and the rest 35(5.5%) with perennial allergic rhinitis (Fig.1).

Fig.1: percentage of allergic rhinitis



The urban students were 613(96.38%) , 160(26%) of them with seasonal allergic rhinitis and 34(5.54%) with perennial allergic rhinitis , so the total number of students with allergic rhinitis was 194(31.6%) . In other hand the rural students were 23(3.6%) ,13(56.5%) of them had allergic rhinitis , 12(52%) with seasonal allergic rhinitis and 1(4.34%) with perennial allergic rhinitis.(Table.1)

Table.1

Count

		rural	urban	Total
What type of allergic rhinitis do you have?	perennial allergic rhinitis	1	34	35
	Seasonal allergic rhinitis	12	160	172
	I don't have allergic rhinitis	10	419	429
Total		23	613	636

Between females , 105 (30.17%) had allergic rhinitis , 87(25%) with seasonal allergic rhinitis and 18(5.17%) with perennial allergic rhinitis.

Between males , 102(35.41%) had allergic rhinitis , 85(29.51%) with seasonal allergic rhinitis and 17(5.9%) with perennial allergic rhinitis.(Table.2)

Table.2

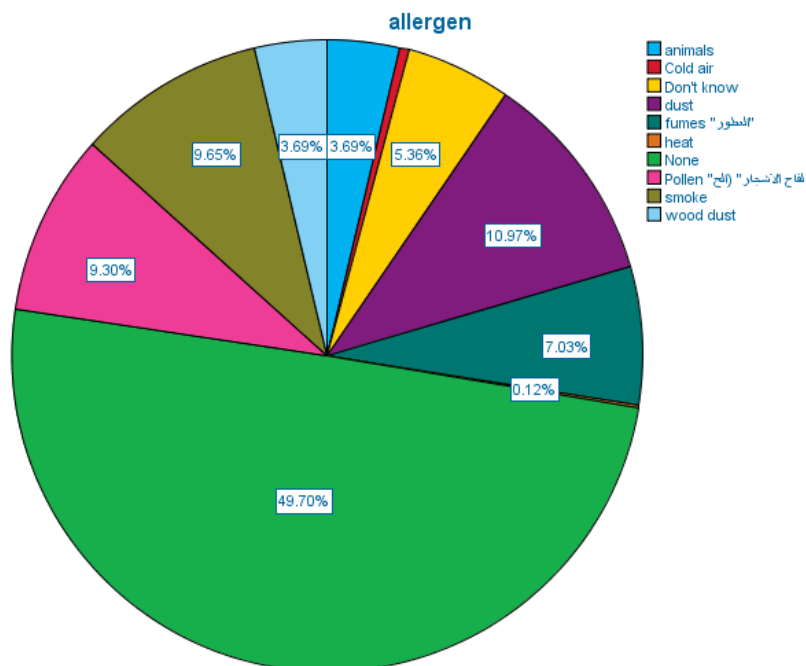
Gender * What type of allergic rhinitis do you have? Crosstabulation

Count

		What type of allergic rhinitis do you have?			Total
		perennial allergic rhinitis	Seasonal allergic rhinitis	I don't have allergic rhinitis	
Gender	Female ♀	18	87	243	348
	Male ♂	17	85	186	288
Total		35	172	429	636

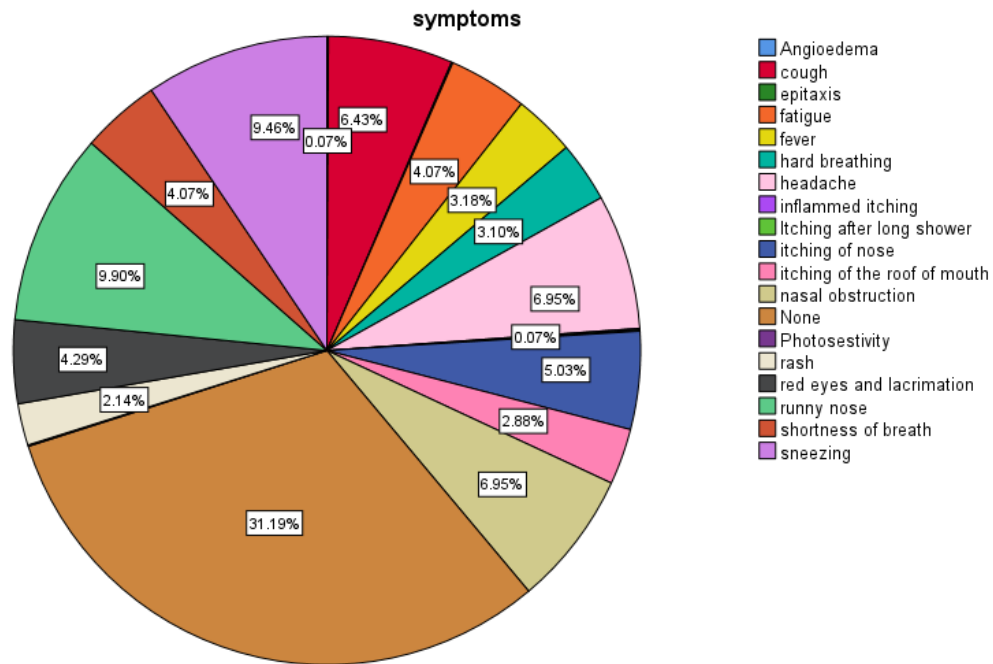
The most common allergens that cause the allergy were dust (10.97%),smoke (9.65%) and pollen(9.3%) ,while the least common allergen was heat(0.1%).
(Fig.2)

Fig.2: percentage of allergen



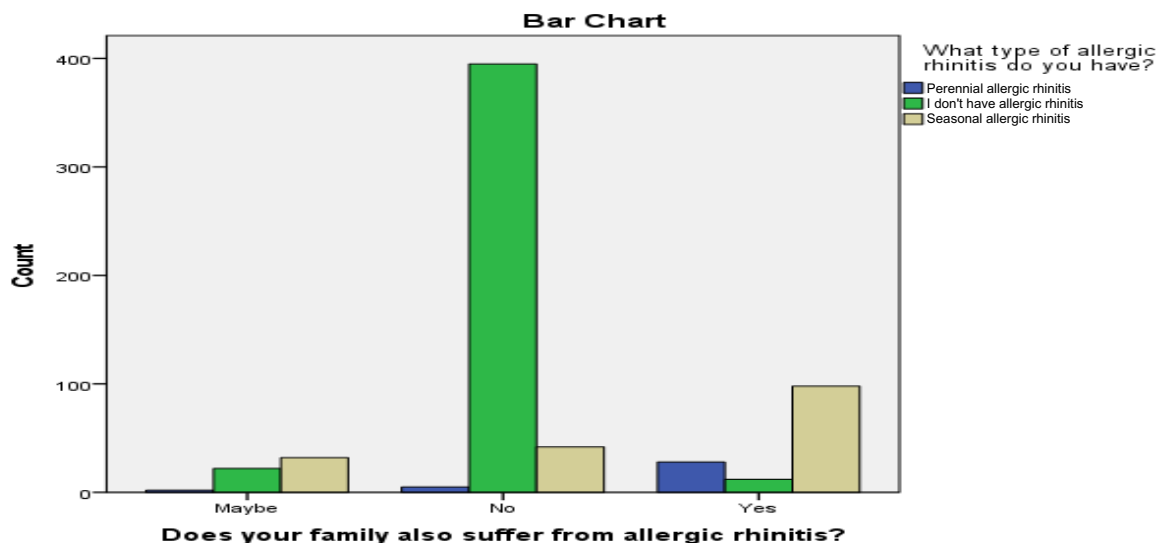
The most common symptoms of allergy were runny nose(9.9%) ,sneezing(9.46%) ,nasal obstruction(6.95%) and headache(6.95%) ,while the least common symptom was inflamed itching(0.1%).(Fig.3)

Fig.3: percentage of symptoms



Students who have family history of allergic rhinitis were 138(21.69%) , 126(91.3%) of them also have allergic rhinitis at the same time, 98(77.7%) with seasonal allergic rhinitis and 28(22.2%) with perennial allergic rhinitis.(Fig.4)

Fig.4:relationship between family history and allergic rhinitis



Students who are allergic to Aspirin were 27(4.24%), 25(92.59%) of them also have allergic rhinitis, 17(62.96%)with seasonal allergic rhinitis and 8(29.62%) with perennial allergic rhinitis.(Table.3)

Table.3

Are you allergic to Aspirin? * What type of allergic rhinitis do you have?

Crosstabulation

Count

		What type of allergic rhinitis do you have?			Total
		perennial allergic rhinitis	Seasonal allergic rhinitis	I don't have allergic rhinitis	
Are you allergic to Aspirin?	Don't know	8	42	12	62
	No	19	113	415	547
	Yes	8	17	2	27
Total		35	172	429	636

Students who have asthma were 46(7.23%), 44(95.65%) also have allergic rhinitis , 32(69.56%) with seasonal allergic rhinitis and 12(26.08%) with perennial allergic rhinitis.

Students who have eczema were 29(4.56%), 26(89.65%) also have allergic rhinitis , 20(68.96%) with seasonal allergic rhinitis and 6(20.68%) with perennial allergic rhinitis.

Students who have both asthma and eczema were 6(0.94%), 5(83.33%)of them also have allergic rhinitis. (Table.4)

Table.4

Do you have any of those diseases? * What type of allergic rhinitis do you have? Crosstabulation

Count

		What type of allergic rhinitis do you have?			Total
		perennial allergic rhinitis	Seasonal allergic rhinitis	I don't have allergic rhinitis	
Do you have any of those diseases?	Asthma	12	32	2	46
	both	1	4	1	6
	Eczema "atopic dermatitis" - الجلد حساسية	6	20	3	29
	none	16	116	423	555
Total		35	172	429	636

Discussion:

In our study the prevalence of allergic rhinitis was (32.54%)(Fig.1).Other study published in the Qatar Medical Journal in 2015, the prevalence of allergic rhinitis in Qatar was found to be around 25.6% among adults.

In relationship between urban students with allergic rhinitis ,we found a significant relationship that 31.6%were positive ,in rural areas, the relationship was also significant that 56.5% were positive (Table.1) .In a study conducted in ENT Department. Osmangazi University, Medical Faculty, Turkey,The prevalence of allergic rhinitis in urban and rural areas of Eskişehir-Turkey (May 2005) Prick test results was also found to be positive 61.8 % in urban areas and 46.7 % in rural areas, which was different of our results.

We found out that 35.41% of students who had allergic rhinitis were males, while only 30.17% were females(Table.2), according to a study by Cemal Cingi, Bulent Topuz, about the prevalence of allergic rhinitis among the adult population in Turkey 2010 ,22.3% of males and 23.8% of females had allergic rhinitis, so It was different of our results.

Although we found that most common allergen was dust (10.97%),smoke (9.65%), and pollen (9.3%) (Fig.2) , A study in china showed that there is significant correlation between pollen and allergic rhinitis (Yun. "Logistic regression analysis of risk factors affecting incidence and prognosis of allergic rhinitis." Chinese Journal of Otorhinolaryngology-Skull Base Surgery, vol. 23, no. 3, pp. 266-270, 2017;

The present study found that runny nose (9.9%) was the most common symptom of allergic rhinitis. In a study conducted by Mohammadi et al. in Tehran 2008, runny nose was also the most common symptom of allergic rhinitis,which was the same of our result.The Third most common symptom was nasal obstruction(6.95%) (Fig.3) . Nevertheless, Shariat et al.2012 reported nasal obstruction to be the most common symptom of the disease and found a significant relationship between nasal obstruction and allergic rhinitis.

The prevalence of students who have allergic rhinitis from those who have a family history of allergic rhinitis was significant (91.3%)(Fig.4). A study done in Delhi (India) showed that people who have a family history of allergic disorders and clinical allergy has 80% probability of suffering from allergic rhinitis.

In comparison between students with allergic rhinitis and students who haven't allergic rhinitis, we found that there is a significant relationship between allergic rhinitis and allergic to aspirin that is 92.5% of students who are allergic to aspirin also have allergic rhinitis (Table.3). While the exact cause of the relationship is not yet fully understood, researches suggest that people with allergic rhinitis may be more susceptible to aspirin sensitivity.

We found out that there is a remarkable relationship between Asthma & Allergic rhinitis, 33.3% of student with Allergic rhinitis had Asthma also, according to a study conducted in Spain 2021 by Acevedo-Prado, 28.4% of patients with Allergic rhinitis also had Asthma.

The same goes for Eczema, it has a significant relationship with Allergic rhinitis, 19.6% people with Allergic rhinitis had eczema (Table.4), according to a study conducted in University of Zurich in Switzerland 2007-2015, 21% of patients with Allergic rhinitis also had Eczema.

Conclusions:

It is clear that allergic rhinitis is a significant health concern that requires attention and resources for effective management. The prevalence is high because :

- 1.Environmental factors: In Iraq, factors such as desert dust, air pollution, and exposure to plant pollen may contribute to the prevalence of allergic rhinitis.
- 2.Genetics:A family history of allergies can increase the likelihood of developing allergic rhinitis.
- 3.Lifestyle factors: Certain lifestyle factors such as smoking, stress, and a diet high in processed foods can weaken the immune system and increase the risk of developing allergies.

Recommendation:

- 1.Identify and avoid allergens
- 2.Use medications: that can help relieve the symptoms of allergic rhinitis, including antihistamines, decongestants, nasal corticosteroids.
- 3.Practice good hygiene: Good hygiene can help reduce your exposure to allergens.
- 4.Consult with a doctor: If your symptoms are severe or persistent, it is important to consult with a doctor. They can perform tests to determine the cause of your symptoms and recommend the most appropriate treatment.

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