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Allergic rhinitis symptoms, causes and treatment among medical students in Basra city

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قال تعالى

" يَرْفَعِ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ ۚ وَاللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ "

(المجادلة: 11).

contents

Abstract

Background: Allergic Rhinitis (AR) is an inflammatory upper respiratory disorder with an increasing global health concern that impacts life quality, school, work attendance, and performance. The management of AR represents collaboration between pharmacists, physicians, other health care professionals, and patients.
The aim of the present investigation is to study the symptoms of allergic rhinitis in Iraqi medical students and the main allergens and treatment schedules.

Methods: In order to address the most prevalent symptoms, triggers, and AR-related medications, a questionnaire form was created. Additionally, data from the Basrah Allergy Center regarding the majority of allergens. A web-based structured questionnaire was used to collect both qualitative and quantitative data for the study.

Results: A total number of 452 patients of both genders with AR have participated in this study. In 359 patients the most common inconvenient symptoms in AR patients was 72% sneezing which Its worth mentioning that severity of these symptoms in female more than male, 82% was allergic to dust, 60% used loratadine as a treatment, 78% of the observed patients preferred tablet as dosage form and 60% of both male and female used vitamin C as adjuvant.

Conclusion Based on the results obtained in this study, it has been determined that medical students frequently experience allergic rhinitis with a slightly higher incidence among females. Diagnosing allergic rhinitis and treating it, which involves avoiding allergens were improving the quality of life for the patients.

Keywords: Allergic rhinitis, Immunoglobulin E, Allergy, Antihistamine, Causes

Introduction

Allergic rhinitis (AR) is an atopic disease characterized by symptoms of nasal congestion, clear rhinorrhea, sneezing, postnasal drip, and nasal pruritis. It affects one in six individuals and is associated with significant morbidity, loss of productivity, and healthcare costs. Historically, AR was thought to be a disease process of the nasal airway alone. Still, the development of the unified airway theory has classified AR as a component of systemic allergic response, with other associated conditions, such as asthma and atopic dermatitis, sharing an underlying systemic pathology[1].

AR is caused by immunoglobulin E (IgE)-mediated reactions to inhaled allergens and is one of the most common chronic conditions globally [2]. Allergic rhinitis can be easily spotted when a person has a few quick sneezes in succession (due to an exposure to an allergen) with watery, itchy red eyes and an itchy nose and throat.

Well-recognized risk factors for allergic rhinitis include having atopy, asthma, eczema and other allergic diseases [3-4]. Parental history of allergic disease is also a well-documented risk factor. The risk of allergic rhinitis increases in children of parents with allergic rhinitis, asthma, hay fever and pollen allergies [5 – 6]. According to a recent Swedish study, children born to parents who have an allergic disease have 1.8 to 8.8 times higher odds of acquiring allergic rhinitis than children without an allergic disease [7]. Children born to parents who have both hay fever and a pollen allergy had the highest risks of having allergic rhinitis.

Factors that may contribute to disease risk but are not well understood include vitamin D, obesity, exposure to cigarette smoke, increased total serum IgE, increased blood eosinophils and other environmental

exposures common in urban settings [8-9]. While vitamin D has a modulatory role in both innate and adaptive immune systems [10], current evidence of an association with allergic diseases remains conflicting [11, 12].

The diagnosis is based on the clinical history and if needed in patients with uncontrolled rhinitis despite medications or with long-lasting symptoms : Immediate hypersensitivity testing (allergy skin tests) An in vivo method of determining immediate (IgE-mediated) hypersensitivity to specific allergens skin test or the presence of serum-specific IgE antibodies to allergens. The fluorescent enzyme immunoassay (FEIA) indirectly measures the quantity of IgE acting as an antibody to a particular antigen. While Total serum IgE values are not sensitive or specific for allergic rhinitis, although in some circumstances, they may be useful when paired with other criteria. The total blood eosinophil count, like total serum IgE, is not always helpful in making a diagnosis but can be when paired with other factors.

Treatment and management are keys to achieving a good quality of life with allergies. The management of allergic rhinitis consists of the following 3 major treatment strategies:

- Environmental control measures and allergen avoidance: These include keeping exposure to allergens such as pollen, dust mites, and mold to a minimum
- Pharmacologic management: Patients are often successfully treated with oral antihistamines, decongestants, or both; regular use of an intranasal steroid spray may be more appropriate for patients with chronic symptoms
- Immunotherapy: This treatment may be considered more strongly with severe disease, poor response to other management options, and the presence of comorbid conditions or complications; immunotherapy is often combined with pharmacotherapy and environmental control[13].

The aim of the study is to investigate the symptoms of allergic rhinitis among Iraqi medical students and the main allergens and treatment schedules

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Method

2.1. Study Design

This population-based cross-sectional study was carried out to investigate the medical students in Iraq for their allergic rhinitis symptoms, causes, triggers and medications they used from 7 December to 26 December 2022 . This study was conducted by using both qualitative and quantitative data in which a web based structured questionnaire was used.

2.2. Participants and Eligibility Criteria

A screening questionnaire form was designed for this purpose depending on the previous studies. This study included only those respondents who were easily available for data collection and interested to provide information. Those who did not feel comfortable to give information were excluded from the study. Additionally, a select group of patients who took part in the study were chosen at random from the Basrah allergy and asthma center's patients, and their case histories and laboratory test results were immediately reported.

2. 3. **Data collection, Sampling and recruitment**

A total number of 452 patients were included in this investigation in which a 359 patients from our website questionnaire. This questionnaire consisting of close-ended and open-ended questions was shared to be completed by all the respondents. It was distributed online among telegram groups and other social media. Answers from these questionnaires were exclusively used as the data source in this study. This questionnaire was made in Arabic language, and it involved information like allergic rhinitis symptoms, triggers, herbal used, medications and their dosage form.
The remaining 93 patients are from the Basrah allergic and asthma clinic, and we obtained their information directly. The IgE test made by the Polycheck® screening assay kit (a brand of biocheck, made in Germany) , to test for allergies as well as autoimmune disorders.

2.4.**Data analysis**
The data collected by using Statistical analysis by using descriptive T-test and Microsoft Excel programs for Microsoft Windows and the results were represented in tables and diagrams.

Results

3.1.Demographic data

A total of 359 volunteers participated in the study; 294 were female (mean 21.94±2.39years) and 65 were male (mean 23.68±3.78 years) , According to the results showed at both table (1) and figure(1) , there was no significant differences in age between male and female , also there was same statistical results according to the institute that the volunteers were in.

Patients Data		
	Male	**Female**
Age	23.68±3.78	**21.94±2.39**
Patient number	65	**294**
Institute		
Institute	M %	F %
Medical Institute	16.92308	6.122449
Dept. of pathological analysis	7.692308	18.36735
college of pharmacy	47.69231	52.04082
College of Medicine	12.30769	15.30612
College of Nursing	15.38462	5.102041
College of Dentistry	0	2.721088

Table 1. Details of participated patient

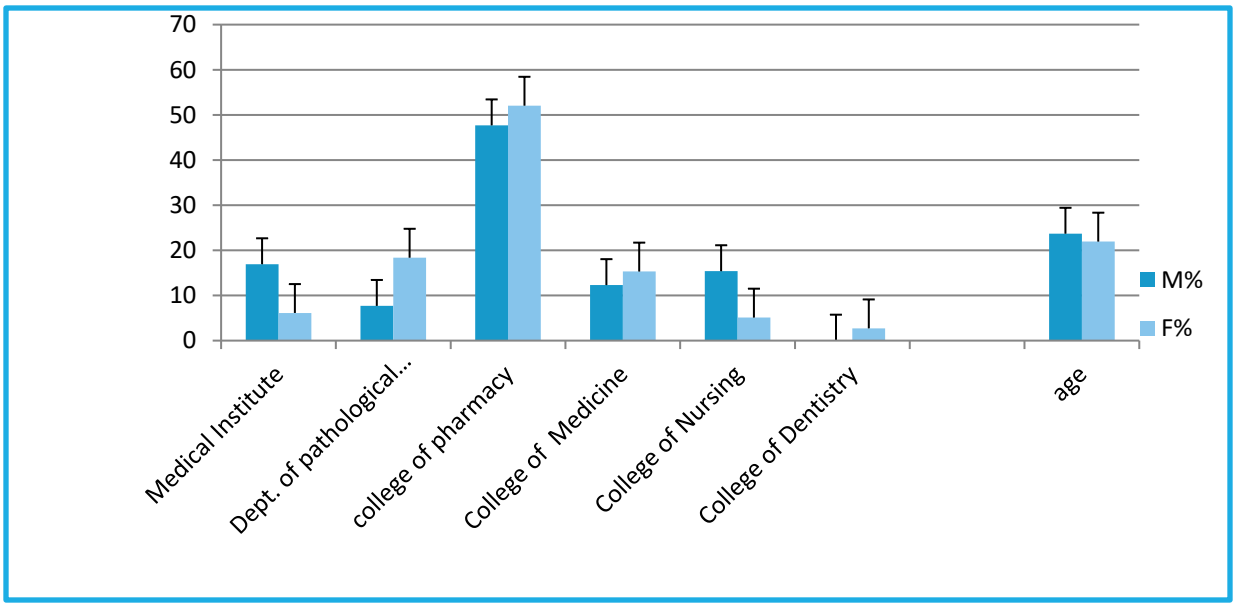

Figure 1. Details of participated patient.

2.2. Allergic rhinitis signs and symptoms

The observations on the table (2) and figure (2) revealed only significant increasing in lacrimation, headache and itching in female group than in male. All other clinical signs were statistically similar at both genders. When study the common allergens, Dust is the most common allergen in both male and female. All allergens are similar in female and male except detergents which highly significant in female group

	Clinical signs			Allergens	
	M	F		M	F
Rhinorrhea	52.30	65.30	Dust	81.538	82.65
Sneezing	64.61	74.48	Perfumes	44.61	43.87
Lacrimation	32.30	50.68*	Detergents	36.92	56.12*
Headache	33.84	47.95*	Smoking	40	44.89
Itching	43.07	71.35*	Animal dander	18.46	16.66
Chest tightness	15.38	20.40	Humidity	24.61	25.85
Nasal obstruction	58.46	62.24	Others	9.23	11.90
Others	7.692	14.59			

Table 2. Most common allergens and allergic rhinitis signs & symptoms in patients

*Significant differences between females and males

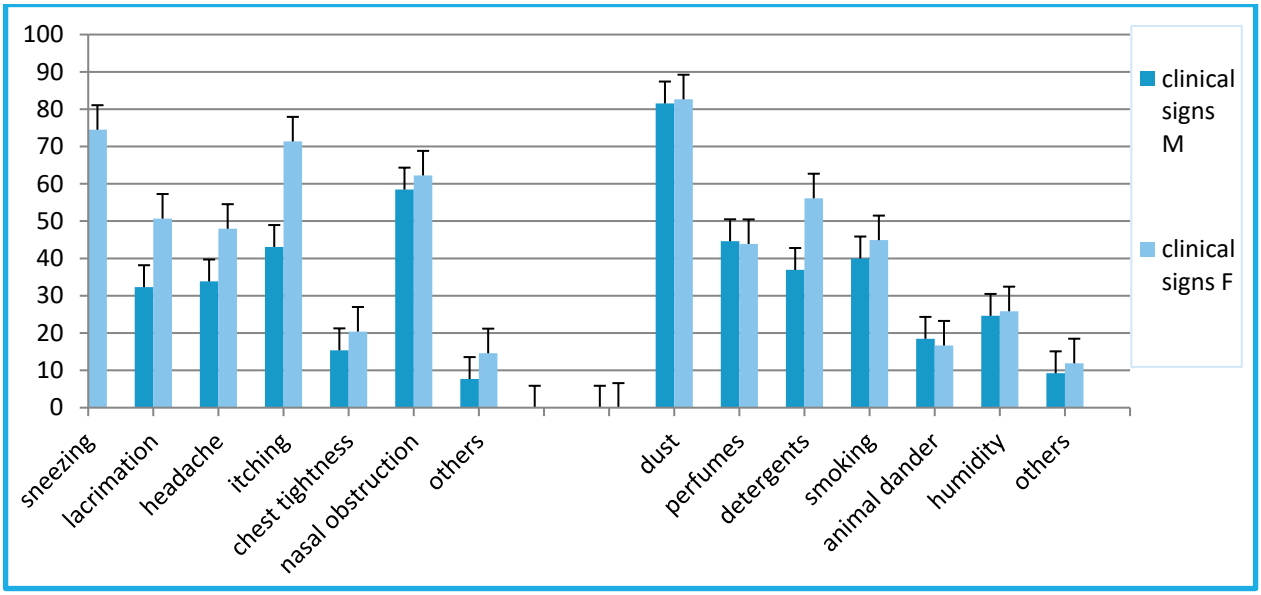

Figure 2: The prevalence of allergic rhinitis sign & symptoms in patients and the most common triggers of allergic rhinitis.

2.3. Allergic rhinitis drugs

The study also includes the drugs that commonly used in acute attack of allergy, Loratadine was the most common drug used in both male and female group. At female group; Loratadine and Actifed were significantly used than in male group. While in male group; Cetirizine and pseudoephedrine were used more than in female.

The common adjuvant treatments were the same in both groups, vitamin C was the most common adjuvant treatment used in both male and female group. The data were illustrated by Table (3) and Figure(3).

Drug	F	M	Adjuvant	F	M
Loratadine	60.54*	46.15	omega 3	8.16	7.69
Otrivin	25.51	26.15	vitamin c	30.95	30.76
Cetirizine	13.26	21.53*	green tea	5.78	4.61
Pseudoephedrine	12.97	20*	ginger	4.76	6.15
Hayanil	14.96	18.46	yogurt	5.10	10.76
Actifed	37.41*	18.46	others	29.25*	18.46
Azelastine	3.74	3.07			
Beclomethasone	7.82	6.15			
Chlorpheniramine	17.34	20			
Montelukast	14.28	15.38			

Table3: Drugs and adjuvant treatments used by Allergic rhinitis patients.

*Significant differences between females and males

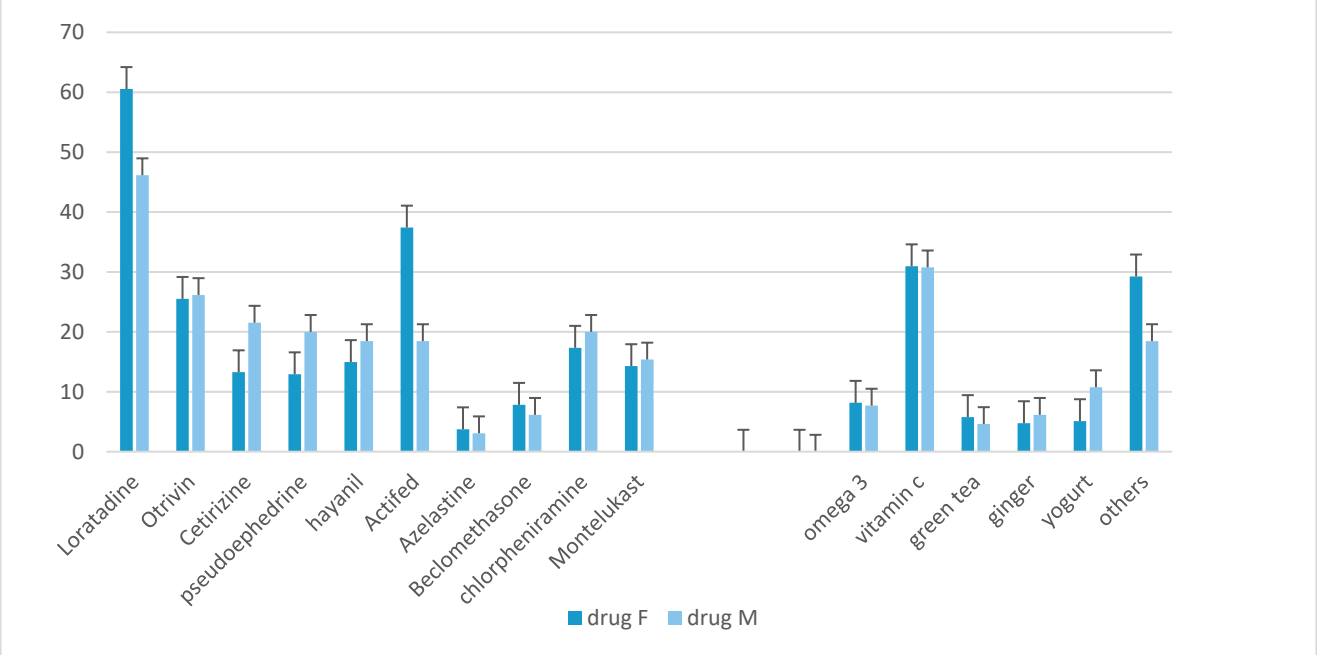

Figure 3. The most common drugs and adjuvant treatments used to treatment the Allergic rhinitis patients.

The dosage forms of drugs were showed no significant differences between male and female included at the present study. Data reflects that patients were more preferred tablets rather than other dosage forms.

Dosage form		
	M	F
Tablet	78.46154	78.23129
Capsule	24.61538	19.72789
Drops	26.15385	22.78912
Spray	33.84615	26.87075
Others	6.153846	10.54422

Table 4. Dosage form of the used allergic rhinitis drugs

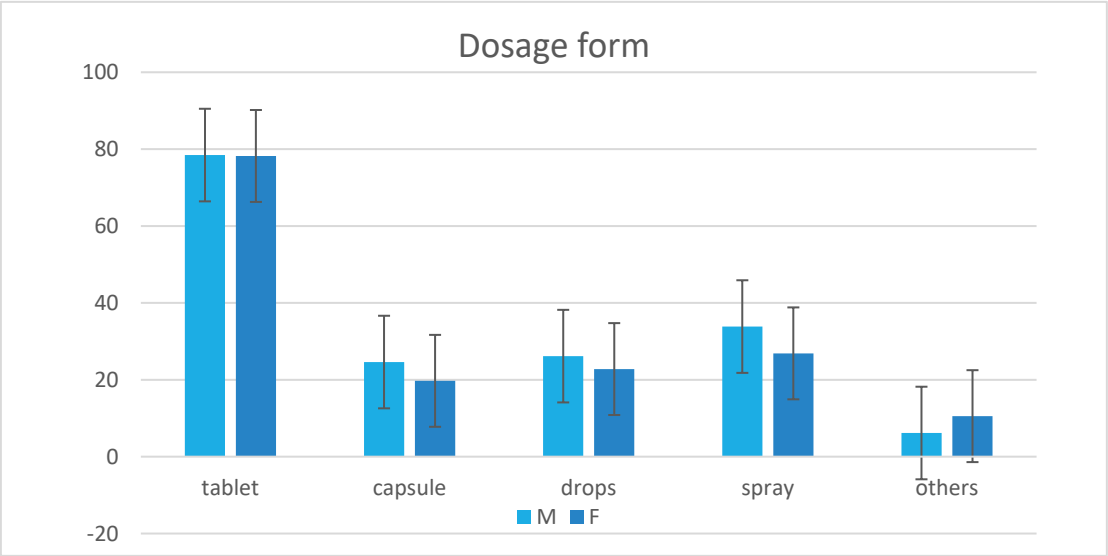

Figure4: Dosage form of the used allergic rhinitis drugs.

2.4. IgE test sample

The allergic tests that done at the allergic and asthma center in Basrah, about 93 patients participated in this study, 51 were male and 42 were females. The results showed that only (d01/d02) test was more in male than in female group, while female group the tests; g02, w10, e01/e02/e05, m05 and ix267 were statistically common positive more than male group. Other tests were statically similar at both groups.

Allergic test		M	F
Bermuda grass pollen	g02	15.09434	21.95122*
Rey pollen	g12	0	0
6-grass mix	gx7	13.20755	9.756098
Mugwort pollen	w06	0	0
Goosefoot pollen	w10	11.32075	19.5122*
Russian thistle pollen	w11	11.32075	4.878049
Cat/dog epithelia	e01/e02/e05	15.09434	24.39024*
Cladosporium herbarum /alternaria tenu	**m02/m06**	**1.886792**	**4.878049**
Candida albicansis	m05	1.886792	24.39024*
D-farinae/D-pteronyssinus	d01/d02	32.07547*	24.39024
Blomai tropicalis	d201	9.433962	4.878049
Cockroach mix	ix267	18.86792	46.01933*

Table5: Results of allergen specific IgE screening assay

*Significant differences between females and males

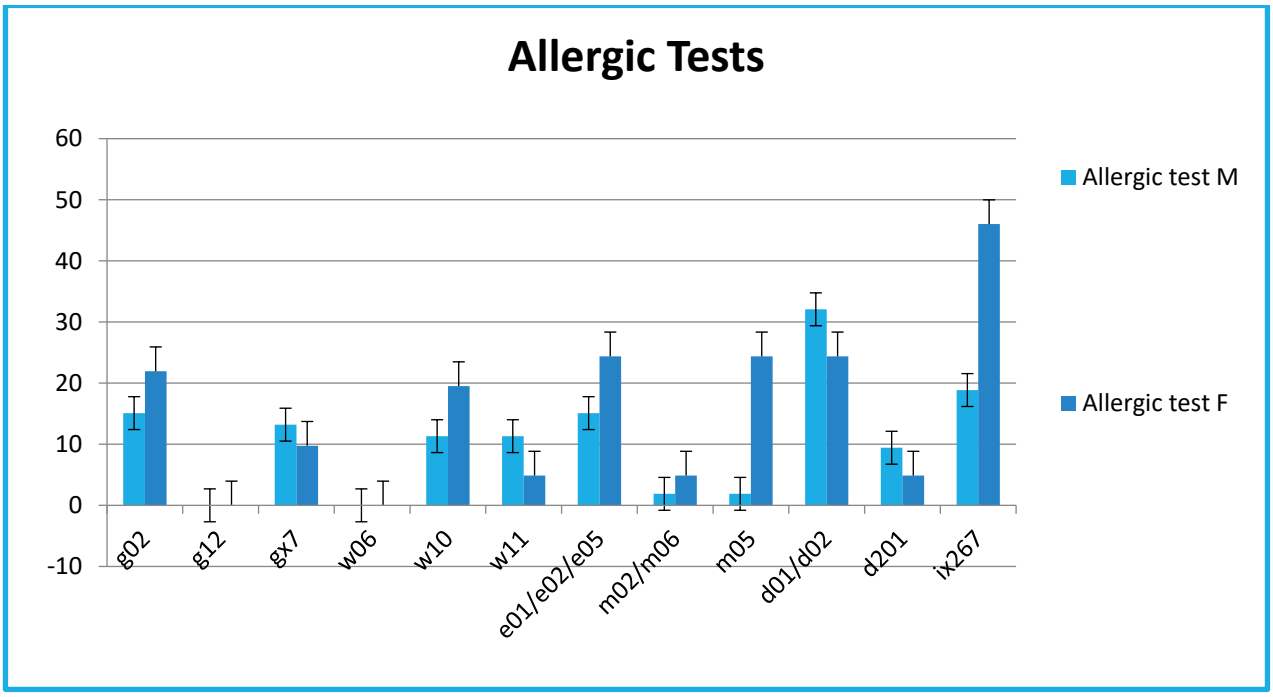

Figure5: results of allergen specific IgE test for the allergic rhinitis patients

Discussion

AR patients can go through a variety of troublesome clinical symptoms which are mostly insufficiently acknowledged and underreported resulting in a delay in medical management and ultimately a decrease in the patient health related life quality . Medical attention of AR should be individualized and based on the spectrum, duration, and severity of symptoms, physical examination findings, comorbidities, the age of the patients, and patient preferences.

In this study, various factors were taken into account that could benefit AR patients' therapy and quality of life. At least 72% of AR patients reported sneezing, 63% reported rhinorrhea, 61% reported nasal obstruction, 47% reported lacrimation, 46% reported itching, 45% reported headaches, and 19% reported chest tightness as their most bothersome symptoms. It's worth mentioning that severity of these symptoms in female more than male. A previous study, undertaken in the Middle East region which included five countries (Egypt, Iran, Lebanon, Saudi Arabia, and the United Arab Emirates) reported that these bothersome signs were one of the most common symptoms of AR [14].

The mediators that are immediately released include histamine, tryptase, chymase, kinins, and heparin. [15,16] The mast cells quickly synthesize other mediators, including leukotrienes and prostaglandin D2. These mediators, via various interactions, ultimately lead to the symptoms. The identification of the most common symptoms, the impact of AR on the population, and highlighting the treatment gaps will provide better understanding and treatment of AR, leading to improvements in the overall patient’s management and life quality [17].

Furthermore, the data shows that at least 82% of patients developed allergic reactions after exposure to dust; this was expected due to the climate changes of Iraq which is known for its increasing incidence of sandstorms which is shown in Table2. Dust was a trigger factor for AR in other countries that have a comparable climate like, Saudi Arabia and UAE which presented with at least 74% and 59% respectively, of patients allergic to dust [18].

An earlier study reported that desert regions are found in south and north of Iraq, with a fertile lower Mesopotamian plain supported by both the Tigris and Euphrates rivers. Yearly, dust and sandstorms occur and reaches their peak from May to October [19]. Additionally, the allergen-specific IgE testing revealed that between 15% and 28% of the patients in the study exhibit sensitivity to various pollen types (Table 5 and Figure 5). In the Iraqi capital Baghdad, a previous study that involved pollen and mold surveys found periodic maxima of penicillium, alternaria, aspergillus, and hormodendrum. After being tested with a number of seasonal aeroallergens, numerous people reported positive skin tests with grass, weed, and tree pollens[20].

Because the majority of patients who participated in the current study were women who frequently use these products, 44% of those who were tested had allergies to perfumes and makeup. Additionally, at least 44% of the patients had cigarette smoke allergies, and 17% of patients had animal dander allergies(Table 2). Such a decline may be attributed to social restrictions or an unsuitable environment that make it difficult to care for or rear pets, but in the near future, there is a strong likelihood that the number of people who are allergic to animal dander will rise as more and more age groups in society express a desire for particular breeds of animals. Other nations like Iran and the UAE, which recorded 18% and 4% of allergic patients to animals, respectively, in 2021 [17], also reported this comparatively low number.

Additionally, the current study showed that more than half of the patients used the drug loratadine for relieve of AR symptoms and this may related to cost (it's cheap) or it's efficient to relieve symptom and less side effect. Loratadine is a non-sedating, second-generation antihistamine. When used frequently or as a prophylactically measure during the peak of an allergic reaction's symptoms, the second-generation oral antihistamines have been shown to effectively reduce rhinorrhea, itching, and sneezing[21]. The first-generation sedating antihistamines, diphenhydramine and chlorpheniramine, were used in a lesser percentage, 17% and 18%, respectively by the studied patients than the second generation oral antihistamines. Although the older first generation antihistamines are also effective in reducing the symptoms of AR, they have been shown to exert a negative effect on the functioning and cognition of the patients due to their somnolence effect. Therefore, they are not routinely recommended for AR treatment. In addition to the second generation antihistamines, intranasal steroids are also considered as first-line therapy for patients with more severe AR symptoms [22,23].

According to (Figure 4 and Table 4) , 27% of patients prefer spray dosage forms exclusively, while 73% of patients prefer tablets, 8% prefer both tablets and spray. The oral tablet dosage form is less expensive than other forms of medication and easier to administer by oneself while maintaining dose accuracy [18].

As a result, it was found that identifying the undesirable symptoms was crucial to the management of AR, and highlighting the most common symptoms will undoubtedly help in the choice of the appropriate to be employed. Such information drugs may help in the creation of individualized regimens for people with AR, subject to further trials.

Conclusion

It has been concluded that allergic rhinitis is prevalent among medical students with relatively higher shift towards females. Recognition and management of allergic rhinitis, which includes allergen avoidance, Immunotherapy, and pharmacological treatment, can prevent serious complications, and significantly improve the patient's quality of life

Recommendations

We recommend further large scale studies for identifying most environmental pollutions that may cause allergy in Iraq .

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