



EPIDEMIOLOGY AND CLINICAL SIGNS AND SYMPTOMS OF ALLERGIC RHINITIS WITH IMPACT ON PATIENT LIFE: RESULTS OF ACROSS SECTIONAL STUDY IN IN PRINCESS HAYA MILITARY HOSPITAL

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1. ABSTRACT

Background: Allergic rhinitis is one of the commonest chronic disorder worldwide, it is characterized by sneezing, nasal itching, runny or congested nose, and itching or swelling of the eyes. Management of allergic rhinitis divided into three main categories, allergen avoidance, medical therapy, and immunotherapy. Due to its chronicity and prolonged nature allergic rhinitis can dramatically affect patient's quality of life. **Objective:** This research is conducted to provide preventive and control measures to be used to limit the effect of allergic rhinitis. And also to evaluate and assess the impact of allergic rhinitis on quality of life. **Methods:** Prospective prevalence study was conducted; survey had be full filled by a team of two ENT specialist doctors, two public health doctors and one medicine doctor and nurse. The sample size was 103 patients, who visited ENT clinic in Princes Haya Military Hospital. Socio-demographics, symptoms, signs, preventive measures, and impact of allergic rhinitis were studied. Analysis was done by SPSS 21 program. **Results:** Patients with allergic rhinitis was mostly seen in the age category between (20-39y), they showed the highest percent of visitors to the outpatient clinic with a (63.1%) of visitors. Second most common age category was between (40-59y) which showed (25.2%) of the outpatient clinic visitors. When we speak about gender, it was noticed that allergic rhinitis was mostly seen in males it was (61.2%). In addition, those who had barns showed a (8.7%) ability to have allergic rhinitis. Cigarette smoking showed high percent to have allergic rhinitis which was (55.3%). Cold temperatures, windy weather, perfume, and humidity also showed high percent to have allergic rhinitis which was (86.4%, 74.8%, 53.4%, 52.4%) respectively. Most common used drugs to modify the impact of allergic rhinitis on life will be studied. It was noticed that the most common medication used was and effective was antihistamines with nasal steroids which was (68.9%). Second most common medication used to treat allergic rhinitis was antihistamine alone. (7.8%) of patients did not need to use any medication. **Conclusion:** Allergic rhinitis is a preventable disease, medications modifies allergic rhinitis especially anti-histamines & steroids. Smoking, environmental elements, and many other variables may be controlled.

KEYWORDS: Allergic rhinitis, Epidemiology, ENT, Risk factors, Quality of life.

2. INTRODUCTION

Rhinitis is as inflammation of the nasal mucosa. Allergic rhinitis is the most common type of rhinitis which defined as a heterogeneous allergic reaction that causes classic symptoms of nasal congestion, nasal itch, rhinorrhea, sneezing airflow obstruction and sore throat.

Allergic rhinitis is the most common type of allergy affecting 10 to 20% of the population, the prevalence of allergic rhinitis range from 9% to 42% worldwide.^[1]

It found that prevalence of allergic rhinitis increased over the years due to urbanization and environmental

pollutants that causes the disease. It is most common between the ages of twenty and forty.^[2]

The pathogenesis and the development of allergic rhinitis is typically be affected by both genetic and environmental factors. Environmental exposures such as air pollution, tobacco smoking, pollen, pet hair, dust, or mold can increase an individual's chances of developing allergies. Allergic rhinitis is associated with production of immunoglobulin type I IgE -mediated immune response toward allergens. The underlying mechanism involves Type I hypersensitivity mediated by IgE antibodies that attach to an allergen, and subsequently

result in the release of inflammatory chemicals such as histamine from cells.

Type I hypersensitivity reactions occur in 2 different phase according to time sequence. The early phase usually within 20 min after allergen exposure in response of activation of mast and inflammatory cells induce nasal manifestation (sneezing and rhinorrhea) by secreting chemical mediators such as histamine, prostaglandins and leukotrienes.^[3]

The other phase is the late inflammatory reaction, After 4–6 h of allergens exposure which shows nasal obstruction and, nasal mucosal inflammation due to variety of inflammatory cells such as T cells, eosinophils, basophils, neutrophils, and monocytes into the nasal mucosa.^[4]

Allergic rhinitis is triggered by allergen or irritants. Allergens are subdivide into outdoor (such as pollens from trees, grass and mold spores) and Indoor allergens (such as pet, hair, dust mites, and mold). Irritants, such as cigarette smoke, perfume.

The classical symptoms of allergic rhinitis are: rhinorrhea, itching, sneezing fits, and nasal congestion and obstruction and sneezing. Other characteristic physical findings include allergic conjunctivitis, behavioral signs (nose wipe or rub), decreased

concentration and focus limited activities, decreased decision-making capacity, irritability sleep disorders and fatigue.

The treatment goal for allergic rhinitis is to prevent or relief of symptoms. Therapeutic Measures to achieve this goal include avoiding the allergen, oral antihistamines, intranasal corticosteroids, leukotriene receptor antagonists, and allergen immunotherapy.

3. METHODOLOGY AND MATERIALS

A prospective descriptive prevalence study, was conducted in Princess Haya Military Hospital in Ajlon. On a sample of (103) patients complaining of allergic rhinitis to study the impact of allergic rhinitis on life. Data was collected by answering a questioner which discussed multiple variables (socio-demographic, risk factors, medication, and complications). Each patient was interviewed through a designated team which was formed of (2 ENT specialist, 2 Public health specialist, 1medicine doctor and nurse). Each patient of the (103) patient was interviewed and evaluated by the ENT specialist. Data was analyzed by SPSS 21 program.

4. FINDING

Table (1): Allergic rhinitis socio-demographic.

Variable	No. Of cases	% of cases
Age		
<20	5	4.9
20-39	65	63.1
40-59	26	25.2
=>60	7	6.8
Sex		
male	63	61.2
female	40	38.8
Smoking		
Yes	43	41.7
No	60	58.3
Education		
illiterate	1	1.0
educated	102	99.0
Barns		
Yes	9	8.7
No	94	91.3

Table 1 discusses the socio- demographic variable of allergic rhinitis. Patients with allergic rhinitis was mostly seen in the age category between (20-39y), they showed the highest percent of visitors to the outpatient clinic with a (63.1%) of visitors. Second most common age category was between (40-59y) which showed (25.2%) of the outpatient clinic visitors. When we speak about gender it was noticed that allergic rhinitis was mostly

seen in males it was (61.2%). And those who had barns showed a (8.7%) ability to have allergic rhinitis.

Table (2): Allergic rhinitis risk factors.

variable	No. Of cases	% of cases
Cigarette smoking		
Yes	57	55.3
No	46	44.7
Chemical		
Yes	18	17.5
No	85	82.5
Cold temperature		
Yes	89	86.4
No	14	13.6
Humidity		
Yes	54	52.4
No	49	47.6
Wind		
Yes	77	74.8
No	26	25.2
Air pollution		
Yes	20	19.4
No	83	80.6
Hair spray		
Yes	17	16.5
No	86	83.5
Perfume		
Yes	55	53.4
No	48	46.6
Wood smoke		
Yes	22	21.4
No	81	78.6
Colognes		
Yes	9	8.7
No	94	91.3
Fumes		
Yes	11	10.7
No	92	89.3

Table 2 show risk factors of allergic rhinitis. In this table most common risk factors will be analyzed. Cigarette smoking showed high percent to have allergic Rhinitis which was (55.3%), cold temperatures, windy weather,

perfume, and humidity also showed high percent to have allergic rhinitis which was (86.4%, 74.8%, 53.4%, 52.4%) respectively.

Table (3): Most common used drugs to modify the Impact of allergic rhinitis on Life.

Variable	No. Of cases	% of cases
antihistamin+eyes drop	2	1.9
other combination	3	2.9
antihistamines+eyes drops+nasal steroids	6	5.8
no medication	8	7.8
antihistamines alone	13	12.6
antihistamines+nasal steroids	71	68.9

In table 3; most common used drugs to modify the Impact of allergic rhinitis on life will be studied. It was noticed that the most common medication used was and effective was antihistamines with nasal steroids which was (68.9%). Second most common medication used to treat allergic rhinitis was antihistamine alone. (7.8%) of patients didn't need to use any medication.

Table (4-A): Allergic rhinitis complications.

Variable	No. Of cases	% of cases
1- Sleep problem		
- Difficult to sleep		
Note trouble	11	10.7
Mild	61	59.2
Moderate	19	18.4
Sever	12	11.7
- Waking at night		
not troubled	18	17.5
Mild	54	52.4
Moderate	19	18.4
Sever	12	11.7
- Lack of good sleep		
not troubled	12	11.7
Mild	50	48.5
Moderate	29	28.2
Sever	12	11.7
2- Non-High fever symptom		
- Fatigue		
not troubled	9	8.7
Mild	49	47.6
Moderate	30	29.1
Sever	15	14.6
- Thirst		
not troubled	7	6.8
Mild	53	51.5
Moderate	34	33.0
Sever	9	8.7
- Reduce productivity		
not troubled	7	6.8
Mild	51	49.5
Moderate	36	35.0
Sever	9	8.7
- Tiredness		
not troubled	3	2.9
Mild	46	44.7
Moderate	41	39.8
Sever	13	12.6

Table (4-B): Allergic rhinitis complications.

variable	No. Of cases	% of cases
- Poor concentration		
not troubled	6	5.8
Mild	46	44.7
Moderate	46	44.7
Sever	5	4.9
- headache		
not troubled	2	1.9
Mild	26	25.2
moderate	47	45.6
sever	28	27.2
- Worn out		
not troubled	13	12.6
Mild	39	37.9
moderate	37	35.9
sever	14	13.6
3- Practical problem		

- Inconvenience carry tissue		
not troubled	18	17.5
Mild	61	59.2
moderate	20	19.4
sever	4	3.9
- Need to rub nose		
not troubled	11	10.7
Mild	62	60.2
moderate	27	26.2
sever	3	2.9
- Need to blow nose		
not troubled	11	10.7
Mild	50	48.5
moderate	36	35.0
sever	6	5.8
4- Nasal symptoms		
- Stuffy nose		
not troubled	3	2.9
Mild	51	49.5
moderate	30	29.1
sever	19	18.4

Table (4-C): Allergic rhinitis complications.

variable	No. Of cases	% of cases
- Runny nose		
not troubled	7	6.8
Mild	45	43.7
moderate	38	36.9
sever	13	12.6
- sneezing		
not troubled	12	11.7
Mild	39	37.9
moderate	41	39.8
Sever	11	10.7
- Itchy nose		
not troubled	5	4.9
Mild	48	46.6
moderate	40	38.8
Sever	10	9.7
5- Practical symptoms		
- Itchy eyes		
not troubled	24	23.3
Mild	52	50.5
moderate	24	23.3
Sever	3	2.9
- Watery eyes		
not troubled	26	25.2
Mild	52	50.5
moderate	21	20.4
Sever	4	3.9
- Sore eyes		
not troubled	27	26.2
Mild	54	52.4
moderate	20	19.4
Sever	2	1.9
- Swollen eyes		
not troubled	38	36.9

Mild	45	43.7
moderate	18	17.5
Sever	2	1.9

Table (4-D): Allergic rhinitis complications.

Variable	No. Of cases	% of cases
6- Limitation of activities		
- Regular activity		
not troubled	26	25.2
Mild	50	48.5
Moderate	15	14.6
Sever	12	11.7
- Social activity		
not troubled	28	27.2
Mild	48	46.6
Moderate	17	16.5
Sever	10	9.7
- Outdoor activates		
not troubled	27	26.2
Mild	50	48.5
Moderate	17	16.5
Sever	9	8.7
7- Emotional effect		
- frustrated		
not troubled	14	13.6
Mild	65	63.1
Moderate	17	16.5
Sever	7	6.8
- Inpatient		
not troubled	8	7.8
Mild	62	60.2
Moderate	25	24.3
Sever	8	7.8
- Irritable		
not troubled	7	6.8
Mild	63	61.2
Moderate	29	28.2
Sever	4	3.9
- Embarrassed		
not troubled	16	15.5
Mild	60	58.3
Moderate	24	23.3
Sever	3	2.9

Table (4-E): Allergic rhinitis complications.

Variable	No. Of cases	% of cases
- Ear pain blockage		
not troubled	21	20.4
Mild	40	38.8
moderate	38	36.9
Sever	4	3.9
- Nasal discharge		
not troubled	9	8.7
Mild	46	44.7
Moderate	39	37.9
Sever	9	8.7
- Post nasal drip		
not troubled	8	7.8

Mild	37	35.9
Moderate	47	45.6
Sever	11	10.7
- Sore throat		
not troubled	6	5.8
Mild	41	39.8
Moderate	41	39.8
Sever	15	14.6
- Day time cough		
not troubled	14	13.6
Mild	43	41.7
Moderate	43	41.7
Sever	3	2.9
- Foul smell		
not troubled	23	22.3
Mild	37	35.9
Moderate	39	37.9
Sever	4	3.9
- Flue like feeling		
not troubled	15	14.6
Mild	31	30.1
Moderate	42	40.8
Sever	15	14.6
8- Sinus infection frequency		
ONCE	6	5.8
TWICE	27	26.2
MORE THAN 2	70	68.0

Table 4 shows the most common complications in allergic rhinitis, it was categorized to eight main categories, each category contained multiple variables and each one of those variables was categorized to (Not troubled, Mild, Moderate, Sever).

It was well noticed that most of patients who visited the clinic complaining of sleeping problems due to allergic rhinitis, were mostly noticed to be in the mild category for example difficult sleeping, walking at night, lack of good sleep, they were (59.2%, 52.4%, 48.5%) respectively. In addition, patient complaining of severe degree of same 3 symptoms, were well noticed but with less percent than those who came with mild and moderate complains, they were (11.7%, 11.7%, 11.7%) respectively.

It was well noticed that most of patients who visited the clinic complaining of practice problems due to allergic rhinitis, were mostly noticed to be in the mild and moderate category for example, mild category in inconvenience tissue carrying, need to rub nose frequently and need to blow nose frequently, were (59.2%, 60.2%, 48.5%) respectively. In addition, patient complaining of moderate degree of same 3 symptoms, were well noticed but with less percent than those who came with mild and moderate complains, they were (19.4%, 26.2%, 35.0%) respectively.

It was well noticed that most of patients who visited the clinic complaining of problems in limitation of general

activity due to allergic rhinitis, were mostly noticed to be in the mild category for example regular activity, social activity and outdoor activity, were (48.5%, 46.6%, 48.5%) respectively. patient complaining of moderate degree of same 3 symptoms, were well noticed, they were (14.6%, 16.5%, 16.5%) respectively. In addition, patient complaining of severe degree of same 3 symptoms, were well noticed but with less percent than those who came with mild and moderate complains, they were (11.7%, 9.7%, 8.7%) respectively.

5. DISCUSSION

The prevalence of allergic rhinitis increased with age with peak prevalence at age group (20-39). Compared to children and elderly, adults were more likely to have a diagnosis of allergic rhinitis. This finding match other studies which showed that the highest prevalence of allergic rhinitis occurred in the second and fourth decades of life.^[5,6]

The decrease in the prevalence of allergic rhinitis in elderly are related to decrease in the allergen specific IgE level.^[7]

In the United States, the *National Health and Nutrition Examination Survey* (NHANES) estimates that the prevalence of allergic rhinitis in the population is 23.5%, reaching 31.3% among 40–49 years old individuals.^[8]

Prevalence of allergic rhinitis according gender in this study, it was noticed that allergic rhinitis was mostly

seen in males. Compared to other study prevalence of allergic rhinitis is higher among male than female in age group < 10 years. Prevalence of allergic rhinitis in female during adolescence (11–17 years) is higher compared male. While in adulthood (18–79 years), there is no difference in prevalence between genders.^[9,10]

This difference among gender can be explained by the effect of sexual hormones, rates of allergic sensitization (specific immunoglobulin E production), different lifestyles, and adherence to treatment.⁽¹¹⁾ Four studies reported that male as a risk factor for allergic rhinitis in children, and our analysis supported this conclusion. ^(12, 13, 14) While other study showed allergic rhinitis diagnosis are mainly associated with the female sex.⁽¹⁵⁾ Environmental factors have showed role in the development of allergic rhinitis such as having barns reducing the risk of atopy. Patients with allergic rhinitis who had barns in this study showed (8.7%), many worldwide epidemiological articles have shown that children growing up on farms are protective against allergic rhinitis. ⁽¹⁶⁾ Among the risk factors for allergic rhinitis included in this study that showed high percent to have allergic rhinitis are cigarette smoking, cold temperatures, windy weather, perfume, and humidity.

Our results also confirm that tobacco smoking appeared more likely to increase the prevalence of allergic rhinitis symptoms in people and match other studies which confirm this association^[17] although other studies showed that smoking status and passive smoking to be non-significantly associated with allergic rhinitis.^[18] Smoking may increase the risk of IgE mediated allergen sensitization; it may make the symptoms more sever.^[19]

In this study shows allergic rhinitis reported exacerbation of health problems in cold weather. This relation also express in other study which indicated that those who had allergic rhinitis and asthma alone or in combination developed more cold weather-related respiratory symptoms than healthy subjects.^[20] Cold weather affects the respiratory airway by increase the vascular permeability induce bronchial hyperresponsiveness and destroying the airway epithelium. Cold air affects airways by causing cooling and drying decreasing respiratory function and increase inflammatory process in sputum.^[21] In winter indoor ventilation is poor (usually doors and windows are closed), leading to a high chance of allergen (pollen and house dust mite) exposure. Weather changes (temperature, wind speed, humidity, desert dust, etc.) are consider as a risk factors for AR. Climate change which can prolong the allergen season and create new sources of pollen due to new invasive species.^[22]

In this study show that allergic rhinitis usually happens after exposure to some volatile allergens of perfume that, a series of allergic symptom would appear. Some ingredients in perfumes are known to be airway sensitizers mostly mediated by IgE (especially

histamines) and exacerbated by many immune-active cells, cytokines, and inflammatory markers.^[23]

Most patients of allergic rhinitis can be treated effectively pharmacotherapy. The main goal of allergic rhinitis treatment is to prevent or reduce the exposure of the allergen. The management of allergic rhinitis includes allergen avoidance, pharmacotherapy, and immunotherapy. Current pharmacologic options include oral and intranasal antihistamines, intranasal corticosteroids, oral and intranasal decongestants, oral and intranasal anticholinergics, and leukotriene receptor antagonists.^[24] In our study the most common medication used was antihistamines with nasal steroids.

Allergic rhinitis can adversely affect patient's life, due to chronicity nature of the disease it dramatically affect patient quality of life. Our study demonstrated that allergic rhinitis has negative impact on patient's quality of life (daytime symptoms, sleep disturbances, practical problems during wake time, and limitation of the activity that may affect the daily work and productivity) that match with the result of other studies.^[25,26]

6. CONCLUSION

Allergic rhinitis is a global health problem, the high prevalence of allergic rhinitis need action to reduce environmental and lifestyle risks associated with these related condition as that the first line of therapy is reduce the exposure of allergens. The study shows risk factors of allergic rhinitis that exacerbation of symptoms and increase the severity of disease (Cigarette smoking showed high percent to have allergic Rhinitis which was (55.3%), cold temperatures, windy weather, perfume, and humidity). Strategies are required to monitor and control this risk factors. Allergic rhinitis has negatively affected the quality of life. Further studies are required to evaluate the causes, optimized the medical resources and establish effective management plans that help the patients benefit from a proper diagnosis and treatment.

7. Conflicts of interest

The authors declare that they have no conflicts of interest.

8. Source of funding

Self.

9. Ethical Statement

The study was approved by the Jordanian Institutional Review Board. Being a retrospective study, all patient identifiers were available only to the main research military physicians and all subjects participating in this study had informed consent.

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