

## Is Marriage a Risk Factor for Allergic Rhinitis?

Sara Safar AlShehri and Kamal-Eldin Ahmed Abou-Elhamd\*

Department of ENT Surgery, College of Medicine, King Faisal University, Al-Ahsa, Saudi Arabia

\*Corresponding author: Kamal-Eldin Ahmed Abou-Elhamd, Doctorate Degree of ENT, Professor, Department of ENT Surgery, College of Medicine, King Faisal University, Al-Ahsa 31982, Box 400, Saudi Arabia, Tel: 00966 508580065; E-mail: [kamal375@yahoo.com](mailto:kamal375@yahoo.com)

Received date: September 12, 2016; Accepted date: October 07, 2016; Published date: October 14, 2016

Copyright: © 2016 AlShehri SS, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

### Abstract

**Objective:** Our study aimed to determine the effect of marriage and sexual activity as risk factors for allergic rhinitis and to figure out degree of impact of consanguinity in the Saudi population on allergic rhinitis.

**Study design:** A cross sectional study.

**Methods:** The study was conducted at the outpatient ENT clinic of King Faisal University polyclinic centre at the period from October 2015 to February 2016. A random of 60 patients of age group 20-55 years old including both sex. The inclusive criteria were patients experienced symptoms related to out- door, indoor allergic rhinitis in the past 12 months. All of them were married and subjected to a questionnaire. It included 21 questions assessing symptoms of allergic rhinitis to verify the diagnosis, and its frequency and severity. It also included the marital details and patterns of consanguinity.

**Results:** Seven female patients (out of 24=29%) and 4 male ones (out of 25=16%) admitted experience of post coital exacerbation of allergic rhinitis attacks.

**Conclusion:** Marriage and sexual activity are risk factors for allergic rhinitis as 18% of our study experienced post coital exacerbation of allergic rhinitis attacks. However, vasomotor rhinitis might be a possible diagnosis if the patient age is above 35 with no family history of allergies.

**Keywords:** Allergic rhinitis; Allergy; Vasomotor rhinitis; Marriage; Sexual activity, Coital; Saudi arabia

### Introduction

Allergic rhinitis is a chronic inflammatory disease characterized by recurrent attacks of nasal obstruction, nasal discharge and sneezing. It is hypersensitivity reaction type 1 with release of chemical mediators and cytokines on exposure to an allergen and is mediated by antibody IgE [1]. Several known link factors of allergic rhinitis have been documented. There is clear evidence to support the concept that allergic diseases are influenced by genetic predisposition and environmental exposure [2].

Vasomotor rhinitis is non-allergic rhinitis with symptoms and signs which are closely resemble those of allergic rhinitis and are difficult to differentiate from those resulting from allergy [3]. Its pathophysiology is unknown, and it is often classified as idiopathic rhinitis [4]. However, patients with symptoms onset later in life above age of 35 years, no family history of allergies and no seasonality have about 95% likelihood of having a physician diagnosis of non-allergic rhinitis and vasomotor if happens with exposure to a certain factor such as sexual activity [5].

The effect of marriage as an environmental stressor on exposure and exacerbation of AR is not well understood nor it is comprehensively

studied, and thus, it needs more detailed research to study such correlation. Emotional stress and exercise were reported as stimuli for allergic rhinitis. Shah and Sircar in 1991 reported that sexual intercourse is a stimulus for AR too [6]. Post coital rhinitis can easily be overlooked due to patient embarrassment and unawareness of physicians. Sexual activity can trigger off asthma in more than one way, in some asthmatic subjects. Sexual excitement associated with anxiety can cause asthma as well as AR.

This has been recognized as post coital asthma and rhinitis and can occur in both males and females [6]. Falliers in 1976 described Sexercise-induced asthma as asthmatic episodes that cannot ascribed to any cause other than sexual excitement [7]. Intense emotional stimuli during sexual intercourse can lead to autonomic imbalance with parasympathetic over reactivity, thereby causing release of mast cell mediators that can provoke post coital rhinitis in these patients [8].

Earlier studies in psychosomatic medicine have linked type I on immunoglobulin E (IgE) mediated allergic disease as allergic rhinitis with psychological disturbance, particularly negative affecting states including depression and unhappy marriage [9]. An immune diversity of reactions may be encountered in female patients with hypersensitivity to seminal fluid (Human Seminal Plasma Allergy; HSPA). Bernstein et al. in 1981 reported disruption of maternal immune response during pregnancy, especially IgE specific suppresses T-cell [10].

1-Name written as a number:      2-Age .....      3-Sex:  Male  Female

4-Occupation.....      5-Residency:  Urban  Rural

6-Smoking:  YES  NO

7-Education level:  Uneducated  Elementary school  Middle school  High School  Collage level or above

8-Family history of allergic rhinitis:  YES  NO

9-If the answer in previous question yes, which family side:  Paternal  Maternal

10- Pollen exposure or pet exposure:  YES  NO

11-Marrige: A-Duration.....B-Uses of oral contraceptive pills:  YES  NO

C-Consanguinity:  YES  NO      E-Degree of relativity.....

12-Sleep time per night:  <7 hours  >7 hours

13-Stress level:  NO stress  Little stress  Moderate stress  Severe stress

14-Variation of symptoms:  Seasonal  All the year (perennial)

15-If it is seasonal in which season?  Summer  Atom  Winter  Spring

16-Timing of episodes of allergic rhinitis:  Early morning  Day time  Evening

Late night  Post coital

17-Which month of the year most (you can chose more than one answer)

18-Persistence of symptoms per weeks  <4 days  >4 days

19-Persistence of symptoms  <1 month  >1month

20-Severity of symptoms:  Mild  Moderate to sever

21-Receiving medication:  YES  NO

If the answer in previous question yes is it:  Regular  On demand

Figure 1: Questionnaire.

As the consanguinity rate is very high in the Middle East countries, especially on Arab countries, it is highly important to investigate the morbidity patterns of allergic rhinitis in contagious marriages, and the

extent, degree and pattern of the consanguinity in Saudi population suffering from atopic diseases like AR. It is of utmost importance to comprehend the correlation between contagious marriages and AR, for

better management of such case, and to know the prevalence among male and female in Kingdom of Saudi Arabia.

So, our study aims to determine the effect of marriage as risk factor for allergic rhinitis, and to figure out the extent of consanguinity in the Saudi population and degree of impact on allergic rhinitis.

## Material and Methods

### Ethical consideration

The design of the study was approved by the Institutional Review Board of our institution

The study was conducted at the outpatient ENT clinic of King Faisal University polyclinic Center at the period from October 2015 to February 2016.

A random population based cross sectional study of 60 patients of age group 20-55 years old including both sex. The inclusive criteria were patients experienced symptoms related to out- door, indoor allergic rhinitis in the past 12 months. All of them were married and subjected to a questionnaire (Figure 1). It included 21 questions assessing symptoms of allergic rhinitis to verify the diagnosis, and its frequency and severity. It also included the marital details and patterns of consanguinity.

The data were collected anonymously and then results were analyzed statistically using SPSS Version 22. Chi-Square test was used.

## Results

This study included 60 patients with age range (20-5) years. They were 31 females (51.7%) and 29 males (48.3%). Most of them had higher education (55=92%), employee (38=63%) and live in rural areas (48=80%). 17% of them were smokers and 18% usually expose to pollens. 48% have family history of allergic rhinitis in their parents. 70% sleep less than 7 h per day due to rhinitis. Most of the patients admitted having moderate stress in daily life (50%) and (23%) of them had little stress, while only (18%) were struggling with severe stress. 65% of our atopic patients experienced AR in special certain seasons, while 35% had AR all the months of the year. Table 1 shows seasons of affected patients. 35% of them have AR all the year.

	Frequency	Valid Percent
Valid Summer	8	13.3
Winter	11	18.3
Autumn	9	15
Spring	4	6.7
more options	7	11.7
All seasons	21	35
Total	60	100

**Table 1:** Numbers of affected patients per season.

Thirty-seven percent of our studied cases experienced allergic attacks in the early morning, followed by day time, followed by late night, then the least percent was for those who had it in the evening

time (Table 2). Most of the affected patients (54%) had the frequency of attacks more than 4 days per week.

	Frequency	Valid Percent
Early Morning	22	36.7
day time	16	26.7
Evening	2	3.3
late night	4	6.7
more options	16	26.7
Total	60	100

**Table 2:** Time of attacks of allergic rhinitis per day.

### Marriage and allergic rhinitis (Table 3)

The sixty patients were married for a period ranging from (1 month-38 years), third of them were relatives (35%). Only 10 females out of 31 used to take oral contraceptive pills (OCP) as a method of contraception. Seven female patients and 4 male ones admitted experience of post coital exacerbation of allergic rhinitis attacks (age of most of them less than 35 and family history of allergy, so possibility of allergic rhinitis is more than vasomotor rhinitis). There is a significant relationship between the degree of relatively and severity of symptoms with P value of 0.027.

## Discussion

There is an increase in the prevalence of AR and in both developed and developing countries in the last decades [11]. This study may be the first one which addresses the correlation between marriage as a proposed risk factor and allergic rhinitis in Saudi population. We used a questionnaire to interview patients but there was a telephone survey carried out to obtain the prevalence and risk factors of AR in 6 European countries [12].

In this study we found a higher prevalence of AR in rural areas 80%, while one of the largest epidemiological studies in China showed the opposite where they had higher prevalence of AR in urban areas [1].

The current study reported the proportions of 35% were persistent and 65% were intermittent, Similarly, In China results which showed 13% of the subjects were identified as persistent AR while 87% as intermittent AR, indicating intermittent type accounts for the majority of AR [1]. In Northern Europe 24.8% were identified as having persistent AR versus 53.8% were intermittent type [1]. This variation of persistent and intermittent between Saudi Arabia, China and Europe could be attributed to climate factors and sensitization to allergens.

Duration of Marraiage	Severity of symptoms		Chi-Sqare	P Value
	Mild	Moderate to sever		
1 Month-1 Year	7	3	3.214	0.234
2 Year-20 Years	28	8		
21 Years-40 Years	11	3		
Uses of oral contraceptive pills	Severity of symptoms		Chi-Sqare	P Value

	Mild	Moderate to sever		
NO	14	7	4.228	0.121
YES	10	0		
NONE	22	7		
Total	46	14		
Degree of relativity	Severity of symptoms		Chi-Square	P Value
	Mild	Moderate to sever		
2nd	15	2	7.242	0.027*
3rd	1	3		
None	30	9		
Total	46	14		
Gender	Postcoital period		Chi-Square	P Value
	No	Yes		
Female	24	7	0.773	0.379
Male	25	4		
Total	49	11		
Consanguinity	Postcoital period		Chi-Square	P Value
	No	Yes		
No	30	9	1.67	0.196
yes	19	2		
Total	49	11		

**Table 3:** Marriage and rhinitis findings.

AR of shorter duration (less than 4 days per week) is more common than AR of longer duration (4 or more days per week) in a Korean study [13], while we found the opposite in our study 53% of our recruited cases experienced AR more than 4 days per week indicating higher allergen load or higher susceptibility in our patients.

On discussing some risk factors like smoking and exposure to pollen grains, we have found that 83% of our cases were non smokers, and 70% showed no exposure to pollen.

Our results showed intake of medications were as follows 66% of studied cases took medications and 56% of them only received it on demand, in contrast to the Chinese study, 45% of their cases took medications [1].

Cold air and cold weather are top inducing factors for AR in winter. The changes of temperature in cold weather affects stability of parasympathetic supply of the nose and the dry air increases the vascular stability of the nasal mucosa leading to its hypersensitivity. This was consistent with our results in eastern province in Saudi Arabia, 18% of our cases (the largest percentage) had the attacks in winter. We have proved in our study that most of the cases had the

attacks in early morning time due to the presence of cold air in the early morning.

Recently Hyrkak et al. in 2014 underlined that cold weather-related respiratory symptoms could be thought to reflect functional changes in the airways, occurring as a result of either cooling of the skin or through the simultaneous cooling and drying of the nasal and airway mucosa on inhaling cold air [14]. Experimental studies have shown that these trigger responses such as congestion and rhinorrhea in the upper airways and bronchoconstriction in the lower airway.

These effects may be further intensified during exercise in the cold at high ventilation rates. Subjects with asthma may have an excess of cold-related respiratory symptoms because their capacity toward humidify the inspired air is reduced. In our study we found that more than 70% of our cases had mild type of AR rather than moderate to severe type. Higher stress levels increased the risk of AR in the present study.

Stress-related hypothalamic-pituitary-adrenal axis reacts to psychological stressors and triggers a cortisol response; this may explain our data in which 50% of our cases were having moderate stress which is may be related to the pathophysiology of AR development. This was also detected in a study done in Korea [13] who found the same results. In the same previously mentioned study short sleep duration have also been reported as risk factors for AR which was consistent with ours, where we found 75% of our cases did sleep less than 7 h per night.

The development of allergic rhinitis entails a complex interaction between genetic predisposition and environmental exposure to different factors, of which the most important is the implicated allergen. There is a clear hereditary component in allergic rhinitis that has been well corroborated by segregation studies and investigations in twins. From the strictly genetic perspective, it is believed that the disease may be the result of the interaction of different genetic alterations, each of which would contribute a small defect [15]. From this point arises the importance of studying family history of AR. A family history of AR was strongly associated with AR development in many studies. In agreement with previous reports, we found that a parental history of AR strongly influenced AR prevalence. A genetic predisposition to AR, or an environmental factor, may explain the high association between AR in parents and their children. Maternal AR symptom duration of over 1 month increases prevalence of AR in children as what was shown in a Korean study, in our study we have studied family history as one of the important risk factors for AR, 48% of our cases have positive family history and 20% of them from the mother's side.

On discussing the effect of marriage on appearance of allergic rhinitis symptoms, two previous studies could not find any prior description of an association between AR prevalence and marriage. One substantial study has connected marriage to positive physical and mental health outcomes [16]. Indeed, marriage exerted a protective effect on AR in the study done by An SY 2015 [13]. In contrast, unhappy marriage or dissatisfied marriage can put people under stress and health problems.

Thirty five percent of our study had positive contagious marriage, so consanguinity was statistically significant. It is well known that consanguinity marriage in the middle east and Arab countries is far much more than in the developed world. Such marriages are considered to be more stable, due to close similarities in social and

cultural values between the couple, and the economic benefits of keeping wealth within the families.

It is well known that exogenous sex steroidal hormones (oral contraceptive pills) can influence the development of wheezes in the chest in females [17], our studied cases didn't show any statistical significance correlation (16% of P value of 0.121).

Little was published about study of the relationship between marriage and sexual activity with allergic rhinitis. Human seminal plasma allergy (HSPA), in women, is a rare phenomenon. It is usually caused by sensitization to proteins present in the seminal fluid, leading to immediate hypersensitivity manifestations during or soon after coitus. Symptoms can range from local pruritus to life-threatening anaphylaxis [5]. This rare disorder is most commonly thought to be mediated by the classical IgE-mediated pathophysiological mechanism, but usually these cases are overlooked. Shad and Sircar, presented in 1991 cases report of four patients had experienced postcoital exacerbation of asthma and allergic rhinitis in India. Here in our study we have reported 11 cases 7 females and 4 males having postcoital exacerbation of allergic symptoms. This postcoital rhinitis or honeymoon rhinitis is most probably due to emotional excitement or autonomic parasympathetic over activity with cholinergic release of mast cell mediators. We have found that 6 cases from 11 cases having positive postcoital phenomenon, having positive family history of AR, and positive postcoital AR as well. Spring was found the most common month to flare the postcoital attacks. Only 2 patients had positive consanguineous marriage and positive postcoital AR.

However, we would like to stress that postcoital allergic rhinitis may be easily overlooked due to patient embarrassment or lack of awareness specially in our society, and hence it needs more detailed study to understand more about the pathophysiology and mechanisms which will lead to proper management and actual and adequate knowing of the prevalence of the disorder.

## Conclusion

Allergic Rhinitis prevalence in Eastern province of Saudi Arabia is significantly higher in the rural areas than urban areas. Intermittent allergic rhinitis is the predominant type, and of the mild form. The main trigger factors and risk factors are genetic factors like family history, and environmental factors like pollen and smoking. It is more common in winter, at the early morning time.

Eighteen percent of cases experienced postcoital exacerbation of allergic rhinitis attacks. However, vasomotor rhinitis might be a possible diagnosis if the patient age is above 35 with no family history of allergies.

## Acknowledgement

We would like to thank Anwar Sattam, medical student for her helpful work in datacollection. Our grateful thanks are also extended to Dr. Sayed Ibrahim Ali, Assistant professor of statistics for his assistances in the data analysis.

## References

1. Li CW, Chen de HDH, Zhong JT, Lin ZB, Peng H, et al. (2014) Epidemiological characterization and risk factors of allergic rhinitis in the general population in Guangzhou city in China. *PLoS One* 9: e114950.
2. Wang DY (2005) Risk factors of allergic rhinitis: Genetic or environmental? *Ther Clin Risk Manag* 1: 115-123.
3. Ma Y, Tan G, Zhao Z, Li W, Huang L, et al. (2014) Therapeutic effectiveness of endoscopic vidian neurectomy for the treatment of vasomotor rhinitis. *Acta Otolaryngol* 134: 260-267.
4. Lieberman P, Meltzer EO, LaForce CF, Darter AL, Tort MJ (2011) Two-week comparison study of olopatadine hydrochloride nasal spray 0.6% versus azelastine hydrochloride nasal spray 0.1% in patients with vasomotor rhinitis. *Allergy Asthma Proc* 32: 151-158.
5. Bernstein JA (2009) Characteristics of nonallergic vasomotor rhinitis. *World Allergy Organ J* 2: 102-105.
6. Shah A, Sircar M (1991) Postcoital asthma and rhinitis. *Chest* 100: 1039-1041.
7. Falliers CJ (1976) Sexercise-induced asthma. *Lancet* 2: 1078-1079.
8. Shah A (2001) Asthma and sex. *Indian J Chest Dis Allied Sci* 43: 135-137.
9. Bell RA, Daly JA, Gonzalez MC (1987) Affinity-maintenance in marriage and its relationship to women's marital satisfaction. *Journal of Marriage and the Family* 49: 445-454
10. Bernstein IL, Englander BE, Gallagher JS, Nathan P, Marcus ZH (1981) Localized and systemic hypersensitivity reactions to human seminal fluid. *Ann Intern Med* 94: 459-465.
11. Sly RM (1999) Changing prevalence of allergic rhinitis and asthma. *Ann Allergy Asthma Immunol* 82: 233-248.
12. Bauchau V, Durham SR (2004) Prevalence and rate of diagnosis of allergic rhinitis in Europe. *Eur Respir J* 24: 758-764.
13. An SY, Choi HG, Kim SW, Park B, Lee JS, et al. (2015) Analysis of various risk factors predisposing subjects to allergic rhinitis. *Asian Pac J Allergy Immunol* 33: 143-151.
14. Hyrkas H, Jaakkola MS, Ikaheimo TM, Hugg TT, Jaakkola JJ (2014) Asthma and allergic rhinitis increase respiratory symptoms in cold weather among young adults. *Respiratory Medicine* 108: 63-70.
15. Dávila I, Mullol J, Ferrer M, Bartra J, del Cuvillo A, et al. (2009) Genetic aspects of allergic rhinitis. *J Investig Allergol Clin Immunol* 1: 25-31.
16. Meyler D, Stimpson JP, and Peek MK (2007) Health concordance within couples: A systematic review. *Social Science & Medicine* 64: 2297-2310.
17. Salam MT, Wenten M, Gilliland FD (2006) Endogenous and exogenous sex steroid hormones and asthma and wheeze in young women. *J Allergy Clin Immunol* 117: 1001-1007.