Original Research Article

Prevalence of Migraine Headache in Patients with Allergic Rhinitis

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Abstract

Aim: Migraine headache and allergic rhinitis are both common disorders. Several studies have reported that migraine headache is more common in patients with allergic rhinitis**.** Aim of this study is to determine if the allergic sensitization is associated with the prevalence, frequency, and disability of migraine headache in patients with allergic rhinitis. **Methods and Material:** The study was conducted during the period February 2021-Sep 2021. During this period 100 patients of either gender who were diagnosed with allergic rhinitis clinically were selected and total serum IgE levels were estimated. Prevalence of migraine headache and degree of allergic sensitization was estimated in these patients. **Results:** A total of 100 patients with allergic rhinitis who presented to the outpatient department where studied, out of which 73 had migraine. Prevalence of migraine in patients with allergic rhinitis is higher in females compared to males. Males had a higher IgE levels. At the younger age group IgE levels were higher. Patients with higher levels of Ig E had more severe headaches compared to those with lower levels of Ig E. Patients with higher levels of Ig E required a longer duration of treatment compared to those with lower levels of IgE. **Conclusions:** Prevalence of migraine headaches is very high in patients with allergic rhinitis which shows that allergic rhinitis could be an individual risk factor for development of migraine headaches. Younger age and female sex are other contributory factors as prevalence of both allergic rhinitis and migraine is higher in these groups. Degree of allergic sensitisation determines the severity and frequency of headaches in those whom allergic rhinitis is a risk factor as evidenced by higher levels of Ig E.

Keywords: Migraine, Allergic Rhinitis, IgE.

Introduction

Migraine headache and allergic rhinitis are both common disorders. Several studies have reported that migraine headache is more common in patients with allergic rhinitis. [1] Atopy, which is the genetic predisposition to develop IgE antibodies to specific allergens, may be associated with increased frequency of migraine headache. [2]

Other studies found that migraine headache improved or were eliminated altogether in patients that followed an elimination diet of common food allergens.

Thus, limited data exist to support the contention that exposure to allergens increases the frequency of migraine attacks in atopic migraineurs. [3,4]

Immunotherapy can induce tolerance to specific allergens by altering cytokine responses of T-helper cells and through induction of IgG and IgA antibodies that block the binding of IgE to mast cells. Thereby providing an alternative approach in treatment of migraine in patients with allergic rhinitis.

Aim of this study is to determine if the allergic sensitization is associated with the prevalence, frequency, and disability of migraine headache in patients with allergic rhinitis**.**

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Objectives

1. Determine if the degree of allergic sensitization is associated with the prevalence of migraine headache in individuals with allergic rhinitis.
2. To ascertain whether these variables impact the frequency and disability of migraine headache.

Materials and Methods

Source of the Data

The present study was conducted in the Department of Otorhinolaryngology, MGM Hospital attached to Kakatiya Medical College, Warangal, Telangana, India.

Methods of Collection of Data

The study was conducted during the period Feb 2021-Sep 2021. During this period 100 patients of either gender who were diagnosed with allergic rhinitis clinically were selected and total serum IgE level was estimated.

We hypothized that individuals with allergic rhinitis with greater degrees of allergic sensitization (increased IgE levels in serum) would be more likely to experience migraine headaches and that their attacks would be more frequent and disabling than those with lower degrees of atopy.

Inclusion criteria

1. ages 18-65 years;
2. ability to give informed consent;
3. a confirmed diagnosis of allergic rhinitis.

Exclusion criteria

1. Past history of secondary headache disorders such as a brain aneurysm or brain tumor;
2. Significant chronic medical illnesses such as malignancy, chronic renal failure, tuberculosis, lupus, rheumatoid arthritis,sarcoidosis, hypereosinophilic syndrome, Wegener's granulomatosis, Churg-Strauss vasculitis, and polyarteritis nodosum;
3. Pregnancy.

Procedure

All participants were asked if they had experienced headaches in the last year unrelated to respiratory infection, head trauma or hangover. If they give an affirmative response to the above question then a structured verbal headache interview was administered to determine the characteristics of each headache type.

All classifiable headache diagnoses had met strict criteria of the International Classification of Headache Disorders-II-2004. Migraine headache was defined as ICHD-2 diagnoses of 1.1-1.5. Severity of headache was assessed based on MIDAS score.

Statistical Analysis

Descriptive tables were generated showing the demographic and clinical characteristics of participants stratified by migraine status (migraineur, nonmigraineur) and migraineurs stratified by age. Differences between subject groups were assessed by chi-square test.

Results

A total of 100 patients with allergic rhinitis were included in the study. Out of which 73 patients had migraine and the rest were non migraneurs.

Table 1: Distribution of diagnosis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	AR+ M	73	73.0	73.0	73.0
	ARs	27	27.0	27.0	100.0
	Total	100	100.0	100.0	

Table 2: Association between Diagnosis and sex Diagnosis * sex Cross tabulation

		Sex		Total
		Female	Male	
Diagnosis	AR+ Count M % within sex	56 75.7%	17 65.4%	73 73.0%
	AR Count % within sex	18 24.3%	9 34.6%	27 27.0%
Total Count % within sex		74 100.0%	26 100.0%	100 100.0%

In this study out of 74 females 56 (75.7%) had migraine along with allergic rhinitis and the rest 18 (24.3%) patients were non migraneurs. However out of 26 males 17(65.4%) of them had migraine with allergic rhinitis and the rest 9(34.6%) were non migraneurs.

Table 3: Age group distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	38	38.0	38.0	38.0
	2	29	29.0	29.0	67.0
	3	22	22.0	22.0	89.0
	4	11	11.0	11.0	100.0
Total		100	100.0	100.0	

In this study majority patients were in the age group of 18 to 28 years.

Table 4: Association between age and diagnosis age

		Diagnosis		Total
		1	2	
Age	1	26	12	38
	2	23	6	29
	3	14	8	22
	4	10	1	11
Total		73	27	100

In this study majority of migraneurs and non migraneurs with allergic rhinitis were in the age group of 18 to 28 years, however as the p value was >0.5 statistically there was no association between age and diagnosis.

Table 5: Correlation between age and IgE levels

		IgE	Age
IgE	Pearson Correlation	1	.092
	Sig. (2-tailed)		.362
	N	100	100
age	Pearson Correlation	.092	1
	Sig. (2-tailed) N	.362 100	 100

Negative correlation between IgE level and age, r= -0.092

In this study as depicted in the above table and graph there was a negative correlation between age and IgE levels with r=-0.092 , which implies that at the younger age group IgE levels were higher.

Table 6: Sex and Ig E

Sex	IgE (Mean, SD)
Female	1215.91(1659.7)
Male	1256.1(1565.5)

In this study the mean Ig E level among female patients was 1215.91 and among male patients was 1256.1,which shows that the mean IgE level was higher among males. However the standard deviation in females was higher compared to males due to higher number of females in this study.

Table 7: Severity of headache and IgE level

Severity	IgE (Mean, SD)
Mild	373.75(142.69)
Moderate	784.54(293.97)
Severe	3523(2088.03)

In this study patients with higher levels of Ig E (mean 3523) had more severe headaches compared to those with lower levels of Ig E. In this study the patients with allergic rhinitis with migraine had higher IgE levels compared to other group.

Table 8: Duration for complete relief

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<3 Months	44	44.0	44.0	44.0
	3-6 Months	42	42.0	42.0	86.0
	>7 Months	14	14.0	14.0	100.0
Total		100	100.0	100.0	

In this study majority of patients had complete relief from migraine within 3 months of starting treatment.

Table 9: IgE level and duration for complete relief

Duration for complete relief	IgE (Mean, SD)
<3	313.5(160.45)
3-6	1232.6(1142.8)
>7	4076.4(2100.6)

In this study the patients with higher levels of Ig E required a longer duration of treatment compared to those with lower levels of IgE.

Discussion

This is one of the rare studies which helps to determine if the degree of allergic sensitization are associated with the prevalence, frequency and disability of migraine headache in patients with allergic rhinitis. Past studies have assumed that the effect of allergy on migraine headache is uniform across all atopic patients. Our results suggest that the associations between allergy and migraine headache may depend upon the degree of allergic sensitization, Ig E levels, sex and patient age.

The prevalence of migraine in this study was 73% among those who had allergic rhinitis. Other similar studies such as Ku et al and Scarupa et al [5,6]have reported prevalence of migraine among allergic rhinitis to be 26%. Another study by Saberi et al [7] reported the prevalence of migraine to be 37%. Hence in our study prevalence of migraine headaches in patients with allergic rhinitis was found to be higher than other studies.

In this study out 100 patients 74 were females and 26 were males. Out of 74 females 56 (75.7%) had migraine along with allergic rhinitis and the rest 18 (24.3%) patients were non migraneurs. However out of 26 males 17(65.4%) of them had migraine with allergic rhinitis and the rest 9(34.6%) were non migraneurs. A study done by Saberi et al [57] showed a prevalence of 35.7% among males and 37.5% among females.

In this study majority patients were in the age group of 18 to 28 years. In a study conducted by Mösges et al age prevalence of allergic rhinitis with migraine was maximum in age group of 15 to 30 years which is comparable to this study [8]

In this study majority of migraneurs and non migraneurs with allergic rhinitis were in the age group of 18 to 28 years, however as the p value was >0.5 statistically there was no association between age and diagnosis.

In this study there was a negative correlation between age and IgE levels with r=-0.092 , which implies that at the younger age group IgE levels were higher. In a study conducted by Omenaas E et al[59] the mean Ig E levels where higher in younger age groups which is similar to this study.

It was observed in this study that males had a higher IgE levels which is similar to the study conducted by Omenaas E et al [9]

In a study conducted by Borish et al [10] the mean study among males were 2945 whereas among females it was 1792 in this study mean IgE levels among males was 1256.1 and among females was 1215.91

In this study majority of patients had complete relief from migraine within 3 months of starting treatment. In a study conducted by Kalra et al [11]the duration of treatment for migraine depends on the type of drug used and the severity of migraine. However his study has shown that an average duration of treatment for migraine is around 3-6 months which is comparable to this study.

In this study the patients with higher levels of Ig E required a longer duration of treatment compared to those with lower levels of IgE. As discussed earlier, this study has shown that patients with higher levels of serum IgE levels have more severe headaches. Study done by Kalra et al [10] has shown that duration of treatment depends on the severity of headaches which correlates with the findings in this study that the patients with higher levels of serum IgE require longer duration of treatment. In this study all patients improved with treatment.

Limitations of the study

1. As majority of patients had pre-existing allergic rhinitis with migraine incidence could not be calculated.
2. As the study group included only patients between age group of 18-65 years the mean Ig E levels measured may not reflect the actual gender specific Ig E levels as IgE levels are higher in younger age groups.

Conclusion

1. Prevalence of migraine headaches is very high in patients with allergic rhinitis which shows that allergic rhinitis could be an individual risk factor for development of migraine headaches.
2. Younger age and female sex are other contributory factors as prevalence of both allergic rhinitis and migraine is higher in these groups.

3. Degree of allergic sensitisation determines the severity and frequency of headaches in those whom allergic rhinitis is a risk factor as evidenced by higher levels of Ig E.

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