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A COMPARATIVE STUDY OF ALLERGIC RHINITIS IN GENERAL POPULATION AND POPULATION IN RESTRICTED PREMISES

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ABSTRACT

Allergic rhinitis is a major health problem worldwide and its incidence is gradually increasing with the change in environmental conditions and change in life style. It is not a life threatening condition but its impact on the efficiency of the individual is significant leading to an impact on productivity and performance at school and office of the general population. Population living in restricted premises are less likely to be exposed to environmental factors, pollution and seasonal changes. Our present study is a comparative study to find out the incidence of allergic rhinitis and type of allergic rhinitis in general population and population living in restricted premises and study the role of various etiological factors in determining the course of the disease in both the population.

INTRODUCTION

Allergic rhinitis is a significant health problem worldwide as its prevalence is continuously increasing . Today 10-25% inhabitants of the world suffer from allergic rhinitis. In the past 40 years, incidence of allergic rhinitis has increased due to industrialization and urbanization which has caused increase in exposure to allergen, pollution and irritants as well as life style changes, dietary modification responsible for diminution of protective nutrients, decrease in infection leading to reduction in immune responses. (1,2,3)

Although not a life threatening condition the socioeconomic impact of allergenic rhinitis is substantial as condition is chronic and cannot be cured. It includes not only the cost of disease management and associated condition such as asthma, sinusitis, nasal polyp, lower respiratory tract infection but also affects the quality of life of many patients with impact on productivity at work and school performance causing absenteeism from work, sleep disorder, poor concentration, impaired learning, depression, anxiety etc. (4,5,6,7)

Nasal allergy or allergic rhinitis also called pollenosis or hay fever is a quite common condition in otorhinolaryngology practice. It is defined as a symptomatic disorder of the nose induced after mediated inflammation of membrane lining the nose. (8)

The inflammation is caused by excessive degranulation of mast cell and its and its classified as Gell and Coombs type -1 immediate hypersensitivity reaction. Inhalant allergens lead to type-1 allergic reaction that affect approximate 30% of the adults and 40% of child in west (Skoner 2001).(9)

Common symptom of allergic rhinitis include (Merk et al, 1998)

- Running nose or nasal congestion.
- Frequent sneezing
- Itchy watery eyes.
- Itching in nose, throat, roof of mouth.

Presence of two or more symptoms for >1 hour on most days indicate allergic rhinitis.

There are several risk factors for Allergic Rhinitis. The most established risk factor is a family history of atopy and serum IgE levels more than 100 IU/ml before 6 years of age. The disease has been associated more with the elite population as compared to the lower socio-economic strata. The diagnosis of Allergic Rhinitis includes thorough workup of the patient including the family history of allergy, the meticulous history of the symptoms, and detailed otorhinolaryngology examination. In addition, allergy tests including skin prick tests, total serum IgE and serum specific IgE levels should also be undertaken to come to a final conclusion. Nasal endoscopy may be required for helping in diagnosis. Nasal secretions cytology, nasal challenge tests and radiology part of computerised tomography may also be included work up if required. (9) Avoidance of allergens and irritants is the first step in the management of allergic rhinitis.

Medication include antihistaminic, nasal and oral decongestant, mast cell stabilisers, inhalant anticholinergic, systemic and nasal corticosteriod, anti leukotriene agents and systemic immunotherapy

MATERIALS AND METHODS

The present study entitled "**COMPARATIVE STUDY OF ALLERGIC RHINITIS IN GENERAL POPULATION AND POPULATION IN RESTRICTED PREMISES"** was carried out on OPD patients in Department of Otorhinolaryngology and Head & Neck Surgery, Gajra Raja Medical College, Gwalior (M.P.) and associated J.A. Group of Hospitals and prisoners in Central Jail, Gwalior which were taken as population in restricted premises during the year October 2011 to September 2012 on patients diagnosed with allergic rhinitis. The study includes 100 patients in each group.

A detail history and clinical examination was done on all the patient and informed consent was taken from all of them.

The following routine & special investigation were performed in each case -

(a) Routine Heamatological examination like CBC, blood sugar etc.33
(b) Nasal examination for eosinophils
(c) Absolute eosinophil count.

Inclusion Criteria:

1. Males or females of any ethnic group and age group between 12 years to 70 years.
2. Subject with following symptoms -

- Watery rhinorrhoea.
- Bouts of sneezing.
- Nasal Obstruction.

Exclusion Criteria:

1. Pregnancy or lactation.
2. Age <12 &>70 years.
3. Alcohol dependents.
4. Presence of medical condition that might interfere with study.
5. Subject with multiple drug therapy.

On the basis of thorough preliminary and detailed history taking,

general, systemic and otorhinolaryngological examination and investigations of each patient they were diagnosed as follows

1 Type of allergic rhinitis, whether perennial or seasonal.
2 The association of symptoms with any detectable allergen, the inhalant, the ingestant, the infectant, the contactant, the drug allergen and/or predisposing factors.
3. The association of allergic rhinitis with disposition of nasal septum, whether central or deviated.
4. The association with paranasal (specially maxillary) sinusitis.
5 The association with bronchial asthma or/and other allergic diseases.
6 The association with blood and /or nasal smear eosinophilia. (Normal blood eosinophil count was taken as 0-4 percent).

RESULTS

The following conclusions are drawn from the study

- Allergic rhinitis is more common in 3rd and 4th decade in population in restricted premises compared to 2nd and 3rd decade in general population.
- In general population, allergic rhinitis is more common in males
- Different etiological and predisposing factors do not have much influence on allergic rhinitis in two groups.
- On the basis of duration of symptoms, it can be concluded that there is increase incidence of allergic rhinitis in population in restricted population
- Nasal obstruction is the main symptom and headache is the main associated symptom in population in restricted premises compared to rhinorrhoea and sneezing as the main symptom and ocular itching as the main associated symptom in general population.
- Condition of turbinate and septum, mucosal appearance and nature of discharge do not have much influence on allergic rhinitis in two groups.
- On the basis of this study, it can be concluded that perinneal allergic rhinitis is more common in restricted population and seasonal allergic rhinitis in general population.
- Co-morbid conditions associated with allergic rhinitis like asthma and sinusitis are more common in population in restricted premises.
- In population in restricted premises, in x-ray PNS more radiological changes were found.

DISCUSSION

The present comparative study was carried out for both the groups on the following aspects

(1) AGE

In our study age ranged from 12 yrs to 69 yrs. It was observed that maximum number of cases (37%) were in the age group 21-30 yrs followed by 31-40 yr in which 29% cases, which is in accordance with the study conducted by **R. Nepali et al (2012)** in which maximum number of cases (38.1%) in the age group of 20-29 followed by 25.5% cases in 30-39 yrs age group. (12)

In general population maximum number of cases (39%) are in age group 21-30 yrs followed by 24% cases in age group 11-20 yrs with only 1% case above 61yr of age while in population in restricted premises only 6% cases in age group 11-20yr and 12% cases with age above 60yrs.This difference in age group may be due to the fact that most of the prisoner enter jail after the 2nd decade of their life.

(2) SEX

In our study, female patients are not taken in the population in restricted premises. In general population females are taken and it was observed that male dominated the study with 65% male and 35% female. These observation are consistent with the study of **Naveen Kumar et al (2012)** in which 62% were male and 38% female.(17) **R. Prasad et al** conducted study in which 58.33% cases were male and 41.67% cases were female.(18) These above studies are in concordance with our studies.

In study by **J. Latha et al (2011)**, maximum patient (48%) are in age group 20-40yrs. (10)

In general population maximum number of cases (39%) are in age group 21-30 yrs followed by 24% cases in age group 11-20 yrs with only 1% case above 61yr of age while in population in restricted premises only 6% cases in age group 11-20yr and 12% cases with age above 60yrs.

This difference in age group may be due to the fact that most of the prisoner enter jail after the 2nd decade of their life.

(3) DIFFERENT ETIOLOGICAL FACTORS

In our study,in general population, inhalants are most common (58%) etiological factor followed by multiple allergens (12%) and unknown allergens (10%).

In population in restricted premises inhalants are the most common (40%) etiological factor followed by unknown causes (16%) and multiple allergens (10%).

Study by **E. Shahar et al (2001)** showed that 8% suffer from food allergens and 8% suffer from skin allergen.(19)

Al Saeed et al (2007) shows that most common allergen is pollen (66.9%).(14)

(4) PREDISPOSING FACTORS

In our study, 24% patients in general population have family history as compared to 16% patients in population in restricted premises.

Dold Sigrid et al (1992) conducted study in which 16% of children with one allergic parent and 25% if both parents are allergic. This study supports our findings(13)

In our study, in general population 56% cases are affected with weather changes and most commonly in rainy season(17%) followed by humid and dumpy atmosphere(14%).as compared to 54% cases affected by weather changes in restricted premises and most commonly by humid and dumpy atmosphere (20%). which is common in restricted premises like jail.

(5) DURATION OF SYMPTOMS

In our study, in general population 60% cases presents with duration of symptoms less than 5 yrs, 32% cases present with duration 6-10 yrs and 8% with duration more than 10 yrs as compare to this , population in restricted premises has maximum number of cases (75%) present with duration less than 5 yrs. and only 4% cases presents with more than 10 yrs duration.

The cause of short duration of symptoms in population in restricted premises may to be due to the fact that many of the cases develop complaint after entering the restricted premises.

This finding leads to conclusion that there is increase incidence of allergic rhinitis.

MAIN SYMPTOMS

In general population, main symptom is rhinorrhoea (95%) and sneezing (90%) followed by nasal obstruction(72%) and nasal itching (52%) with typical triad of allergic rhinitis in 60% cases in comparasion to population in restricted premises in which nasal obstruction (88%)presents as the main symptom followed by rhinorrhoea (74%), sneezing(63%), nasal itching(44%) with typical triad of allergic rhinitis in 44% cases

Most common associated symptom in general population is ocular itching (65%) followed by nasopharyngeal itching (61%) and lacrimation(60%) as compared to population in restricted premises in whichwas headache(76%) is most common associated symptom followed by nasopharyngeal itching(68%)

Observation in general population is consistent with study conducted by **yadav et al(2001)** in which sneezing in 100% , nasal discharge in 90% and nasal obstruction in 72.5% and itching in 57.5% cases.(11)

Our finding in population in restricted premises consistent with **Naveen Kumar et al (2011)** in whose study nasal obstruction in 80.9% and sneezing in 50.8%, nasal itching in 38.1% but rhinorrhoea in 100% cases which is not in co-relation with our study (17)

The cause of nasal obstruction as main symptom in population in restricted premises may be due to the humid and moist environment and congestion in restricted premises. Headache as most common associated symptom may be due to psychological factor or co-morbid conditions

(7) MUCOSAL APPEARANCE

In general population, 65% cases have pale-boggy mucosa and 4% cases have pale-bluish mucosa followed by 6% with bluish , 10% with purple and 15% cases have normal mucosa compared to population in restricted premises in which 59% having pale boggy mucosa and13% have pale bluish mucosa followed by 10% with bluish, 8% with purple and 10% cases have normal mucosal appearance

Naveen Kumar et al (2011) show that 81% cases have pale mucosa which is near to our study. (17)

(8) CONDITION OF TURBINATES

In general population, 68% cases have hypertrophied turbinate compared to 77% cases in population in restricted premises which may be because of infections and co-morbid conditions.

(9) DIFFERENT TYPES OF NASAL DISCHARGE

In general population and population in restricted premises discharge is watery in 78% and 68% cases respectively followed by mucopurulent discharge in12% and 22% cases respectively.

The increase in no of cases with mucopuralent discharge in population in restricted premises may be a result of associated co-morbid conditions and infective etiology which is more in restricted premises

(10) DIFFERENT TYPES OF ALLERGIC RHINITIS

In our study, In general population,58% cases presents with seasonal and 42% cases presents with perinneal allergic rhinitis as compared to 27% cases with seasonal and 73% cases presents with perinneal allergic rhinitis in population in restricted premises

Our finding in population in restricted premises consistent with **Nabavizadih et al(2007)** in which 25% cases were seasonal and 75% cases have perinneal allergic rhinitis. (20)

Our finding is further supported by **Crown et al(2003)** in his study show that 79% cases have perinneal and 21%cases have seasonal allergic rhinitis(21)

On the basis of above observations, it can be concluded that perinneal allergic rhinitis is more common in restricted premises.

(11) DIFFERENT TYPE OF SEPTAL DEVIATIONS

Maximum number of cases (68% and 66%) present with Deviated Nasal Septum in general population and population in restricted premises respectively, rest cases present with midline septum.

(12) ASSOCIATION WITH SINUSITIS

On the basis of x-ray findings and clinical symptoms,25% cases in general population and 34% cases from population in restricted premises presents with sinusitis.

Our finding for population in restricted premises consistent with study by **Wu J et al(2005)** in which 32% cases with perinneal allergic rhinitis has chronic sinusitis.(16)

Increase incidence of sinusitis in population in restricted premises may be due to congested environment and humid and damp environment

(13) ASSOCIATED ASTHMA

On the basis of chest auscultation and clinical symptoms, 18% cases in general population and 31% cases from population in restricted premises presents with bronchial asthma.

This finding is in concordance with the study conducted by **Elias Mir et al** on schoolgoing children in which 17-38% patients have asthma associated with allergic rhinitis. (22)

(14) ASSOCIATED WITH BLOOD EOSINOPHILIA

In our study, 63% cases in general population and 70% cases in restricted premises present with blood eosinophilia. These results are not consistent with those of **Naveen Kumar et al** in which 54% cases present with blood eosinophilia.(17)

In our study,19% cases in general population and 21% cases in restricted premises present with blood eosinophilia more than10% as compared to study in Saudi Arabia, in which eosinophilia of more than 10% found in 27% children.

ASSOCIATED WITH NASAL SMEAR EOSINOPHILS

In our study, only cases from general population were examined for nasal eosinophilia, as facility of nasal smear examination was not available in restricted premises.

Though various workers have found varying results for nasal smear eosinophilia ranging from 18% to 81%.

In general population, 55% cases have eosinophils in nasal smear which is consistent with study of **Naveen Kumar et al(2011)** in which nasal smear eosinophils is 52.4% cases(17)

CONCLUSION

Allergic rhinitis is common in both general population and population in restricted premises such as jail. While seasonal allergic rhinitis is more common in general population as they are exposed to environmental changes more often ,the population in restricted premises suffer from perennial allergic rhinitis as they are persistently exposed to the same allergens in a closed environment with little or no affect of outside variations. The damp and humid conditions, close proximity and lack of ventilation further exacerbates the situation and add to the woes of the population residing in restricted premises.

OBSERVATIONS

Table No. 1 Age Incidence

S. No.	Age group (yrs)	General population		Population in restricted premises	
		No.	%	No.	%
1.	11-20	24	24	06	06
2.	21-30	39	39	37	37
3.	31-40	22	22	29	29
4.	41-50	11	11	10	10
5.	51-60	3	3	6	6
6.	Above 61	1	1	12	12
	Total	100	100	100	100

Table No. 2 Different etiological factors i.e. allergens

S. No.	Different etiological factors	General population		Population in restricted premises	
		No.	%	No.	%
1.	Inhalant	58	58	40	40
2.	Ingested	9	9	11	11
3.	Infectant	6	6	10	10
4.	Contactant	4	4	13	13
5.	Drug allergy	1	1	-	-
6.	Multiple allergen	12	12	10	10
7.	Unknown	10	10	16	16
	Total	100	100	100	100

Table No. 3 Different types of symptomatology

S. No.	Symptomatology	General population		Population in restricted premises	
		No.	%	No.	%
1.	Typical tried of symptoms	61	61	45	45
2.	Predominant sneezing and rhinorrhoea	11	11	07	07
3.	Predominant rhinorrhoea and nasal obstruction	8	8	15	15
4.	Predominant sneezing and nasal obstruction	2	2	10	10
5.	Sneezing	4	4	3	3
6.	Rhinorrhoea	12	12	7	7
7.	Nasal obstruction	2	2	13	13
	Total	**100**	**100**	**100**	**100**

REFERENCES

1. Wilson KF, Spector ME, or landi RR (2011). Type of rhinitis. Otolaryngol clin north america 44. 549-559
2. Sibbald B. Eplidemology of allergic rhinitis. In Eplidemology of clinical allergy monographs in allergy, Karger. Basel 1993; 61-69
3. Sly. R. M. Changing prevalence of allergic rhinitis and asthma. Ann Allergy Asthma immunol. 1999;82;232-52
4. Lamb CE Ratner PH , johnson CE, ambegaonkar AJ Joshi AV et al (2006) Economic impact of workplace productivity losses due to Allergic rhinitis Compaced with select medical condition from an employer perspective. corr med. Res. Opin. 22;1203-1210
5. Meltzer E.O. Blaiss Ms, Derebery MJ Mohr TA Gordon BR et al (2009) Burden of Allergic rhinitis, Results from the pediatric Allergies in Amirican Survey. J. Allergy clin immunal 124;543-576
6. Bousquet J. Neukirch F, Bousquet PJ, Gehano P, Klossek JM Et al (2000) Severity and impairment of Allergic rhinitis in PT Consulting in primary core. J allergy clinic immunol 117; 158-162
7. Mullol J, Maurer M, Basgvet J (2008) Sleep and Allergic rhinitis, J investig allergol Clin Immunol 18; 415-419.
8. Bousquet J, Van Couwenherge P, Khaltaev N: ARIA Workshop Group: WHO (2001) Allegic rhinitis and it's impact on asthma: J allergy clin immunol 208; 5147-8334.
9. Dykewicz MS, Fineman S, Skoner DP. Diagnosis and Management of Rhinitis: Complete Guidelines of the Joint Task Force on Practice Parameters in Allergy, Asthma and Immunology. Ann Allergy Asthma Immunol. 1998; 81: 478-518.
10. Jonnagadala Latha, Vadde Ramakrishna George L Moses and Rallapalli Raman Janeyulu "Allergy specific immunotherapy as an effective therepy for seasonal and perinneal Allergic rhinitis patients" International Journal of microbiology vol. 2 Jan. 2011
11. Yadav SPS, Goel HC, Chandra R, Ranga R, Gupta KB. A clinical profile of allergic rhinitis in Haryana. Indian J Allergy Asthma Immunol. 2001; 15(1): 13-15.
12. R. Nepali B. Sigdel, P. Baniya Symptomatology and allergen types in Patients presenting with Allergic rhinitis Bangladesh J. otorhinolaryngology 2012; 18(1) 30-35.
13. Dold S, Wjst M, Mutius EV, Reitmeir P, Stiepel E. Genetic risk of asthma, allergic rhinitis and atopic dermatitis. Arch Dis in Child. 1992; 67: 1018-22.
14. Al Saeed et al. A sensitization of allergens among patients with allergic rhinitis in warm dry climate. Bahrain Med Bul. 2007;29(1).
15. Mc Cabe PC (Sept. 2008). Academic functioning and quality of life of children and adolescent with allergic rhinitis - Part I. Communique, 1,8-10.
16. Wu J Et al (2005) The Relationship Between Perinnel Allergic rhinitis and chronic sinusutis.
17. Naveen Kumar et al (2011). A study of eosinophil count in nasal and blood smear in allergic respiratory disease in rural setup. Internet Journal of Medical Update 2012. January2012;7(1):48-6.
18. R. Prasad, S. K. Verma, R. Dua, S. Kant et al. a study of skin sensitivity to various allergens by skin prick test in patient of nasobranchial allergy.
19. Eduardo Shahar and Margalit Lorber. Prevalence of self reported allergic conditions in an adult population in Israel IMAJ vol 3 march 2003 190-193.
20. Nabavizadeh, S. Hesamedin, Al-Yasin, Sohila. "distribution of allergans among allergic rhinitis patient living in Shiraz(Iran) region" World allergy organization journal:nov.2007 Asia pac allergy. 2012 april;2(2):93-100.
21. Crown WIt et al (2003) seasonal versus perinneal allergic rhinitis, drug and medical resource use pattern.
22 Elias Mir, C. Panjabi, A. Shah Impact of allergic rhinitis in school going children Lung india 2009 jul-sep;26(3):70-73.