



ISSN: 0975-833X

RESEARCH ARTICLE

A PROSPECTIVE EPIDEMIOLOGICAL CROSS SECTIONAL STUDY ON ALLERGIC RHINITIS  
AMONG YOUNG ADULTS IN ROHILKHAND REGION

<sup>1</sup>Mirinda, J., <sup>1</sup>Lalit, S., <sup>2,\*</sup>Himanshu, V., <sup>1</sup>Anurag, A. and <sup>1</sup>Rajeev, T.

<sup>1</sup>Department of Pulmonary Medicine, Sri Ram Murti Smarak Institute of Medical Sciences, Bareilly,  
Uttar Pradesh, India

<sup>2</sup>Department of Anaesthesiology, Sri Ram Murti Smarak Institute of Medical Sciences, Bareilly,  
Uttar Pradesh, India

ARTICLE INFO

**Article History:**

Received 29<sup>th</sup> October, 2014  
Received in revised form  
03<sup>rd</sup> November, 2014  
Accepted 16<sup>th</sup> December, 2014  
Published online 31<sup>st</sup> January, 2015

**Key words:**

Allergic rhinitis, Asthma, Rohilkhand.

ABSTRACT

Allergic rhinitis represents a considerable burden both on individual patients and society. The associated bothersome symptoms cause impairment of usual daily activities leading to absence from work and decrease in productivity, particularly among young adults. Because of the trivial symptoms, the effects and consequences of allergic rhinitis are usually under-estimated both by the patient as well as the physician. Asthma and Allergic Rhinitis (AR) are thought to be a reflection of the same disease and are often found coexistent in the same individual. We undertook an epidemiological cross sectional study to evaluate the symptomatology of allergic rhinitis, its associations and complications. The impact of allergic rhinitis on restriction of daily physical activities among the productive age group (graduate young adults) of rohilkhand region.

Copyright © 2015 Mirinda et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Allergic rhinitis is a very common disorder affecting people of all age groups. The current study is one of very few studies done in Rohilkhand region on allergic rhinitis. The present study was done with an aim to know the epidemiology of allergic rhinitis along with seasonal variation in rohilkhand region and to configure out the association of allergic rhinitis with respect to various other allergic diseases, bronchial asthma, smoking and family history, to understand the impact of allergic rhinitis on the routine activities and the amount of restriction of daily activity and also to know what medications are most preferred by affected people.

MATERIALS AND METHODS

100 graduate young adults in the age group of 20-25 yrs presenting to out patient department of pulmonary medicine, SRMS-IMS, Bareilly with symptoms of allergic rhinitis were randomly selected and included in the study. A detailed proforma was made and given to each of the patient and the data was collected. The Symptoms were included in two broad categories, Sneezing group: sneezing, running nose, itchy eyes, nose and palate and Blocker group: nasal blockade, thick mucous secretions and post nasal drip. The complications studied were eustachian tube dysfunction, otitis media and

hearing impairment. The association of allergic rhinitis with conjunctivitis, dermatitis, bronchial asthma and eczema were noted. Seasonal variation and allergy to: pollens, animal dander, house dust and foods (fish/egg/etc) were studied. Presence or absence of Family history of Smoking, Allergy, Asthma were noted. Co-existing allergic rhinitis and bronchial asthma were studied and severity of asthma - mild/moderate/severe, whether on treatment or not or any history of hospitalization was noted.

Pattern of severity as already classify by ARIA intermittent are those either having symptoms less than four days per week or symptoms present for less than four consecutive weeks. Mild are those having no features of moderate to severe allergic rhinitis. Moderate to severe are those having any of one sleep disturbance, impairment of daily activities, leisure physical activity, impairment of school or work, troublesome symptoms. Persistent are those having symptoms more than four days per week and more than four consecutive weeks (Allergic rhinitis and its impact on asthma, 2007).

The patients were asked if they self medicated themselves or consulted a specialist during a episode of allergic rhinitis. The patients were also requested to mention there most preferred medication in the event of allergic rhinitis and the effectiveness of the following remedies from most effective to least effective, using only anti-allergic drugs, using a oral drugs like Cold Act, Nozee, Dcold, using intranasal drops,

\*Corresponding author: Himanshu, V.  
Department of Anaesthesiology, Sri Ram Murti Smarak Institute of Medical  
Sciences, Bareilly, Uttar Pradesh, India.

using home remedies steam inhalation, local vaporub use, water gargle.

## DISCUSSION

Allergic rhinitis is a common disorder affecting almost all the age groups. Also allergic rhinitis represents a considerable burden both on individual patients and society. The associated bothersome symptoms cause impairment of usual daily activities leading to absence from work and decrease in productivity, particularly among young adults. Because of the trivial symptoms, the effects and consequences of allergic rhinitis are usually under-estimated both by the patient as well as the physician. Epidemiological studies obtained from different countries shows the prevalence of respiratory allergy as 15-30% (Singh and Kumar, 2003). From various studies across different parts of world, about 4% to 11% of the general population has asthma, whereas the prevalence of allergic rhinitis is around 10% to 30%. Between 20% and 50% of patients with allergic rhinitis have asthma, and 30% to 90% of patients with asthma have concomitant rhinitis.

From Table 1, we find that the sneezer group constituted 68% while blocker group was 32%. Males were more commonly affected (52%) than females (48%). In males, the ratio of sneezer : blocker group was 3.3 : 1, while in females the ratio was 1.4 : 1. Our study had more of urban patients (88%) as rural patients, even young adults were mostly illiterate or had schooling below 10<sup>th</sup> std.

From Table 2, we observe that males were most commonly affected in sneezer group (40/68 – 58.8%), while females were most commonly affected in blocker group (20/32 – 62.5%). Patients in each group had multiple complains. In the sneezer group, sneezing (60/68 – 88.2%) was most common followed by running nose (44/68 – 64.7%) and itching eyes/nose (28/68 – 41.2%). In the blocker group, nasal blockade (20/32 – 62.5%) was the most common complaint followed by thick secretions (15/32 – 46.9%) and post nasal drip (9/32 – 28.1%).

As seen from Table 3, 29 out of 52 males (55.8%) and 32 out of 48 females (66.7%) had associations with other manifestations of allergic rhinitis. Most common association of allergic rhinitis was with auditory manifestations (21/61 – 34.4%) followed by bronchial asthma (17/61 – 27.9%), conjunctivitis (12/61 – 19.7%), dermatitis (7/61 – 11.5%) and eczema (4/61 – 6.6%). Most common auditory associations were otitis media (12/21 – 57.1%) followed by Eustachian tube dysfunction (7/21 – 33.3%) and hearing loss (2/21 – 9.5%).

From the Table 4, a positive family history was present in 65.4% of males and 62.5% of females. The most common association of family history was with allergy (32%) followed by smoking (26%), asthma (15%), eczema (6%). The most common association of family history in males was with allergy (25%) followed by smoking (19.2%), asthma (13.5%), eczema (7.7%). The most common association of family history was with allergy (39.6%) followed by smoking (8.3%), asthma (10.4%), eczema (4.2%).

From Table 5, seasonal variation was present in 72% of the study group. (Males – 67.3% vs Females – 77.1%). Incidence of allergy to pollens was highest in males (28.8%) followed by animal dander (19.2%), food (egg, fish, papaya etc – 11.5%) and house dust (8.6%). In case of females, the incidence of allergy to animal dander was highest (25%) followed by pollens (18.7%), house dust (16.67%). The least incidence of allergy in case of males was to unknown substance (1.9%) while in females it was to food (6.25%). In a large online survey of 2355 individuals with allergic rhinitis, 2002 (85%) had nasal congestion. This was considered severe by 40% compared with fewer than 30% who considered any other individual allergy symptom to be severe. Nasal congestion was the symptom that most adults and children wished to prevent, and it affected most respondents at work or school, had a notable emotional impact, and interfered with their ability to perform daily activities. Only 13% of participants receiving allergic rhinitis medication of any type, including over-the-counter medications, claimed to be very satisfied with treatment, and only 20% adhered completely to prescribing instructions (Shedden, 2005).

**Table 1. Epidemiology of allergic rhinitis patients**

Group	Total(% - 100)	Male(52)	%	Female(48)	%
Sneezer Group	68 %	40	76.9 %	28	58.3%
Blocker Group	32 %	12	23.1 %	20	41.7%
Urban	88 %	47	90.4 %	41	85.4%
Rural	12 %	5	9.6 %	7	14.6%

**Table 2. Symptomatology of allergic rhinitis patients**

Group	No	Male	Female	Group	No	Male	Female
Sneezer Group	68	40	28	Blocker Group	32	12	20
Sneezing	60	28	19	Nasal Blockade	20	12	18
Running Nose	44	18	13	Thick Secretion	15	5	10
Itchy Eyes, Nose	28	7	12	Post Nasal Drip	9	2	7

**Table 3. Associations of allergic rhinitis**

Association	No	M	F	Association	No	M	F
Auditory (Total)	21	9	12	Others (Total)	40	20	20
Otitis Media	12	4	8	Conjunctivitis	12	5	7
Hearing Loss	2	1	1	Dermatitis	7	2	5
Eustachian Tube Dysfunction	7	4	3	Bronchial Asthma	17	10	7
				Eczema	4	3	1

**Table 4. Allergic rhinitis and family history**

Family history	Total(100)	%	Male (52)	%	Female (48)	%
Present	64	64%	34	65.4 %	30	62.5%
Allergy	32	32%	13	25%	19	39.6%
Smoking	14	14%	10	19.2%	4	8.3%
Asthma	12	12%	7	13.5%	5	10.4%
Eczema	6	6%	4	7.7%	2	4.2%
Absent	36	36%	18	35.6%	18	37.5%

**Table 5. Allergic rhinitis and seasonal variation**

Seasonal Variation	Total	100	Male	52	Female	48
Present	72	72%	35	67.3%	37	77.1%
Allergy To :						
Pollens	24	33.3%	15	28.8%	9	18.7%
Animal Dander	22	30.5%	10	19.2%	12	25%
House Dust	11	15.3%	3	8.6%	8	16.67%
Food	9	12.5%	6	11.5%	3	6.25%
Substance Unknown	6	8.3%	1	1.9%	5	10.4%
Absent	28	28%	17	32.7%	11	22.9%

**Table 6. Allergic rhinitis and pattern of severity (restriction of routine physical activities)**

Severity	Total (100)	%	Male (52)	%	Female (48)	%
Intermittent	21	21%	14	26.9%	7	14.5%
Mild	45	45%	27	51.9%	18	37.5%
Moderate - Severe	20	20%	6	11.5%	14	29.2%
Persistent	14	14%	5	9.6%	9	18.8%

**Table 7. Allergic rhinitis and medication history**

Medication	Total (100)	%	Male (52)	%	Female (48)	%
No Medication	34	34%	24	46.2%	10	20.8%
Self Medication	48	48%	20	38.5%	28	58.4%
Approach Specialist	18	18%	8	15.4%	10	20.8%

**Table 8. Allergic rhinitis and preferred self medication**

Self medication Remedy	Total (48)	%	Male (20)	%	Female (28)	%
Nozee, Dcold, ColdAct	24	50%	10	50%	14	50%
Oral Anti Allergic	13	27.1%	4	20%	9	32.1%
Intranasal Drops	8	16.7%	5	25%	3	10.7%
Home Remedies	3	6.2%	1	5%	2	7.1%

**Table 9. Allergic rhinitis and its association with asthma**

Asthma	Total (17)	Male(10)	On treatment	Hospital Admission	Female (7)	On Treatment	Hospital Admission
Mild	7	4	1	0	3	1	1
Moderate	5	4	3	1	1	1	1
Severe	5	2	2	2	3	3	3

In a study published in 2009, 404 patients presenting with symptoms of allergic rhinitis, who completed five patient-reported outcomes that assessed the effect of morning allergic rhinitis symptoms on patients' reports of sleep, work and activity impairment, and mood. The majority of patients had both nasal congestion and ocular symptoms at baseline. The authors concluded that, although nasal congestion is generally more strongly related to the patient-reported outcomes, ocular symptoms have a significant negative effect on patients' lives (Stull *et al.*, 2009).

In a descriptive-analytical study done at the allergy clinic of Qods hospital in Qazvin during 2007 - 2010, wherein all patients with allergic rhinitis were examined. 163 patients were included in the study. From among these patients, in addition

to rhinitis, 18 patients had asthma, 16 patients had dermatitis (atopic dermatitis and hives) and 5 patients had all three diseases. Among all these people, 57.7% were female whose average age was  $24.6 \pm 1.26$ . Reviewing skin test results showed that 69.3% of these patients had positive skin test to at least one of allergens (Manuchehr Mahram *et al.*, 2013).

Aeroallergens like pollens, fungi, body covering of animals, domestic mites and insects are the most important factors initiating allergic diseases. Pollen is the male gametophyte of seed-bearing plants resembling dust particles. One of the most obvious features of pollen allergies is their seasonal nature. Each spring, summer, and autumn, pollens are released from trees, grasses and weeds that find their way through the nose and bronchial airways. People experience allergic symptoms

only when the pollen particles are distributed in the air, and the major risk factor is family history of positive atopy. Various pollens causing allergic reactions are produced mostly by flowerless plants such as trees, grasses and weeds. Grasses are important factors for allergic reaction associated with IgE around the world. As is observed from table 6, mildly severe allergic rhinitis was most common (45%) followed by intermittent (21%) and moderate to severe allergic rhinitis (20%). In case of males, mild variety constituted the maximum (51.9%) and persistent type of allergic rhinitis was the minimum (9.6%). 78.8% of males had mild or intermittent allergic rhinitis. In case of females, the scenario was slightly different, mild allergic rhinitis was maximum with 37.5% followed by moderate to severe (29.2%) and persistent rhinitis.

A large observational cross-sectional study of allergic rhinitis patients was undertaken in May/June 2008 in four European countries and the study investigated the impact on quality of life, burden of illness and healthcare resources among 1640 allergic rhinitis patients. A total of 1009 patient records met the inclusion criteria, of whom 69% presented with both ocular and nasal symptoms. The results show that the presence of ocular symptoms reduces quality of life, reduces work productivity and increases resource utilization. Patients with nasal and ocular symptoms also record an additional half a day more time off work in the last 3 months as a result of allergic rhinitis (Virchow *et al.*, 2011).

From Table 7, most of the males (46.2%) who had allergic rhinitis preferred not to take any medication while most of the females (58.4%) self medicated themselves. 20.8% of females approached a specialist as compared to 15.4% males. As is observed from table 8, females (28/48 – 58.3%) more commonly self medicated than males (20/52 – 38.5%). Oral medications were the most preferred way of self medication among both males and females (70% and 82.1%) respectively. The most commonly used oral medications were drugs like nozee, dcold which had a combination of paracetamol, chlorpheniramine, phenylephrine (50% in both males and females) followed by oral anti-histaminics like cetirizine, levocetirizine (32.1% in females and 20% in males). Home remedies as a self medication option was least preferred both in case of males and females (5% and 7.1%) respectively.

A internet based study was done on 1000 patients in order to investigate the reported impact (influence on behavior and/or feelings) of morning symptoms on individuals with allergic rhinitis and determine their perception of the effectiveness of allergy treatment (Long, 2007). 83% reported experiencing morning symptoms of allergic rhinitis. 49% reported that their symptoms were most severe during the morning hours. The most common symptom on awakening was nasal congestion, reported by 85% of those with symptoms when they first woke up. Those with symptoms on awakening, the majority reported that these affected their feelings (96%) or behavior (87%). Among those who experienced symptoms on awakening, the majority reported that their symptoms affected the rest of their day "somewhat" or "a great deal" (51% and 24%, respectively) (Long, 2007).

Those using allergy medication, 33% reported that its effectiveness wore off before the next dose most or all of the time. A majority reported feeling that it was very important for an allergy medication to maintain effectiveness until the next dose (68%), provide relief all day and into the next morning (62%), and enable them to wake up with their symptoms under control (63%) (Long, 2007). From this large study, the following conclusions were drawn, that the morning symptoms of allergic rhinitis have a negative impact on individuals, both emotionally and in terms of disruption of daily activities. Medication used for treating allergic rhinitis was reported as not always effective for the whole time interval between doses and there is a need for medications that offer sustained effectiveness throughout the 24-hour period.

From Table 9, incidence of asthma with allergic rhinitis was 17% (17/100) and was more common in males (10/52 – 19.2%) as compared to females (7/48 – 14.6%). Overall incidence of mild asthma (7%), moderate asthma (5%), and severe asthma (5%) was found. As far as males are concerned, mild asthma constituted 7.7% (4/52) followed by moderate asthma 7.7% (4/52) and severe asthma 3.8% (2/52). Only 25% of males with mild asthma were on treatment and none required hospital admission. 75% of males with moderate asthma were on treatment and only 25% required hospital admission. 100% of males with severe asthma were on treatment and required admission.

With reference to females, severe asthma constituted 6.25% (3/48) followed by mild asthma 6.25% (3/48) and severe asthma 2.1% (1/48). Only 33% of females with mild asthma were on treatment and 33% required hospital admission. 100% of females with moderate asthma were on treatment and 100% required hospital admission. 100% of females with severe asthma were on treatment and required admission.

A recent large retrospective cohort study investigated association between physician-diagnosed AR and asthma in a large primary care population. The incidence of asthma was prospectively determined among 6491 subjects age ranging from 0 to 88 years who had AR versus did not have AR. Excluding patients who had asthma at baseline, the study found that asthma developed more frequently among patients with AR (7.6%) than those without AR (1.6%) during a median follow-up period of 8.4 years. After adjusting for effect of age at enrolment, gender, eczema and socio-economic status, AR conferred a 5-fold increased risk for asthma (Van den Nieuwenhof *et al.*, 2010).

Strong evidence is provided by an international cross-sectional study of 90 478 young adults from the USA, Europe and Australia-New Zealand which demonstrated that asthma was 7 times more frequent and bronchial hyper-reactivity (BHR) 3 times more frequent among subjects with rhinitis than those without (OR 6.63, 5.44- 8.08, and 3.02, 2.66-3.43 respectively). In the same study among a randomly selected subset of 10,210 participants, 74-81% of subjects with asthma reported rhinitis, and asthma was present among 11.9% of subjects with pollen- and animal-sensitive rhinitis versus 2.0% of those without rhinitis (Leynaert *et al.*, 2004).

A French national survey conducted among 1 906 French general practitioners reported that among 4335 asthmatic patients 55.2% had concomitant AR and that frequency and severity of AR increased with the severity of asthma (Magnan *et al.*, 2008). Among 1021 individuals enrolled as college students and followed up for 23 years AR and/or positive allergy skin tests were associated with a 3-fold increased likelihood of developing incident new asthma (Settipane *et al.*, 1994).

### Conclusion

Males were more commonly affected (52%) than females (48%). sneezer's were more commonly affected (68%). Males were most commonly affected in sneezer group (58.8%), while females were most commonly affected in blocker group (62.5%). Most common association of allergic rhinitis was with auditory manifestations (34.4%) followed by bronchial asthma (27.9%), conjunctivitis (19.7%), dermatitis (11.5%) and eczema (6.6%). Most common auditory associations were otitis media (57.1%) followed by Eustachian tube dysfunction (33.3%) and hearing loss (9.5%). A positive family history was more often present in males - 65.4% than in females - 62.5%. The most common association of family history was with allergy (32%) followed by smoking (26%). Seasonal variation was present in 72% of the study group (Males – 67.3% vs Females – 77.1%). Incidence of allergy to pollens was highest in males (28.8%) followed by animal dander (19.2%). In case of females, the incidence of allergy to animal dander was highest (25%) followed by pollens (18.7%).

Mildly severe allergic rhinitis was most common (45%) followed by intermittent (21%) and moderate to severe allergic rhinitis (20%). Incidence of asthma with allergic rhinitis was 17% and was more common in males (19.2%) as compared to females (14.6%). Overall incidence of mild asthma (7%), moderate asthma (5%), and severe asthma (5%) was found.

### REFERENCES

- Allergic rhinitis and its impact on asthma, 2007.
- Manuchehr Mahram, Ameneh Barikani, Negin Nejatian. 2013. The Frequency of Common Allergens in Allergic Rhinitis among the Patients Referred to the Allergy Clinic of Qods Hospital in Qazvin during 2007-2010. *J. Aller. Ther.*, 4:1.
- Shedden A. 2005. Impact of nasal congestion on quality of life and work productivity in allergic rhinitis: findings from a large online survey. *Treat Respir Med.*, 4(6):439-46.
- Singh, A.B. and Kumar, P. 2003. Aeroallergens in clinical practice of allergy in India. An overview. *Ann. Agric. Environ. Med.*, 10: 131-136.
- Stull, D.E., Schaefer, M., Crespi, S. and Sandor, D.W. 2009. Relative strength of relationships of nasal congestion and ocular symptoms with sleep, mood and productivity. *Curr. Med. Res. Opin.*, Jul;25(7):1785-92.

\*\*\*\*\*