

Profile of Patients with Allergic Rhinitis (AR): A Clinic Based Cross-Sectional Study from Kolkata, India

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ABSTRACT

Background: Allergic Rhinitis (AR) though quite common in India, does not receive its due importance as it deserves.

Aim of the Study: To identify the demographic and clinical profile of the patients with AR and to find the association of predominant disease symptoms with common allergens, type and severity of the disease and other co-morbidities.

Settings and Design: This clinic-based cross-sectional, observational study was conducted among adult patients presenting with signs and symptoms suggestive of AR.

Methods and Material: Consecutive 548 patients were initially screened for possible cases of AR by proper history taking and physical examination and confirmation was done by a battery of investigations, including modified skin prick test. A total of 462 patients who were finally diagnosed with AR were included in the study. Categorization of these patients was done following Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines. Pulmonary function tests and X-ray/CT-scan of the para-nasal sinuses were done to confirm the presence of bronchial asthma and sinusitis, respectively.

Statistical Analysis Used: Data were analyzed by Statistical Package for Social Scientists (SPSS version 10). Z-test was applied to compare between two rates, at 5% level of significance.

Results: Proportion of “blockers” was found to be much higher than that of “sneezers-runners” (64.1% vs. 35.9%). “Blockers” had significantly more sensitization to polyvalent house dust, house dust mites and fungi ($p < 0.05$), while, “sneezers-runners” had more sensitization to pollens ($p < 0.05$). Significantly more “blockers” had “moderate/severe persistent” and “mild persistent” types of the disease ($p < 0.05$), while “mild intermittent” and moderate/severe intermittent” type of disease were significantly more common among “sneezers-runners” ($p < 0.05$). Both bronchial asthma and sinusitis were significantly more common among the “blockers” ($p < 0.05$).

Conclusion: It can be concluded from the present study that the clinical profiles of the two main categories of AR namely “sneezers-runners” and “blockers” were distinct from each other. This knowledge can be useful to physicians at all levels for better management of patients with AR.

Keywords: Allergic Rhinitis, Sneezers-runners, Blockers, Asthma, Sinusitis, Allergens

INTRODUCTION

AR represents a global health problem. It is an extremely common disease worldwide, affecting 10 to 25% of the population [1,2-4]. However, this figure probably underestimates the prevalence of the disease, as many patients do not recognize rhinitis as a disease and therefore, do not consult a physician [1]. An increasing prevalence of AR over the last decades has been recognized [5,6]. AR has been identified as one of the top ten reasons for visits to primary care clinics [7]. Basically AR is a symptomatic disorder of the nose, induced after allergen exposure by an immunoglobulin E (IgE)-mediated inflammation of the membranes lining the nose [8]. It is characterized by nasal congestion, rhinorrhoea, sneezing, itching of nose and/or postnasal drainage [8]. Other conditions associated with AR are asthma, sinusitis, otitis media, nasal polyposis, lower respiratory tract- infection and dental malocclusion [9]. Risk factors for AR are well-identified. Indoor and outdoor allergens as well as occupational agents cause rhinitis and other allergic diseases [10].

The ARIA group in conjunction with the World Health Organization (WHO), has revised the classification of AR. The new classification includes a measurement of the frequency and duration of the symptoms and accordingly, AR is subdivided into “intermittent” or “persistent” disease and the severity of AR can be classified as “mild” or “moderate/severe” [11, 12]. “Intermittent” means that the symptoms are present less than 4 days a week or for less than 4 weeks. “Persistent” means that the symptoms are present more than 4 days a week and for more than 4 weeks. “Mild”

means that none of the following items are present namely sleep disturbance, impairment of daily activities, leisure and/or sport, impairment of school or work or troublesome symptoms, when it is called “moderate-severe”, means that one or more of the above items are present [8]. Patients with AR should also be categorized as “sneezers-runners” and “blockers”, since they have distinct clinical profiles and different treatment approach. Patients who are predominantly “sneezers and runners” often report, sneezing and anterior rhinorrhoea along with itchy nose and itchy eyes, as their main symptoms. In contrast, “blockers” are troubled by severe nasal blockage and thick nasal mucus which often leads to post nasal drip and breathlessness. The symptoms are constant, day and night, but may worsen during the night [8].

AR constitutes approximately 55% of all allergies seen in India [13]. However, in India, AR still does not receive the attention it deserves by both patients, as well as, clinicians [14]. Moreover, literature in India is scarce, regarding the clinical characteristics of the patients with AR, according to the recent classification. The present study was hence, conducted with the aim to identify the demographic and clinical profile of the patients with AR and to find the association of predominant disease symptoms with common allergens, type and severity of the disease and other co-morbidities.

MATERIALS AND METHODS

This cross-sectional, observational study was conducted among adult patients aged 20 years and above, presenting with signs and symptoms suggestive of AR at the Allergy, Asthma and Chronic

Obstructive Pulmonary Diseases (COPD) Unit at Lifestyle Clinic in Kolkata, West Bengal, India during November 2011 to October 2012. Ethical clearance was obtained from the ethics committee of Mata Gujri Memorial Medical College and L.S.K. Hospital, Kishanganj, Bihar, India. Approval to conduct the study was also obtained from the Internal Review Board of Lifestyle Clinic, Kolkata, India. Written informed consent was obtained from all the participants.

Consecutive 548 patients were initially screened for possible cases of AR by proper history taking (including personal and family history) using a pre-designed and pre-tested, structured questionnaire adopted from "standardized questionnaire proposed for patients with chronic nasal symptoms" [8]. Questions pertaining to age, sex, residence, exposure to animals and exposure to tobacco smoke and pre-dominant presenting symptoms like repeated sneezing, running nose and nasal stuffiness with frequency and duration in the past 12 months were also included in this questionnaire. These patients were then subjected to anterior and posterior rhinoscopy, modified Skin prick test with histamine and saline as positive and negative controls respectively, Enzyme- Linked Immuno-Absorbent Assay (ELISA) for specific IgE and total IgE and X-ray of the para-nasal sinuses for confirmation of the diagnosis of AR. Due to financial constraints, CT scan of the para-nasal sinuses was done only in those cases where X-ray of the para-nasal sinuses did not reveal the presence of sinusitis or where the results were equivocal. In the process, however, CT-scan of the para-nasal sinuses was done in less than 50% of the patients. Pulmonary function tests (PFT), both pre- and post-dilation, were carried out among all patients for confirming presence of bronchial asthma. Patients with deviated nasal septum, chronic rhino-sinusitis and nasal polyp, cardiovascular and other serious co-morbidities and those who were pregnant were excluded from the study. Out of the initial 548 patients, a total of 462 patients were finally diagnosed with AR and were then included in the study. The patients were classified into categories like "mild intermittent", "moderate/severe intermittent", "mild persistent" and "moderate/severe persistent" groups following ARIA guidelines [8,10] and were also categorized into "sneezers-runners" and "blockers", according to the same guidelines.

Statistical Analysis

Data were analyzed by Statistical Package for Social Scientists (SPSS version 10). Z-test was applied to compare between two rates at 5% level of significance.

RESULTS

Majority of the AR patients (33.3%) belonged to 30–39 years age group followed by 30.5% in 20–29 years age group. The proportion of females was a bit higher than that of males (57.1% vs. 42.9%). About 56% was from rural areas and rest was from urban population. It was found that 27.7% had exposure to animals while 35.7% were exposed to tobacco smoke. Simultaneous occurrence of bronchial asthma was found to be the highest (50.2%) and sinusitis co-existed in 39.8%. Among other co-morbidities, atopic dermatitis and allergic conjunctivitis were present in 22.1% and 14.9% cases, respectively. Going by pre-dominant symptoms proportion of "blockers" was found to be much higher than that of "sneezers-runners" (64.1% vs. 35.9%). While on categorizing the patients according to type and severity of disease, it was found that majority of them fell in the "moderate/severe persistent" group (32.2%) followed closely by "mild persistent" (26.0%) and "moderate/severe intermittent" (25.3%) groups. Rest of them came in the "mild intermittent" category (16.5%) [Table/Fig-1].

It was found that "blockers" had significantly more sensitization than "sneezers-runners" to polyvalent house dust, house dust mites and fungi ($p < 0.05$). On the other hand, "sneezers-runners" had more sensitization to pollens than "blockers" ($p < 0.05$) [Table/Fig-2].

"Moderate/severe persistent" variety of the disease was significantly

more common among "blockers" than among "sneezers-runners" (37.5% vs. 22.9%, $p < 0.05$). "Mild persistent" variety of the disease was also significantly more common among the "blockers" than among the "sneezers-runners" (30.1% vs. 18.7%, $p < 0.05$). On the other hand, both "mild intermittent" and moderate/severe intermittent" type of disease were significantly more common among the "sneezers-runners" than "blockers" ($p < 0.05$) [Table/Fig-3].

Both, bronchial asthma and sinusitis were significantly more common among the "blockers" than among the "sneezers-runners" ($p < 0.05$) [Table/Fig-4].

| Profile | Number (%) |
|-------------------------------------|------------|
| Age (years) | |
| 20 – 29 | 141 (30.5) |
| 30 – 39 | 154 (33.3) |
| 40 – 49 | 109 (23.6) |
| 50 – 59 | 46 (10.0) |
| ≥ 60 | 12 (2.6) |
| Sex | |
| Male | 198 (42.9) |
| Female | 264 (57.1) |
| Residence | |
| Urban | 203 (43.9) |
| Rural | 259 (56.1) |
| Exposure to animals | 128 (27.7) |
| Exposure to tobacco smoke | 165 (35.7) |
| Family history of allergy or asthma | 279 (60.4) |
| Co-morbidities* | |
| Bronchial asthma | 232 (50.2) |
| Sinusitis | 184 (39.8) |
| Atopic dermatitis | 102 (22.1) |
| Allergic Conjunctivitis | 69 (14.9) |
| Predominant symptoms | |
| Sneezers-runners | 166 (35.9) |
| Blockers | 296 (64.1) |
| Type and severity of disease | |
| Mild intermittent | 76 (16.5) |
| Moderate/severe intermittent | 117 (25.3) |
| Mild persistent | 120 (26.0) |
| Moderate/severe persistent | 149 (32.2) |

[Table/Fig-1]: Demographic and clinical profile of the patients with allergic rhinitis (n = 462). *Multiple co-morbidities present.

| Allergens | Sneezer-runners (n = 166) | Blockers (n = 296) | P value |
|-----------------------|---------------------------|--------------------|---------|
| Polyvalent house dust | 66 (39.8) | 159 (53.7) | 0.006 |
| Pollens | 128 (77.1) | 71 (24.0) | 0.000 |
| House dust mites | 27 (16.3) | 85 (28.7) | 0.004 |
| Fungi | 22 (13.2) | 116 (39.2) | 0.000 |
| Danders | 18 (10.8) | 48 (16.2) | 0.146 |
| Insects | 27 (16.3) | 62 (20.9) | 0.280 |
| Food | 30 (18.1) | 67 (22.6) | 0.307 |

[Table/Fig-2]: Common allergens among predominant symptom categories as determined by modified skin prick test*
*Sensitivity to multiple allergens present
Note: Figures in parentheses indicate percentages

| Type and severity | Sneezer-runners (n = 166) | Blockers (n = 296) | P value |
|------------------------------|---------------------------|--------------------|---------|
| Mild Intermittent | 41 (24.7) | 35 (11.8) | 0.001 |
| Moderate/severe intermittent | 56 (33.7) | 61 (20.6) | 0.003 |
| Mild persistent | 31 (18.7) | 89 (30.1) | 0.010 |
| Moderate/severe persistent | 38 (22.9) | 111 (37.5) | 0.002 |

[Table/Fig-3]: Association between predominant disease symptoms and type and severity of allergic rhinitis
Note: Figures in parentheses indicate percentages

| | Sneezer-runner (n = 166)* | Blocker (n = 296)* | p-value |
|-------------------------|------------------------------|-----------------------|---------|
| Bronchial asthma | 44 (26.5) | 188 (63.5) | 0.000 |
| Sinusitis | 55 (33.3) | 129 (43.6) | 0.038 |
| Atopic dermatitis | 39 (23.5) | 63 (21.3) | 0.704 |
| Allergic conjunctivitis | 28 (16.9) | 41 (13.9) | 0.465 |

[Table/Fig-4]: Association between predominant disease symptoms and co-morbidities

*Multiple co-morbidities was present in some subjects in both groups
Note: Figures in parentheses indicate percentages

DISCUSSION

The present study revealed that nearly half of the study subjects with AR also had coexisting asthma and this finding highlighted the importance of screening all AR patients for co-existing asthma. The finding is similar to that reported by Shah et al., (2002) [15] who observed that 55% of their study subjects had co-existing asthma. However, Sharma and Shah [16] reported that 74% of their study subjects had both asthma and AR.

It was also found, in the present study, that sinusitis co-existed in nearly 40% of the study subjects. Sahay et al., reported an even higher prevalence of sinusitis (76%) in AR patients [17]. In the present study, the proportion of “blockers” were found to be nearly 1.8 times than that of “sneezers-runners”. This finding was very similar to that observed by Sahay et al., [17]. However Shah and Pawankar found that 2/3rd of the AR patients were “sneezers-runners” [14].

Following the recent ARIA guidelines [8], it was observed in the present study, that majority of the AR patients had “moderate/severe persistent” type of disease followed closely by “mild persistent” and “moderate/severe intermittent” types, whereas, “mild intermittent” type was much less common than the other three categories. This might be due to the fact that more patients with increased severity of the disease had reported to or referred to this clinic during the study period. Alyasin and Amin in their clinic based study in Iran found that the most common category was “moderate/severe persistent” (58.3%) followed by “mild persistent” (34.4%) and “moderate severe intermittent” (4.2%) while “mild intermittent” category was the rarest (2.1%) [18]. Other studies also reported “moderate/severe persistent” as the most common form at the time of presentation [19,20]. It was observed in the present study, that “blockers” had significantly more sensitization than “sneezers-runners” to polyvalent house dust, house dust mites and fungi, while, “sneezers-runner” had more sensitization to pollens than “blockers”. A similar observation was made by Shah and Pawankar [14].

The present study revealed that significantly more “blockers” had “moderate/severe persistent” and “mild persistent” types of the disease, while “mild intermittent” and “moderate/severe intermittent” type of disease were significantly more common among the “sneezers-runners” than “blockers”. A study from South Korea also showed that, “blockers” had more “mild persistent” and “moderate/severe persistent” variety of AR, whereas, “sneezers-runners” had more “moderate/severe intermittent” and “mild intermittent” variety of AR [21].

It was also found in the present study, that the occurrence of bronchial asthma was significantly more common among the “blockers”. It was also observed that majority of these “blockers” had “persistent” type of AR, whether “mild” or “moderate/severe”. Alyasin and Amin from Iran reported that 12% of their AR patients had asthma and all of them were in “persistent group” [18].

Sinusitis was also significantly more common among the “blockers” in the present study. A similar finding was documented by Sahay et al., [17] from India and concluded that patients with AR should be categorized as “sneezers-runners” and “blockers”, since they have distinct clinical profiles and presence of sinusitis can possibly lead to sub-optimal control of AR.

The “sneezers-runners” in the present study were more sensitive to seasonal allergens like pollen, while “blockers” had more sensitivity to perennial allergens like polyvalent house dust, house dust mites and fungi, along with the observations that the former had more “intermittent” form of AR and latter suffered more from “persistent” variety, had important management implications. Based on these findings the authors agree with the suggestions made earlier by Shah and Pawankar [14], that long-term administration of oral anti-histamines along with intra-nasal corticosteroids might be useful for “sneezers-runners”, while the blockers most probably would require intra-nasal corticosteroids throughout the year.

LIMITATIONS OF THE STUDY

The main limitation of the study was that the categorization of the AR patients attending the clinic might not be true representative of that in the community. Also, financial constraints limited the scope of performing CT-scan of the para-nasal sinuses in all patients.

CONCLUSION

It can be concluded from the present study, that the clinical profiles of the two main categories of AR, namely, “sneezers-runners” and “blockers” were distinct from each other. While blockers were more sensitive to polyvalent house dust, house dust mites and fungi and had more “moderate/severe persistent” or “mild persistent” type of AR, “sneezer-runners” had more sensitivity to pollen and had more “moderate/severe intermittent” or “mild intermittent” type of the disease. Moreover, “blockers” were significantly more affected by both, asthma and sinusitis. This knowledge can be useful to physicians at all levels for better management of patients with AR.

KEY MESSAGES

- AR can be categorized into “sneezers-runners” and “blockers” had distinct clinical profiles.
- “Blockers” have significantly more sensitization to polyvalent house dust, house dust mites and fungi while, “sneezers-runners” had significantly more sensitization to pollens.
- Significantly more “blockers” had “moderate/severe persistent” and “mild persistent” types of the disease, while “mild intermittent” and “moderate/severe intermittent” type of disease were significantly more common among “sneezers-runners”.
- Both, bronchial asthma and sinusitis were significantly more common among the “blockers”

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