International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 26-01-2019; Accepted: 28-02-2019
www.medicalsciencejournal.com
Volume 5; Issue 3; March 2019; Page 137-140

Clinical assessment of patients suffering from allergic rhinitis

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Abstract
Allergic rhinitis is one of the commonest atopic diseases which contribute to significant morbidity. However it has still does not receive the attention it deserves by the patients as well as, clinicians and 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 clinical profile of the patients with AR and to find the severity of symptoms, other co-morbidities and treatment outcome.
The present study was planned on 25 patients referred to Department of ENT in Indira Gandhi Institute of Medical Sciences from July 2018 to Dec 2018. Co morbidities, associating allergic rhinitis, were examined and quality of life summarily assessed, as, subjective degree of disturbance to sleep and daily life activities. Nasal mucosa scraping was taken, from surface of middle third of inferior turbinate with wooden rhino probe and eosinophilic/basophilic infiltration was inspected, to objective ascertaining of allergic rhinitis.
Allergic rhinitis is one of the commonest immunologic diseases experienced by human. In our study we found the disease to be common in younger age group and male predominance. Majority of subject suffers from seasonal rhinitis. Incidence is more in winter because of dry and dusty in these seasons. Moderate to severe symptom were the one who comes to consult physician thus a study in general population is needed to assess the prevalence of the four ARIA ((allergic rhinitis and its impact on asthma) classifications of allergic rhinitis. There is need to mobilise health resources to manage the high burden of allergic rhinitis patients overlapping with bronchial asthma.

Keywords: allergic rhinitis, clinical profile, patients, north India, etc

Introduction
Allergic Rhinitis (AR) commonly known as hay fever, is one of the most common allergic conditions, and occurs when the nasal cavity is exposed to foreign particles such as pollens, dust, etc. The person starts sneezing or develops a running nose on breathing something which the immune system is allergic to. It is also referred to as seasonal allergies and is triggered by grass, pollen, dust and dirt in the air, and at times because of smoke and perfumes. Allergic rhinitis is not severe or fatal until accompanied by asthma or anaphylaxis, which can be significant. Drugs namely Antihistamines is used to treat this disease, and together with other drugs, they make up a fraction of over-the-counter drugs, and is prescribed every year.
Allergic rhinitis, also known as hay fever, is a type of inflammation in the nose which occurs when the immune system overreacts to allergens in the air. Signs and symptoms include a runny or stuffy nose, sneezing, red, itchy, and watery eyes, and swelling around the eyes. The fluid from the nose is usually clear. Symptom onset is often within minutes following exposure and they can affect sleep, the ability to work, and the ability to concentrate at school. Those whose symptoms are due to pollen typically develop symptoms during specific times of the year. Many people with allergic rhinitis also have asthma, allergic conjunctivitis, or atopic dermatitis [1].
Allergic rhinitis is typically triggered by environmental allergens such as pollen, pet hair, dust, or mold. Inherited genetics and environmental exposures contribute to the development of allergies. Growing up on a farm and having multiple siblings decreases the risk. The underlying mechanism involves IgE antibodies attaching to the allergen and causing the release of inflammatory chemicals such as histamine from mast cells. Diagnosis is usually based on a medical history in combination with a skin prick test or blood tests for allergen-specific IgE antibodies. These tests, however, are sometimes falsely positive. The symptoms of allergies resemble those of the common cold; however, they often last for more than two weeks and typically do not include a fever [2].
Exposure to animals in early life might reduce the risk of developing allergies to them later. A number of medications may improve symptoms including nasal steroids, antihistamines such as diphenhydramine, cromolyn sodium, and leukotriene receptor antagonists such as montelukast. Medications are, however, not sufficient or are associated with side effects in many people. Exposing people to larger and larger amounts of allergen, known as allergen immunotherapy, is often effective. The allergen may be given as injections just under the skin or as a tablet under the tongue. Treatment typically lasts three to five years after which benefits may be prolonged [3].
The characteristic symptoms of allergic rhinitis are: rhinorrhea (excess nasal secretion), itching, sneezing fits, and nasal congestion and obstruction. Characteristic physical findings include conjunctival swelling and erythema, eyelid swelling, lower eyelid venous stasis (rings under the eyes known as "allergic shiners"), swollen nasal turbinates, and middle ear effusion [4].
There can also be behavioural signs; in order to relieve the

irritation or flow of mucus, people may wipe or rub their nose with the palm of their hand in an upward motion: an action known as the "nasal salute" or the "allergic salute". This may result in a crease running across the nose (or above each nostril if only one side of the nose is wiped at a time), commonly referred to as the "transverse nasal crease", and can lead to permanent physical deformity if repeated enough [5].

People might also find that cross-reactivity occurs. For example, someone allergic to birch pollen may also find that he/she has an allergic reaction to the skin of apples or potatoes. A clear sign of this is the occurrence of an itchy throat after eating an apple or sneezing when peeling potatoes or apples. This occurs because of similarities in the proteins of the pollen and the food [6]. There are many cross-reacting substances. Hay fever is not a true fever, meaning it does not cause a core body temperature in the fever over 37.5–38.3 °C (99.5–100.9 °F).

Allergy testing may reveal the specific allergens to which an individual is sensitive. Skin testing is the most common method of allergy testing. This may include a patch test to determine if a particular substance is causing the rhinitis, or an intradermal, scratch, or other test. Less commonly, the suspected allergen is dissolved and dropped onto the lower eyelid as a means of testing for allergies. This test should be done only by a physician, since it can be harmful if done improperly. In some individuals not able to undergo skin testing (as determined by the doctor), the RAST blood test may be helpful in determining specific allergen sensitivity. Peripheral eosinophilia can be seen in differential leukocyte count. Allergy testing can either show allergies that are not actually causing symptoms or miss allergies that do cause symptoms. The intradermal allergy test is more sensitive than the skin prick test but is more often positive in people that do not have symptoms to that allergen [7].

Even if a person has negative skin-prick, intradermal and blood tests for allergies, he/she may still have allergic rhinitis, from a local allergy in the nose. This is called local allergic rhinitis. Specialized testing is necessary to diagnose local allergic rhinitis [8].

Allergic rhinitis may be seasonal or perennial. Seasonal allergic rhinitis occurs in particular during pollen seasons. It does not usually develop until after 6 years of age. Perennial allergic rhinitis occurs throughout the year. This type of allergic rhinitis is commonly seen in younger children [9].

Allergic rhinitis may also be classified as Mild-Intermittent, Moderate-Severe intermittent, mild-Persistent, and moderate-Severe Persistent. Intermittent is when the symptoms occur <4 days per week or <4 consecutive weeks. Persistent is when symptoms occur >4 days/week and >4 consecutive weeks. The symptoms are considered mild with normal sleep, no impairment of daily activities, no impairment of work or school, and if symptoms are not troublesome. Severe symptoms result in sleep disturbance, impairment of daily activities, and impairment of school or work [10].

Allergic rhinitis is one of the commonest atopic diseases which contribute to significant morbidity. However it has still does not receive the attention it deserves by the patients as well as, clinicians and 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 clinical profile of the patients with AR and to find the severity of symptoms, other co-morbidities and treatment outcome.

Methodology

The present study was planned on 25 patients referred to Department of ENT in Indira Gandhi Institute of Medical Sciences from July 2018 to Dec 2018. Co morbidities, associating allergic rhinitis, were examined and quality of life summarily assessed, as, subjective degree of disturbance to sleep and daily life activities. Nasal mucosa scraping was taken, from surface of middle third of inferior turbinate with wooden rhino probe and eosinophilic/basophilic infiltration was inspected, to objective ascertaining of allergic rhinitis [11, 12].

Cases without co-morbidity were conventionally managed, with nasal fluticasone and oral cetrizine treatment. For co-morbidities, suitable surgical care was given.

Following was the inclusion and exclusion criteria for the present study.

Inclusion criteria: 1. Patients presenting with history suggestive of AR such as rhinorrhea, sneezing, itching, and nasal obstruction

2. Patients with clinical evidence of AR such as bilateral pale ITH or AEC >350.

Exclusion criteria: 1. Patients with rhinitis of infectious origin

2. Patients with non-AR such as vasomotor rhinitis, rhinitis medicamentosa

3. Patients refusing consent for nasal biopsy

4. Atrophic rhinitis

Results & Discussion

The data from the enrolled patients were collected and presented as below.

Table 1: Age of the patients in both study groups

Age in years	Total patients
10-20	5
20-30	3
31-40	7
41-50	6
51-60	4
Total	25

Table 2: Male & Female Ratio

Gender	Total patients
Males	16
Females	9
Total	25

Table 3: Symptoms and Observed Cases

Symptom	Number of Cases
Nasal blockage	22
Running nose	17
Recurrent sneezing	15
Nasal itching	11
Eye itching/watering	10

Table 4: Co-morbidities, associated with allergic rhinitis

Co-morbidities	Number of Cases
Recurrent tonsillitis	13
Adenoid hypertrophy	11
Inferior turbinate hypertrophy	10
Nasal polyp	3
Ear discharge	6
Sinusitis	1

Allergic rhinitis is the most common immunological disease and highly prevalent chronic disease [9]. The prevalence is increasing in many western countries and disease burden is considerable with negative impacts on sleep, mood and social functioning, work or performance and health related quality of life. Allergic rhinitis is now a global health problem and can no longer be neglected by healthcare since its burden is associated with direct health resource costs and indirect socio-economic cost (e.g. absenteeism and loss of productivity) [13].

A study was conducted about the increase occurrence of allergic rhinitis in developing countries. The study states that it is difficult to get a handle on the epidemiology of allergic rhinitis and the occurrence of allergic rhinitis is increasing in areas that used to have a low prevalence, such as developing countries. The study explained that it is related to the fact that those countries are adopting more western lifestyles. "More people are moving from rural, agricultural settings, which traditionally have had lower rates of allergies, to more urban settings, which have higher levels of air pollution [14].

In India, the most common factor of allergic rhinitis are pollens of the grasses, weeds and trees. About 20%-30% of the population of India suffer from allergic rhinitis. Furthermore, there is a higher prevalence of 57% among the middle-class population as they are exposed to stress and environmental pollution more than others [15].

A study was conducted on avoidance of dust mite allergies, for controlling rhinitis among house women in USA. The study states that who purchase breathable mattress and pillowcase covers that are impermeable to dust mites, to wash bedding in hot water once a week and change the pillow case every three days showed that they could control the exposure to dust mites by 90% [16].

It has been proposed that AR and allergic asthma are manifestations of the same disease and that they represent a continuum, sharing common pathological and physiological characteristics. In this way, patients with less severe disease express only rhinitis while those with more severe disease express both rhinitis and asthma [17]. Epidemiologic studies worldwide have consistently shown that asthma and rhinitis often coexist in the same patient. Most studies on the association between rhinitis and asthma evaluate the prevalence of asthma in patients with AR [18].

AR interferes with restful sleep in several ways: evidence has shown that both symptoms and the underlining pathology can disrupt sleep. AR is not associated with sleep-disordered breathing or daytime sleepiness unless nasal obstruction/congestion are present. Sleep disturbance is a very annoying symptom. A large survey involving 2355 individuals with AR focalized on the impact of nasal congestion on patient life. More than 80% of the respondents experienced nasal congestion at night, and 17% indicated that this is the most bothersome nocturnal symptom [19]. In the study by Meltzer *et al*. [20] around 22% patients had sleep disturbances and Hadley *et al*. [21] study had 29% patients with disturbed sleep.

Mouth breathing in the infant and child is frequently secondary to chronic nasal allergy. The allergic patients are characterized by deeper palatal height, retroclined mandibular incisors, increased total anterior facial height and lower facial height, a larger gonial angle, and greater SN, palatal, and occlusal planes to mandibular plane angles. In a study by Vázquez Nava *et al*. [22], 37.2% youngsters had some kind of dental malocclusion. Of these, 42.3% had AR which was the highest contributor in the group [23]. After more than a century, the association between the obstruction of airways and dental malocclusion is still under discussion.

The greenhouse effect is an upcoming subject, increase in the fossil fuel consumption, mainly coal has increased greenhouse effect. The gases such as carbon dioxide, sulphur dioxide, methane have contributed significantly to greenhouse effect. Earth temperature has increased 1 to 2 degrees compared to pre-industrial era. Existing literature regarding pollution suggests that air pollution caused by tobacco can alter mucociliary clearance and can cause eosinophilic allergy like inflammation in the nasal mucosa. In the present era energy from the renewable sources like wind, solar, hydropower has gained importance.

To develop India, we have to burn coal and fossil fuel which are cheaper and going to increase air pollution. Renewable energy sources like wind solar hydropower is costly and India cannot afford presently. Another form a clean energy atomic energy is also costly, hence air pollution is bound to increase. More cases of allergic rhinitis and bronchial asthma are bound to occur. The incidence of allergic rhinitis and bronchial asthma is going to increase in an urban locality. Evidence has already shown that people are suffering from morbidity and mortality in cities, Bangalore and Delhi. Resources should be maximised by increasing the number of physician trained in both government and private centre to diagnose and treat allergic rhinitis [24, 25].

The prevalence of allergic rhinitis is increasing globally at a constant pace. World Health Organization (WHO) is expected to spread awareness regarding this condition especially about detection, prevention and treatment. The cost of the medications and diagnostic tools should be low so that developing countries are able to adopt the treatment methodologies. Further, additional therapies should be devised for unresponsive patients.

Conclusion

Allergic rhinitis is one of the commonest immunologic diseases experienced by human. In our study we found the disease to be common in younger age group and male predominance. Majority of subject suffers from seasonal rhinitis. Incidence is more in winter because of dry and dusty in these seasons. Moderate to severe symptom were the one who comes to consult physician thus a study in general population is needed to assess the prevalence of the four ARIA ((allergic rhinitis and its impact on asthma) classifications of allergic rhinitis. There is need to mobilise health resources to manage the high burden of allergic rhinitis patients overlapping with bronchial asthma.

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