

## A CROSS SECTIONAL STUDY OF BRONCHIAL ASTHMA IN ALLERGIC RHINITIS PATIENTS: A COMMUNITY BASED ASSESSMENTS AMONG ADULTS IN BANGALORE

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### ABSTRACT

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#### BACKGROUND

Allergic rhinitis is rather erroneously viewed as a trivial disease, it is important to note that it can significantly affect the quality of life. There is significant overlap between bronchial asthma and allergic rhinitis.

#### AIMS

This study was done to assess the prevalence of asthmatics in allergic rhinitis patients.

#### MATERIALS AND METHODS

A community based cross sectional study was conducted in Bangalore, among 1000 adults aged 30 yrs and above. Allergic rhinitis was diagnosed as per ARIA guidelines. Spirometry was done to diagnose asthma among them. Multivariate logistic regression analysis has been used to find the association of risk factors with disease.

#### RESULTS

Among subjects with allergic rhinitis, 40(33%) were also diagnosed to be suffering from concomitant asthma showing a considerable overlap between rhinitis and asthma.

#### CONCLUSION

Burden of allergic rhinitis is high with a considerable overlap with asthma. This highlights the importance of early and regular treatment.

#### KEYWORDS

Rhinitis, Bronchial Asthma, Prevalence, Allergy.

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#### INTRODUCTION

Rhinitis which occurs most commonly as allergic rhinitis is an inflammation of the nasal membranes that is characterized by sneezing and nasal congestion, nasal itching and rhinorrhea. Although allergic rhinitis is not life threatening unless accompanied by severe asthma or anaphylaxis, morbidity from this condition can be significant.

Sickness and symptoms of allergic rhinitis are sneezing, itching nose, eyes, ears and palate, rhinorrhea, post nasal drip, congestion, anosmia, headache, earache, tearing, red eyes, eyes swelling, fatigue, drowsiness and malaise. Complications of allergic rhinitis includes acute and chronic sinusitis, otitis media, sleep apnoea, dental problems such as overbite. Physical examination includes thin watery nasal secretion, deviation or perforation of the nasal septum.

According to WHO, prevalence of allergic rhinitis ranges between 10% to 32% and 10% to 40% of the allergic rhinitis patients have concomitant asthma. Laboratory tests used in

the diagnosis are allergic skin test, radioallergosorbent test, total serum IgE, total eosinophilic count. Imaging studies used in the diagnosis of allergic rhinitis includes radiography, CT, MRI.

Management of allergic rhinitis consists of the following major treatment strategies, which are environmental control measures and allergen avoidance. The avoidance of allergens includes keeping exposure of allergens, such as pollens, dust mites and mould to a minimum. And with the pharmacological management patients are often successfully treated with oral antihistaminics, decongestants or both. Regular use of intranasal steroid spray is more appropriate for patients with chronic symptoms.<sup>1,2,3,4</sup>

Immunotherapy treatment may be considered more strongly with severe disease, poor response to other management options and the presence of comorbid conditions and complications. Immunotherapy is often combined with pharmacotherapy and environmental control. Despite the high burden there is paucity of community based studies about allergic rhinitis in India, hence this study was undertaken.

#### MATERIALS AND METHODS

##### Ethics

Study protocol was approved by the institutional ethical committee. Written informed consent was taken from all participants.

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Case definition of allergic rhinitis: Subjects were considered positive for allergic rhinitis as per ARIA (allergic rhinitis and its impact on asthma) guidelines, i.e. if they had two or more symptoms out of watery running nose, nasal itching, nasal obstruction or sneezing, lasting for one hour per day, 4 days or more per week and also for 4 or more week in the past 12 months.

### Study Design and Period

A community based cross sectional study was conducted during January to December 2013 in Bangalore rural area.

### Sample Size and Sample Technique

Study sample was calculated to be 1000 adults, aged 25 and above. Multistage sampling technique was used to select the patients.

### Diagnosis of Asthma

Spirometry was used as per American Thoracic Society (ATS) and European Respiratory Society (ERS) standards in the field using portal spectrometer.

Statistical Analysis Plan: Percentages and proportions were used for category data. Chi square test was applied to find out the association of different factors in allergic rhinitis.

### RESULTS

Rhinitis was diagnosed in 100/1000 participants (10%); watery runny nose was the most common symptoms present in 90 patients (90%) followed by nasal itching (83%), nasal obstruction 72% and sneezing 33%. Rhinitis was more common in the 50 to 59 years age group (Fig 1).

Concomitant Asthma: Among subjects with allergic rhinitis 40(40%) were also diagnosed to be suffering from concomitant asthma showing a considerable overlap between rhinitis and asthma (Fig 2).

### DISCUSSION

Allergic rhinitis is a global health problem; it primarily affects the quality of life. Allergic rhinitis is considered as trivial condition, but the damage it does on work productivity is significant. Although allergic rhinitis is not a life threatening condition, complications can occur, this condition can significantly impair quality of life. The total direct and indirect cost of allergic rhinitis was recently estimated to be 5 billion per year. In 2011 analysis determined that patients with allergic rhinitis average three additional hospital visits, nine more prescriptions filled and 10 lakhs in incremental health care cost in one year than similar patients without allergic rhinitis.<sup>3,4,5</sup>

Testing for reaction to specific allergens can be helpful to confirm the diagnosis of allergic rhinitis and to determine specific allergic triggers. The most commonly used methods of determining allergy to a particular substance or allergy skin testing (Testing for immediate hypersensitivity reaction) and invitro diagnostic tests such as RAST.<sup>3,4,5</sup>

In South Indian region, prevalence of allergic rhinitis ranges from 10% to 32% in adults. There are similarities in bronchial and nasal mucosa, for this reason the pathophysiology tend to have common characteristics. All the epidemiological studies have time after time revealed that asthma and rhinitis frequently co-exists.<sup>5,6,7,8</sup> In the present study, the prevalence of asthma in rhinitis is 33%. Former

studies have shown prevalence of asthma in patients with rhinitis varies from 10% to 40%.

These patients require particular attention since co-existence of asthma needs following treatment, inhalation of bronchodilators, intravenous steroids, IV antibiotics. These asthma patients call for added hospitalization, recurrent absence from work and decline in productivity of job. Data concerning the health seeking behaviour in patients with asthma overlapping in allergic rhinitis patients is restricted. Concomitant asthma in allergic rhinitis patients consumes most of the health care resources.

Our study shows that initial treatment seeking and obedience to treatment is higher in those suffering from allergic rhinitis with concomitant asthma than patients with rhinitis, the variation was statistically noteworthy. Form the above study, it is clear patients having merely allergic rhinitis do not consult doctors and it is uncared for in the community, only when the other complication of allergic rhinitis or asthma comes patients seek doctor's advise.<sup>7,8,9</sup>

Allergic rhinitis is significantly more common in atopic individuals. We know there are different types of bronchial asthma, some of which are hereditary. Even allergic rhinitis in a first degree relative is an independent risk factor for developing allergic rhinitis. The increase in air population in 21<sup>st</sup> century can lead to greenhouse effect.

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.

All the above mentioned sources are clean. This will not produce greenhouse gases and no population, hence reduce the incidence of allergic rhinitis and bronchial asthma. The Paris conference has determined by 2050 to target the earth temperature just 1 to 2 degrees within pre-industrial era. USA, China, India are the three major greenhouse gas emitters, but the per capita emission in India is far less than many other developing countries. India is still a developing country 70% of the population live below the poverty line.<sup>3,4,5</sup>

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.<sup>10,11,12</sup>

There is complex inter relationship of different sociodemographic and environmental factors in allergic rhinitis. To increase the awareness in the community mass

campaign and mass media, such as TV, radio, newspaper has an important role. Community leaders, mahila mandals and anganwadis must also participate in community mobilization. Intensive one-to-one counselling should be done for the patients to help them avoid risk factors, exposure to dust or fumes and allergen exposure.<sup>10,11,12</sup> where the allergen can be identified.<sup>13,14,15</sup>

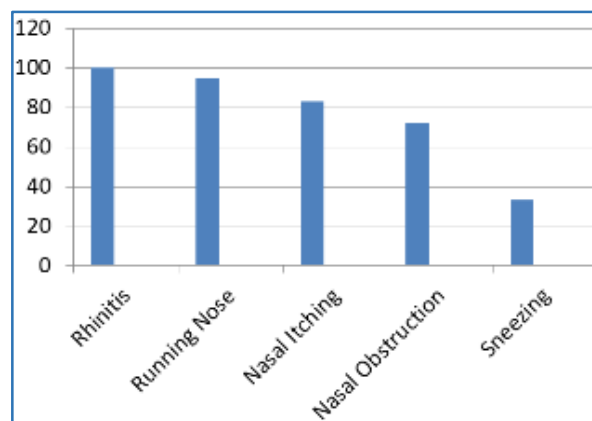
India is still developing country. We spend very little on health. India spends less than sub Saharan countries on health. We spend less than 2% of GDP to health. In the last budget, Indian government reduced 6000 crores on health. As we have shown in our study, there is increase in prevalence of allergic diseases like allergic rhinitis and bronchial asthma due to air pollution. Health care resources are not increasing commensurately with disease burden, hence there need to increase more allocation to health, need more physicians.<sup>1,3,4</sup>

### CONCLUSION

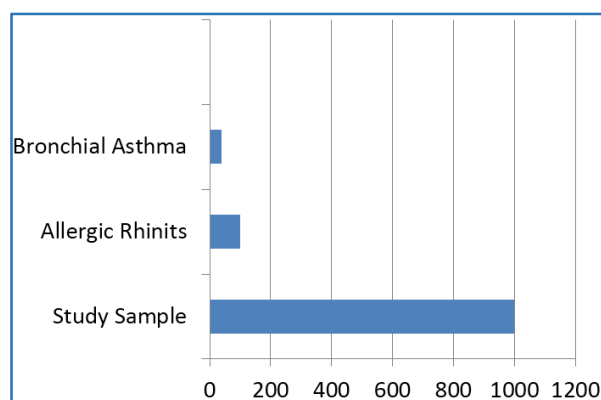
In our study, we have shown prevalence of allergic rhinitis is significantly high among general population. There is significant overlap between bronchial asthma and allergic rhinitis. There is need to mobilise health resources to manage the high burden of allergic rhinitis patients overlapping with bronchial asthma.

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**Fig. 1: Percentage of Symptoms in Allergic Rhinitis patients**



**Fig. 2: Prevalence of Bronchial Asthma and Allergic Rhinitis among study population.**