



## ASSOCIATION OF AGE GROUP AND SEASON IN RESPIRATORY ALLERGIC DISEASE

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**ABSTRACT** Allergic rhinitis and asthma are the component of respiratory allergic disease. Total IgE was measured by ELISA method. We took total 138 patients in which 75 were allergic rhinitis patients and 63 were asthma patients. Age group of (15-30 years) were most common affected with this disease during September – December season. The prevalence of cold associated with wheezing and cough both elevated up to 23.1% asthma alone and 25.7% among those with asthma and allergic rhinitis, in contrast to 2.0% and 5.8% amongst healthy individuals, respectively. Allergic rhinitis in association with asthma was once located to extend cold weather-related breathlessness even more than asthma. Thus, subjects with asthma have widespread burden of cold weather-related symptoms, and for some signs and symptoms having also allergic rhinitis rises this burden even more. However, having allergic rhinitis alone did no longer appear to have lots impact.

**KEYWORDS :** Allergic rhinitis, asthma, total IgE, Age group, cold, season.

### INTRODUCTION

Allergic diseases are common and growing gradually in both rural and urban population. They comprise a range of disorders from mild to severe, and disturb many organs. Atopy is the predisposition to produce an extravagant IgE immune response to inoffensive environmental substances. The rise in allergic disease is largely mysterious, but one widely believed hypothesis is the 'hygiene hypothesis'. The infection in adolescence helps the immune system to develop antibodies against the several allergens which cross reacts with allergens and avert the progress of allergies, and therefore we can say that allergy is the punishment for the reduced incidence of infection, resulting from enhancements in sanitation and health care<sup>[1]</sup>. Allergic rhinitis (AR) and asthma are constituent of respiratory allergic diseases.

The allergic rhinitis is most frequently found in population and makes about 55% of allergies seen in India. Rhinitis is a condition demonstrated by as following:<sup>[2]</sup>

- Nasal blockage
- Running nose (Rhinorrhea)
- Sneezing

To identify rhinitis any 2 of 3 indications mentioned above must be present for more than 1 hour per day for greater than 2 weeks.

The word asthma is a Greek word given by Hippocrates for panting. In Charak Sanhita It is termed "Tomake Swasa" which means difficulty breathing. Asthma is a frequent prolonged disease of airway inflammation that exhibits with recurrent episode of coughing, breathlessness, wheezing, and chest tightness. These events are allied with airflow obstruction that is at least partially changeable. The immunological analysis depends on IgE responses controlled by T& B lymphocytes and triggered by the contact of antigen with mast cell bound IgE molecule. Allergic asthma is a frequently seasonal and it is repeatedly found in children and adult. Majority of asthma being before the age of 25, but Asthma may be occurring at any time in life<sup>[3]</sup>.

Aetiology of asthma is difficult, various environmental, and genetic factors are involved. For diagnosis of asthma needs, a clinical assessment of patient symptoms, previous illness, physical examination, family history and diagnostic tests. Various signs, symptoms and factors which influence the course of asthma are ; history of recurrent attack of paroxysmal breathlessness, healthy interval between the attacks, family history of other allergic illness, detectable allergy to inhaled and ingested materials, whether the indications were seasonal, perennial or perennial with seasonal exacerbations, occurrence and severity of attacks with time, causing

factors, if any assumed by the patients, history of drug use particularly corticosteroids and antihistamines, whether there was any association of acute attack with infection or not and history of smoking.

In a study, 21.9% of the subjects informed minimum one of the family members had asthma<sup>[4]</sup>. Mortality rate linked with asthma is greater in women than men<sup>[5]</sup>.

Majority of allergens are probably found in household which comprises house dust mites frequently found in mattresses, pillows, carpets, animal dander of pet animals. The major outside allergens are pollens and molds. The indoor allergens are predominantly more problematic as many people spend their mostly time in the indoor activities<sup>[6]</sup>.

The basic mandatory investigations in the assessment of a respiratory allergic patient were complete blood picture with peripheral absolute eosinophil count, eosinophil percentage, total IgE levels.

### OBJECTIVE OF STUDY

To study the Association of Age group and Season in Respiratory Allergic Diseases.

### MATERIAL AND METHODS

Patients of respiratory Allergic diseases were selected from the Out Patient Department (OPD) of U.P.U.M.S., Saifai, Etawah and normal individuals among the same population from August 2017 to July 2018. The total numbers of 138 patients were included in this study. Venous blood samples were achieved from the studied patients on their hospital visit. Serum was isolated by centrifugation and analysed for concentration of total IgE. Serum level of total IgE were estimated in all samples by solid phase enzyme immunoassay for quantitative determination of total IgE. ELISA kit of XEMA Co. Ltd (Moscow, Russia) was also used as per the instructions of the manufacturer and reading was taken in AM 2100 ALERE™ Microplate Reader.

**Exclusion criteria** – Any chronic systemic disease.

**STUDY**- Cross-Sectional study.

### RESULTS

We took total 138 patients in which total Allergic rhinitis 75 and Asthma 63. Age group of patients from 05-55 years in AR and 10-60 years in Asthma. Most common age group was 15-30 years of age group, 44 patients out of 75 patients in AR affected with mean value of total IgE was about 708.6 IU/ml while in remaining patients mean level of total IgE is 494.6 IU/ml. In asthma 15-30 years of age group affected

most commonly 37 out of 63 patients of asthma affected with mean value of total IgE is 752.93 IU/ml while in remaining patients mean level of total IgE was 640.33 IU/ml.

Most commonly patients affected from September to December with 51 out of 75 patients of AR with mean value of total IgE is 693.4 IU/ml and in Asthma also during this season 31 out of 63 patients with mean value of total IgE 922.2 IU/ml.

From May to August there was 24 patients of AR with mean value of total IgE is 421.5 IU/ml and in asthma during this season 32 patients with mean value of total IgE is 463.3 IU/ml.

High level of IgE during (September-December) this season and in age group of 15-30 years suggesting the severity and vulnerability of this respiratory allergic disease.

**Table 1. mean value of total IgE in various age group of AR patients**

Age group (in years)	No. of patients	Mean level of total IgE (IU/ml)
0-15	6	627.6
16-30	44	708.6
31-45	17	447.5
46-60	8	365.75

**Table 2. mean value of total IgE in various age group of Asthma patients**

Age group (in years)	No. of patients	Mean level of total IgE (IU/ml)
0-15	6	842.25
16-30	37	752.93
31-45	11	394.26
46-60	9	685.33

**Table 3. mean value of total IgE of AR patients in different months**

Season month	No of patients	Mean level of total IgE (IU/ml)
September – December	51	693.4
May – August	24	421.5

**Table 4. mean value of total IgE of Asthma patients in different months**

Season month	No of patients	Mean level of total IgE (IU/ml)
September – December	31	922.2
May – August	32	463.3

## DISCUSSION

In our study we found that age group of 15-30 years youth/teenager population are most commonly affected with the respiratory allergic diseases in comparison to older age group/children. Table no.1 and table no.2 is showing, 44 patients out of 75 patients in AR affected with the mean value of total IgE was about 708.6 IU/ml while in remaining patients mean level of total IgE is 494.6 IU/ml. In asthma 15-30 years youth/teenager population of age group affected most commonly 37 out of 63 patients of asthma affected with mean value of total IgE is 752.93 IU/ml while in remaining patients mean level of total IgE was 640.33 IU/ml. There is marked high level of IgE was once found in that age group. More than half of the population affected is being belong to that age group.

With advancing age many modifications in the anatomy and physiology of each the upper and the lower respiratory tract are found. In nasal mucosa, enhanced dryness or slower mucociliary transport time have been defined. These age-related changes may also deteriorate itching, nasal obstruction, sneezing and rhinorrhea, which are attribute presentation of allergic rhinitis<sup>[7]</sup>.

Nasal mucociliary clearance (NMC) actually indicates an increase with the age signifying reducing function of respiratory epithelium. NMC is a chief inborn defence mechanism of the nose and paranasal sinuses whereby the mucus secreted into the upper airways by way of the goblet cells of the respiratory epithelium traps inhaled to the particulate matter, allergens, and pathogens and then it is transferred by using the ciliated cells of respiratory epithelium to the pharynx, the place it is swallowed. Enhanced NMC time, suggesting a decline in mucociliary clearance, ought to be attributed to a range of Anatomical,

Physiological, and Biochemical adjustments which take place at some stage in the normal getting old process, which may also have an effect on the response of the respiratory tract to inhaled agents<sup>[8]</sup>.

Age group of 15-30 years are most active and busy in outdoor activities. This age group also exposed to various allergens such as dust mite, pollens, smoke, air pollutants etc. Our studies also done in mainly rural population and this age group was engaged mainly in farming, labour, dairy industry, and students which are playing sports and do other outdoor activities.

Last record of the European Environment agency referred to that upto 96% of the European Union's urban populace is presently exposed to the fine particulate matter (PM) at concentrations greater than these advocated in WHO guidelines<sup>[9]</sup>.

Inhalation of PM have inflammatory outcomes on bronchial mucosa, growing the risk of asthma and the range of exacerbations in topics with the bronchial hyper reactivity<sup>[10]</sup>.

Increased industrialization and extra use of motor vehicles motives air pollution which is accountable for increasing incidence of respiratory allergic diseases. Human made air pollution, traffic associated air pollution, cigarette smoke and risky organic compounds i.e. formaldehyde, chlorofluorocarbons, fossil fuels etc. have direct destructive outcomes on respiratory tract of affected people<sup>[11]</sup>.

Studies recommend a relationship in individuals living close to to excessive traffic roads and elevated incidence for developing asthma<sup>[12]</sup>.

Table no.3 and table no.4 is showing the IgE level in various seasons.

From September to December there used to be 51 out of 75 patients of AR with imply value of total IgE was 693.4 IU/ml compared from May to August there used to be only 24 out of 75 patients with mean value of total IgE was once 421.5 IU/ml.

In asthma case from September to December there was once 31 out of 63 patients with mean value of total IgE was once 922.2 IU/ml in contrast to May to August 32 patients out of 63 with mean value of total IgE was 463.3 IU/ml. There is very excessive degree of IgE observed in asthma patients in evaluation to AR patients.

This high value of IgE observed from September to December due to the fact in this month's signs and symptoms are aggravated. In asthma instances the IgE level elevated very much in contrast to AR. This is the mix season of harvesting time and cold weather. Cold weather and the following facial and the respiratory tract cooling or inhalation of dry air frequently causes respiratory symptoms (25-29% among 25-75-year-old) in the common population and these consequences are exaggerated throughout exercise<sup>[13-14]</sup>.

The prevalence of cold associated wheezing and cough both were elevated up to 23.1% asthma alone and 25.7% among those with the asthma and allergic rhinitis, in contrast to 2.0% and 5.8% amongst healthy individuals, respectively. Allergic rhinitis in association with asthma was once observed to increase cold weather-related breathlessness even greater than asthma. Thus, subjects with asthma have enormous burden of cold weather-related symptoms, and for some signs and symptoms having additionally allergic rhinitis rises this burden even more. However, if having allergic rhinitis alone did no longer appear to have lots impact<sup>[15]</sup>.

Cold weather-related to the respiratory symptoms can be supposed to reflect purposeful changes in the airways, while inhaling cold air, taking place as a result of either cooling of skin or via the simultaneous cooling and drying of nasal and airway mucosa. Experimental studies have proven that these set off responses such as rhinorrhea and congestion in the upper airways and bronchoconstriction found in the lower airways<sup>[16,17,18]</sup>.

## CONCLUSION

Our studies find that respiratory allergic disease is common in younger age group (15-30 years) in September- December season. This population is working/student and illness of them affecting their work. So, we have to promote special precaution of that age group in mentioned season.

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