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Correlation between allergic rhinitis & asthma

J.M Phadtare*, N.N Ramraje, Sumedh Kesaria****R.R.Hegde*****

Department of Pulmonary Medicine, Grant Government Medical College, Mumbai-8

ABSTRACT:

Allergic rhinitis and asthma are both chronic disorders, with an overlapping pathophysiology and both share treatment approaches. The current study examines the interrelationship between Allergic rhinitis and Asthma and discusses the effect of treatment on these conditions. In this study 47 % subjects were male and 53% females. Youngest subject was 21 years, oldest 67 years and the mean age 35 yrs. 7% had Mild, 63% Moderate and 30% severe asthma .It was observed that 60 % of asthmatics had associated rhinitis

Keywords: *Allergic rhinitis, Bronchial Asthma*.

INTRODUCTION:

Airway allergy is now considered to be a disease not confined to a specific target organ but rather a disorder of the whole respiratory tract and there is a link between rhinitis and asthma leading to a definition of allergic rhinobronchitis or united airway disease and concept of 'one airway one disease'. Nasobronchial allergy includes diseases like allergic rhinitis and asthma .Respiratory allergy accounts for a significant burden of allergy all over the world. The prevalence of nasobronchial allergy is increasing globally as well as in India possibly due to change in environment. It has been found that over 20% of the world population suffers from immunoglobulin E (IgE) mediated allergic diseases such as asthma, rhino conjunctivitis, eczema and anaphylaxis. Both allergic rhinitis and asthma are systemic inflammatory conditions and are often co-morbidities.

Allergy is immunological hypersensitivity that can lead to a variety of different diseases via different pathological mechanisms and thus different approaches in diagnosis, therapy and prevention can be taken. An allergy is a reaction by an immune system to something that does not bother most other people.Allergic rhinitis is a symptomatic disorder of the nose induced after allergen exposure due to an IgE-mediated inflammation of the membranes lining the nose.The three cardinal symptoms in nasal reactions occurring in allergy are sneezing, nasal obstruction and mucous discharge.

METHODOLOGY

This prospective study was conducted at a pulmonary unit of a tertiary care public hospital to study allergic rhinitis in Bronchial asthma the participants of the study were adult's subjects above the age of 18 years. Before proceeding for the study, the required proforma & plan of the study were submitted to the ethics committee for research on Human subjects of the institute & were approved. In all a total number of 40 subjects were selected for the study over 2 years.

Corresponding author: R.R.Hegde

Selection of the participants:

This is a prospective study to be carried out at a tertiary centre. Patients attending the out patient department were screened for Nasobronchial allergy by history, clinical examination, chest X-ray, X-ray Para nasal sinuses,CT paranasal sinuses if required. Blood investigations such as Hemoglobin, Complete blood count, serum IgE level to rule in Atopic trait in all patients.

Patients informed written was taken and were further investigated for spirometry , forced expiratory loop and anterior Rhinomanometry . After establishing diagnosis of nasobronchial allergy patients were started on long acting β2 agonist , inhaled corticosteroids , nasal steroids and oral antihistaminics (according to allergic rhinitis and its impact on asthma guidelines and global initiative of asthma guidelines) . Follow up Forced expiratory loop and anterior Rhinomanometry were done after 3 months optimal treatment

INCLUSION CRITERIA:

- Patient with persistent rhinitis and breathlessness
- Age above 18 yrs
- Both gender

EXCLUSION CRITERIA:

- Severely ill patients
- Dyspnea due to pulmonary pathology other than asthma.
- Dyspnea due to cardiac cause.
- Non complaint patients.

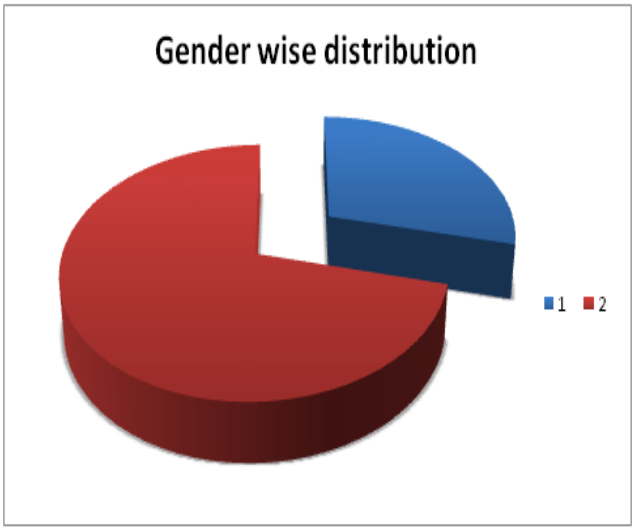
Pulmonary function tests were performed & reversibility was carried out in patients obstructive ventilatory defect by short acting B agonists. Patients were diagnosed as asthmatic on FEV1/FVC ratio < 70% and with post bronchodilator reversibility of >12% and 200 ml. Patients also underwent anterior rhinomanometry. In active ARM the measurement is done during spontaneous breathing with the patient in a sitting position. In Anterior rhinomanometry pressure difference is measured at the nostrils. The pressure flow relationship during quiet breathing is measured independently for both nasal cavities. This is a dynamic test in which pressure is recorded in one nostril while the patient breathes through the other. Flow rates were recorded at 75, 150,and 300 Pascal (Pa) from both sides of the nose and flow sums were produced from these results. It thus measures the flow and the resistance in each nose. Decongestion is then done by $\alpha_2$adrenoceptor agonists (puffs 0.14 mL of 0.1% xylometazoline or oxymetazoline) which act on nasal venous capacitance vessel and cause vasoconstriction. ARM is repeated again after 15 – 30 minutes to see the decrease in resistance and increase in flow. If decrease in resistance and increase in flow is more than 25 – 30% then the block is mucosal and not bony and the test is positive.

Patients with PFT s/o obstructive ventilatory defect with good reversibility were advised a combination of inhaled long acting β_2 agonist plus inhaled corticosteroid combination for a minimum period of 3 months & a repeat PFT was done to see the effect of treatment. Similarly in patients with rhinitis ARM was performed, patients with nasal obstruction (rhinitis) nasal steroids and oral antihistaminics (Allergic Rhinitis and its impact on asthma guidelines) were given and repeat ARM was done after a period of 3 mnths to see the effect of treatment. Patients were also advised regarding avoidance of allergens & known asthmatic triggers. Patients who had associated symptoms like recurrent rhinitis, atopy were further investigated by X ray PNS in both caldwells & waters view to look for nasal blockage, inferior turbinate hypertrophy or maxillary or frontal sinusitis. Total serum Ig E levels were also performed by CLIA method differentiates between mucosal & bony block and polyps.

RESULTS

1. Gender wise distribution of patients

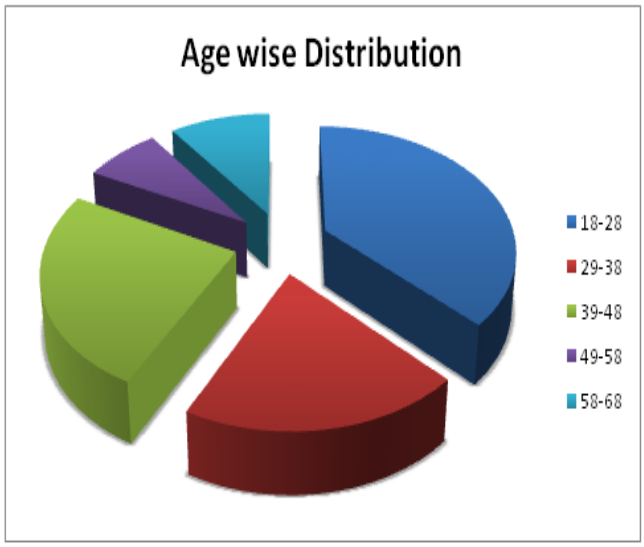
GENDER	NUMBER OF PATIENTS	PERCENTAGE (%)
MALE	19	47
FEMALE	21	53
TOTAL	40	100



In this study the population of male was 47 % and females was 53%.

2. Age-wise distribution of patients

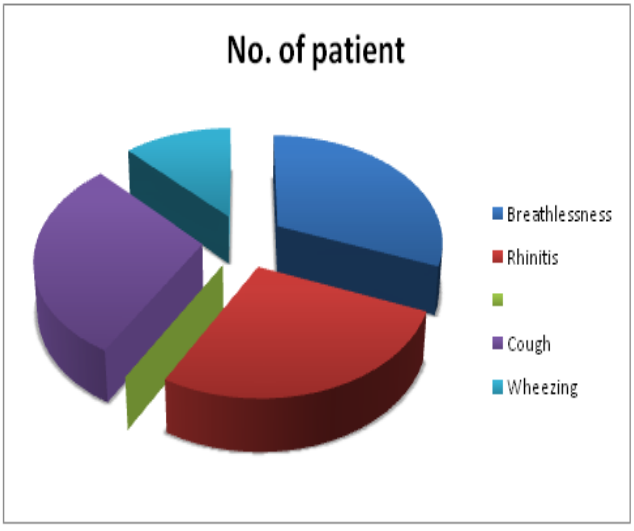
AGE GROUP (IN YRS)	NUMBER OF PATIENTS	PERCENTAGE
19-28	15	37.5
29-38	8	20
39-48	10	25
49-58	3	7.5
59-68	4	10
TOTAL	40	100



In our study the youngest subject was 21 years old and the oldest subject was 67 years old. The mean was 35 yrs

3. Symptoms wise distribution of patients

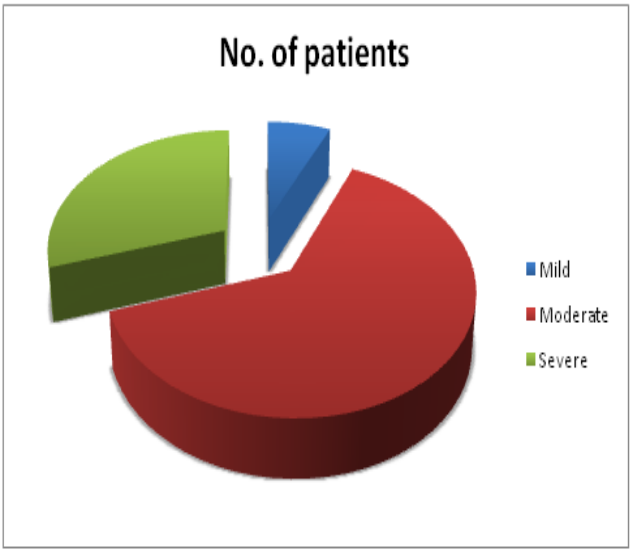
Symptom	No. of patient	Percentage
Breathlessness	23	57
Rhinitis	20	50
Cough	22	55
Wheezing	9	22



57% of the patients had breathlessness,55% of the patients had cough, 50 % had rhinitis and 22 % had wheezing. Thus breathlessness, rhinitis and cough were the commonest presentations in asthmatic patients.

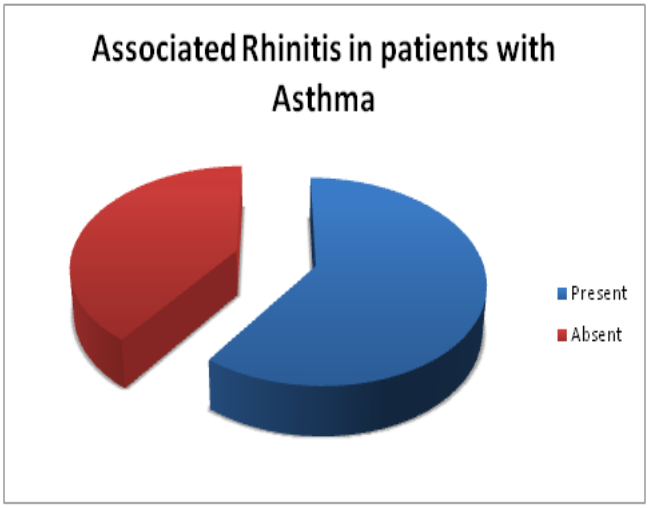
4. Severity of Asthma

Severity of Asthma	No. of patients	%
Mild	3	7
Moderate	25	63
Severe	12	30
Total	40	100



5. Presence of associated Rhinitis in Asthmatic patients.

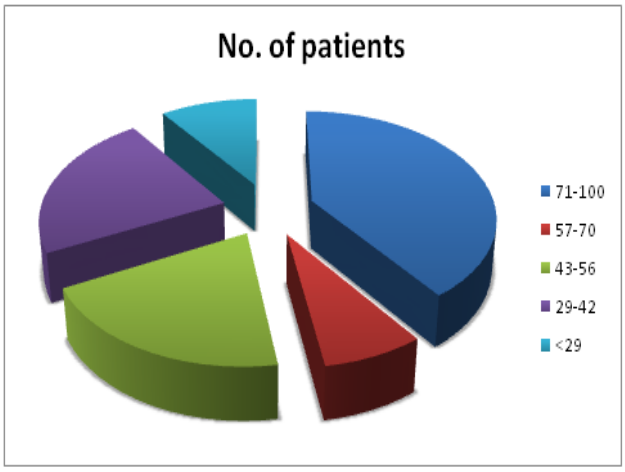
	No. of patients with Asthma	Percentage
Present	18	60
Absent	12	40
Total	30	100



In our study 60 % of asthmatics had associated rhinitis.

6. Severity of Nasal obstruction based on Anterior Rhinomanometry.

PERCENTAGE OF PREDICTED NASAL FLOW	No. of patients	Percentage
71-100	16	40
57-70	3	7.5
43-56	8	20
29-42	9	22.5
<29	4	10
Total	40	100



1. Effects of treatment on FEV_1 % pred. Levels

	MEAN	STD DEV.	T VALUE	DF	SIGNIFICANCE
FEV_1 (%)	68.9				
POST FEV_1 (%)	77.9				
Difference in post and pre FEV1 (%)	14	22	3.18	39	<0.01

Paired t test was used to evaluate the significance of improvement in fev_1, p value was <0.01 i.e. there was significant improvement.

8. Effects of treatment on flow of arm in patients

	MEAN	STD DEV	T VALUE	DF	SIGNIFICANCE
Flow (ml/s)	171				
POST Flow (ml/s)	205				
Diff in flow after treatment	34.2	95	2.07	39	0.015

Paired t test was used to evaluate the significance of improvement in Flow of ARM , p value <0.01 i.e. there was significant improvement.

9. Effects of treatment on resistance of ARM in patients

	MEAN	STD DEV	T VALUE	DF	SIGNIFICANCE
Resistance (kpas/L)	62				
POST Resistance (kpas/L)	51				
Diff in Resistance after treatment	12	95	4.5	39	0.02

Paired t test was used to evaluate the significance of decrease in Resistance of ARM, p value <0.01 i.e. there was significant decrease

DISCUSSION

Around 300 million people in the world are suffering from bronchial asthma. Pulmonary function tests are one of the important tools in diagnosing asthma, to assess the degree of responsiveness and gradation of asthmatics, to assess the response to asthma therapy and tailor the therapeutic regimen accordingly.

The purpose of this study was to assess occurrence of Allergic rhinitis in asthmatics and to see the effects of treatment.

In our study, patients attending outpatient department of pulmonary unit of a tertiary care public hospital with respiratory complaints were screened by symptomatology, history, clinical examination, spirometry, serum IgE levels, X-ray chest, X-ray PNS, and anterior rhinomanometry tests were performed in 40 patients over a period of 2 years.

In our study, the minimum age was 21 years and the maximum age was 67 year. and the mean age was 35 yrs. The population of male patients was 47% and female patients were 53% thus showing a slightly higher prevalence of asthma in females.

57% had breathlessness, 55% of the patients had cough,50% had rhinitis and 22 % had wheezing. Thus breathlessness,cough and rhinitis were the commonest symptoms.

In our study 60 % of the asthmatics had associated rhinitis, the results are comparable to earlier study conducted by H. Kim , J Bouchard and PM Renzix (1) in 2008 which showed 30 – 80% of all asthmatic had allergic rhinitis , in other study conducted by M Zdraveska, D Dimitrievska , D Todevski, A Gjorcev , E Janeva, I Pavlovska and B Zafirova-lvanovska(2) in march 2015 which showed 72.5 % , in study conducted by Navarro A, Valero A, Julia B, Quirce S(3) which showed as 89.5 % and by Leynaert B., Neukrich C et al in 2004 (4) in which they showed 75-80 % of all asthmatics had rhinosinusitis.

There was significant improvement observed in FEV_1 after 3 months of effective treatment by paired t test. ($p< 0.01$)

Paired t test was also used to observe significant improvements in flow of ARM ($p<0.05$) after 3 months of treatment.These observations were comparable with studies made by Dora Kiss, MD; Wolfgang Popp, MD; Friedrich Horak, MD;Christian Wagner, MD; and Hartmut Zwick, MD(5)

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