

A CORRELATION STUDY OF SEROLOGY AND HISTOPATHOLOGY IN ALLERGIC RHINO - SINUSITIS

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ABSTRACT

Aim Of Study : To correlate Serum Total Ig-E, Absolute Eosinophil Count (AEC) and eosinophils in nasal and pharyngeal smear in the patients with allergic rhino-sinusitis.

Objectives:

- To determine the serum total Ig-E level in patients with Allergic Rhino-sinusitis
- To determine the absolute eosinophil count (AEC) in patients with Allergic Rhino- sinusitis
- To study eosinophils in Nasal and pharyngeal smear in the patients with Allergic Rhino-sinusitis
- To correlate all the above three parameters in patients with Allergic Rhinosinusitis

Results : The mean age was 30.63 ± 10.08 years consisting of 42 females and 38 males. In majority of the subjects the signs and symptoms were sneezing, rhinorrhea, nasal blockage and itching of the ear. Among the 80 subjects 19 of them had deviated nasal septum and hypertrophy of turbinate's. Half of the subjects reported secretions in the nasal cavity.

1. In the study the mean Ig E levels was 560.58 ± 361.74 (UI/l).

2. Mean absolute eosinophil count was 558.46 ± 459.28 (cells/mcL).

3. Smear for eosinophil was positive in only 4 subjects.

There was no statistical difference when the IgE levels were compared with the smear. All the four patients with smear positive for eosinophil had elevated AEC which statistically significant ($p=0.01$). a moderately strong positive correlation was seen between Ig E levels and eosinophil count.

Conclusion: Both NSE and Ig-E had strong relationships with the disease's severity. A straightforward procedure with a strong association to the severity of the clinical score is nasal smear cytology, which should be utilized frequently. Measuring serum Ig E levels will improve diagnostic value, increase the accuracy

KEYWORDS

Total Ig-E, Absolute Eosinophil Count (AEC), Eosinophils in Nasal and pharyngeal smear in the patients with allergic rhino-sinusitis.

INTRODUCTION

Allergic Rhinitis is a global health problem, which results in significant disability worldwide. It cuts across all ages, ethnic groups, socioeconomic status, and countries, estimated to affect about 10 – 25% of World population.

Allergic rhinitis, although being a common disease with a prevalence of 3.5% in India. It is an inflammatory disorder of the nasal mucosa induced by allergen exposure which triggers Ig-E mediated inflammation. Sneezing, itching, watery nasal discharge, and a sense of nasal blockage are all symptoms of allergic rhinitis, an immunoglobulin E (IgE) mediated hypersensitivity illness of the mucous membrane of the nasal airway.

Both absolute eosinophil count and serum Ig-E are a part of basic investigation panel for allergies and are known to be positively related with it. They provide evidence for the presence of allergy.

Nasal smear cytology for eosinophils is an objective investigation, which involves the laboratory preparation and subsequent analyses of nasal scrapings from the inferior turbinate with the aim of determining the eosinophil count and categorizing such patients based on the amount seen microscopically.

PATIENTS AND METHODS

Study Period: Over a period of 18 months from January 2021 to July 2022.

Sample Size: 80 patients

Study Design: Observational Descriptive study

Study Place: Tertiary Care Hospital in Telangana

Inclusion Criteria

- Patients of either sex aged between 10 to 60 years.
- Patients with seasonal Allergic Rhinitis diagnosed by Allergic Rhinitis questionnaire (ARIA guidelines)
- Patients with Allergic Rhinosinusitis
- Patients with polyps
- Patients with history of Bronchial asthma with the above symptoms

Exclusion Criteria

- Patients with Rhinitis medicamentosa and other forms of Rhinosinusitis in which allergy is not involved
- Patients below 10 years and above 60 years of age
- Patients prior H/O anti allergic treatment at the beginning of the study
- Pregnant and Lactating mothers
- Patients with carcinoma of Nose and paranasal sinuses

METHODOLOGY

- Detailed History

Clinical examination including

- Anterior Rhinoscopy
- Diagnostic Nasal Endoscopy

Investigations

- Total and Differential count
- Serum Ig-E
- Absolute Eosinophil Count
- Nasal and pharyngeal swab for Eosinophilia

RESULTS

Table 1: Age Distribution

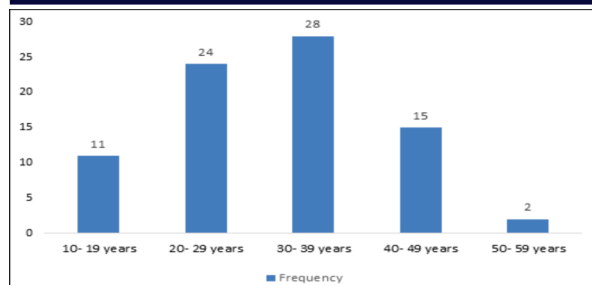
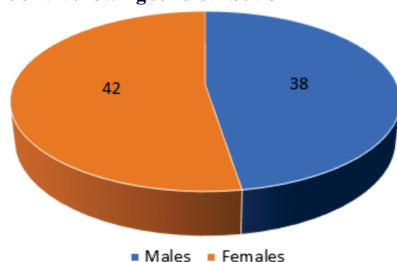


Table 2 : Pie chart showing sex distribution



- The study consisted of 47.5% males and 52.5% females with the sex ratio being 0.92:1 [M:F] as seen in Pie chart above

Table 3 : Serum Ig-E and AEC Levels:

Variable	Mean± SD
IgE (UI/ml)	560.58± 361.74
Absolute eosinophil count (AEC) (cells/mcL)	558.46± 459.28

Table 4 : Distribution according to Smear for Eosinophil findings

Smear	Frequency	Percent
Positive	4	5%
Negative	76	95%
Total	80	100%

Table 5: Comparison between Serological and Histopathological tests

Smear for eosinophil	IgE (UI/ml)	n	Mean	SD	95% CI		p-Value
					Lower	Upper	
	<150	20	78.52	41.88	1.84	2.05	<0.94
	150- 1000	58	708.43	6.36	1.89	2.007	<0.76
	>1000	2	1093.5	6.36	2	2	<0.91

*Level of significance: p<0.05

Table 6: Comparison between AEC and Smear for Eosinophils

AEC	Smear for eosinophil	n	Mean	SD	95% CI		p-value
					Lower	Upper	
	Positive	4	1308	969.99	351.71	1226.25	0.01*
	Negative	76	519.01	391.17	746.37	2324.34	0.20

*Level of significance: p<0.05

Table 7: Correlation between Serological tests Correlations

Variables	Mean	SD
IgE levels	560.58	361.74
AEC	558.46	459.28

Table 8 : Correlations

		IgE levels	AEC
IgE levels	Pearson Correlation	1	0.069*
	Sig. (2-tailed)		.545
	N	80	80
AEC	Pearson Correlation	0.069*	1
	Sig. (2-tailed)	.545	
	N	80	80

Manuprita S et al. in 2019 retrospectively conducted a study with the aim to determine serum Ig-E and eosinophil levels in patients with allergic rhinitis and healthy controls, men and women, different age groups and to establish a correlation between serum Ig-E and eosinophil. The study concluded estimation of serum Ig-E and eosinophil can serve as a simple, non-invasive and reliable investigative tool in the diagnosis of allergic rhinitis[1]. The normal absolute eosinophil count is taken as 40-450 cells/mm³[2]

DISCUSSION

- Allergic rhinitis is a common allergic disease with increasing

prevalence generally developing during childhood and particularly affecting teenagers and young adults.

- The other studies reported a mean age of 32.21 years which was close enough to the present study with the mean age of 30.63 years. Our study consisted of 47.5% males and 52.5% females; other studies showed male predominance.
- Variations in the upper limit of normal total serum Ig-E have been reported to be 150–1000 IU/ml, but the usually accepted upper limit is 150–300 IU/ml.
- This variation is also seen in the present study. The mean IGE was 814.36 IU/ML in the other studies, whereas in this study the mean IGE was 560.58± 361.74.
- The study also reported increased AEC levels which was also a similar finding.
- The present study showed IGE levels was not significant and the AEC was significant on comparison with smear for eosinophilia.
- The other study also had similar findings with regard to absolute eosinophil count and contrary results with regard to IgE levels.
- The present study findings showed a moderately strong correlation between IgE and eosinophil and the other study reported a weak positive correlation.
- The study was consistent with other studies which also showed increased IgE levels and Eosinophil levels.
- On comparison the study showed no significant difference which is partially similar to the present study
- The present study findings were concurrent with a study by Tegnoor MS et al in which Ig-E levels and eosinophil count were increased among patients with allergic rhinitis across different age groups and gender[3]
- The present study findings were comparable to a study by Paula Couto TA et al in which mean Ig-E levels were raised among patients with allergic rhinitis and they were significantly higher among males as compared to females[4]
- The present study findings were similar to a study by Barkhas SA et al in which a significantly (P<0.001) elevated mean serum total IgE (271.46 ± 13.96 IU /ml) and eosinophil counts percentage (4.48 ± 0.14 %) was observed in patients with allergic rhinitis as compared with controls [5]
- The present study findings were like a study by Corsico AG et al in which serum IgE levels were higher among patients with allergic rhinitis and the mean value increased with increase in the degree of allergic rhinitis [6]

CONCLUSION

- This study was conducted to find out the correlation between serology and histopathology in patients with Allergic Rhinosinusitis.
- The study reported most of the patients had upper limit Ig-E levels and 40% had elevated AEC.
- A Moderately positive correlation and association was obtained with regard to serological tests (Serum Ig-E & Serum AEC) and there was no association between serum Ig-E levels and Histology (Smear for Eosinophilia)

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