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Original Research Article.

Impact of Serum Total IgE and Disease Severity in Patients with Allergic Asthma: NIDCH in Dhaka

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ABSTRACT

Objective: In this study our main aim is to evaluate impact of Serum Total IgE and Disease Severity in Patients with Allergic Asthma.

Method: This cross-sectional study was conducted at NIDCH, Mohakhali, Dhaka from one year (July 2012 - June2013). Among 150 asthma patients, 50 mild asthma patients, 50 moderate and 50 severe asthma were selected in this study.

Result: In our study among 150 patients, patients with mid asthma belong to 15-19 years age group, where as patients with moderate asthma and severe asthma belong to 25-29 years and 35-39 years age group.21% patients with mild asthma unusually visit for regular checkup to doctor whereas 48% patients with moderate asthma unusually visit regularly to doctor.47% patients with severe asthma level had >400 IU/mL serum level where as 19% patients with moderate asthma had >400 IU/mL serum level.

Conclusion: From our study we can conclude that, serum total IgE levels in adult patients with persistent allergic asthma from Bangladesh were high (two-thirds with levels >150 IU/mL) and varied significantly. Further study is highly appreciated for better outcome.

Keywords: Serum Total IgE, Allergic Asthma.

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INTRODUCTION

Usually, the concept of allergy implied an abnormal response to an otherwise benign agent with an easily recognizable relationship between exposure and disease. Though, there are syndromes in which the relationship between exposure to the relevant allergen and the "allergic" disease is not clear. In these cases, the incidence of specific IgE antibodies can play asignificant role in classifying the relevant allergen and provide a guide to therapy. Decent examples include chronic asthma and exposure to perennial indoor allergens and asthma related to fungal infection.

A total serum IgE level greater than 200 IU/mL in individuals with family history of autopsy suggests possible development of allergic disease in the future.[1,2] However, other factors have an impact on total IgE levels, as IgE is not only an appearance of autopsy, but it can also specify chronic parasitic infection, particularly by geohelminths, which stimulate the creation of polyclonal IgE.[3,4] Furthermore, it has been detected that polyclonal IgE synthesis by intestinal helminths may reduce allergic reactivity in populations with high rates of parasitic infection, representing one possible explanation to the hygiene hypothesis in allergic diseases. Improved level of total IgE levels in a patient with respiratory allergy can be predisposed by intestinal parasites.

In our study our main objective is to evaluate impact of Serum Total IgE and Disease Severity in Patients with Allergic Asthma.

OBJECTIVES

General Objective

- To assess impact of Serum Total IgE and Disease Severity in Patients with Allergic Asthma.

Specific Objective

- To detect serum total IgE Levels according to asthma severity.
- To identify clinical characteristics of the patients

METHODOLOGY

Type of Study

Hospital based cross sectional comparative study.

Place of Study

NIDCH, Mohakhali, Dhaka.

Study Period

One year (January 2017 – January 2018)

Study Population

A total of 150 patients were admitted in NIDCH, Mohakhali, Dhaka. Out of 150 asthma patients 50 mild asthma patients, 50 moderate and 50 severe asthma were selected

Sampling Technique

Purposive

Inclusion Criteria

- 15-≥40 years age people
- Both male and female

Exclusion criteria

- Not more than 80 years old patients

Method

Relevant information included demographics, medical history, symptoms, health resource utilization due to asthma within the previous year, spirometry results, serum total IgE levels, specific IgE levels, skin prick test results, and current asthma treatments

Data Collection and Analysis

Data will be collection in predesigned data collection sheet using various parameters. Interviews conducted using direct questionnaire and all information will be noted in pre from data collection sheet. Data were compiled and appropriate statistical package for social science (SPSS). Qualitative data are summarized by ratio and percentage. Qualitative data are concise by mean and standard deviation (SD). Chi square (X^2) and Unpaired t-test were used to assess the significance of Quantitative data respectively.

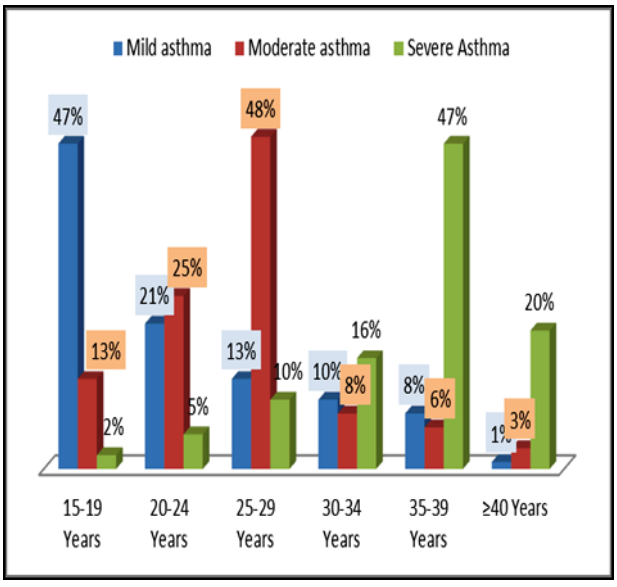

Figure 1: Age distribution of the patients.

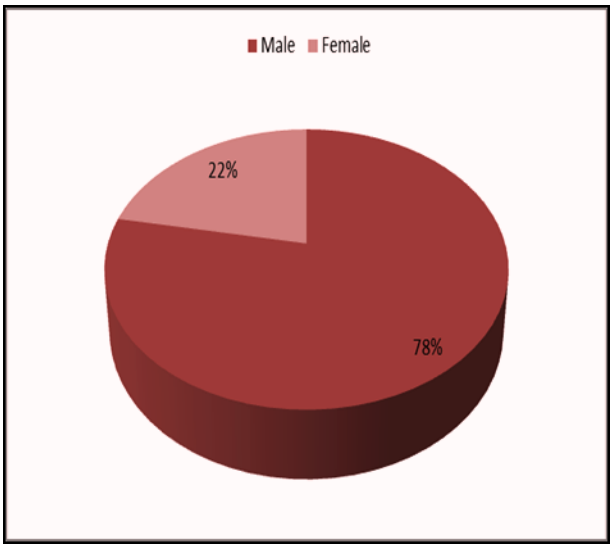

Figure 2: Gender distribution of the patients.

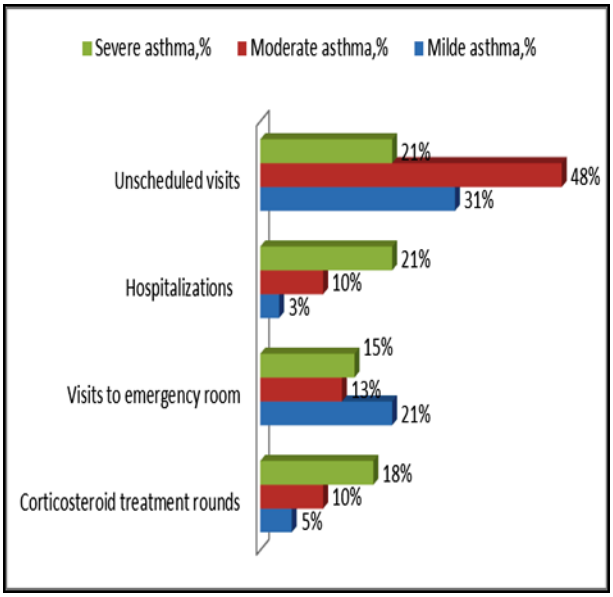

Figure 3: Distribution of the patients according to utilizing health resource due to asthma

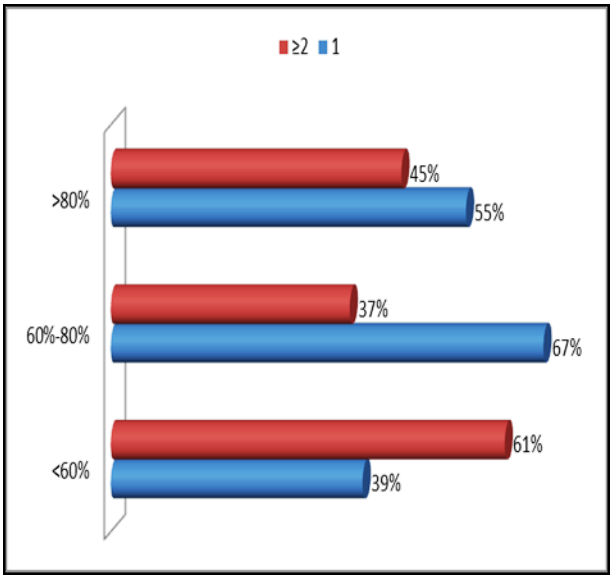

Figure 4: Distribution of serum total IgE levels according to pulmonary function as measured by FEV1.

Table 1: Demographic profile of the patients

Socio-demographic variables		Mild asthma (n = 50)	Moderate asthma (n = 50)	Severe asthma (n = 50)
Community	**Muslim**	74.0	60.0	67.0
	Hindu	20.0	30.0	25.0
	Buddhist	6.0	10.0	8.0
Habitat	**Urban**	32.0	64.0	48.0
	Rural	50.0	30.0	40.0
	Slum	18.0	6.0	12.0
Occupation	**House Wife**	36.0	26.0	21.0
	Service Holder	24.0	24.0	19.0
	Student	32.0	30%	38.0
	Businessman	8.0	20%	22.0
Educational Status	**Illiterate**	24.0	4.0	14.0
	Primary	32.0	16.0	29.0
	Secondary	34.0	66.0	50.0
	Higher Secondary & Above	10.0	14.0	7.0

Table 2: Clinical characteristics of the patients

Clinical characteristics of the patients		Mild asthma A (n = 50)	Moderate asthma (n = 50)	Severe asthma (n=50)
		%	%	%
Family history of asthma	**Yes**	74.0	70.0	76.0
	No	26.0	30.0	25.0
Number of allergens	**1**	48.0	64.0	48.0
	≥2	52.0	36.0	52.0
FVC	**60%**	76.0	70.0	71.0
	60-80%	10	14.0	19.0
	≥80%	14.0	26.0	10.0

Table 3: Distributions serum total IgE Levels according to asthma severity

Serum total IgE, IU/mL	Mild,%	Moderate ,%	Severity,%
<150 IU/mL	35%	44%	21%
150-400 IU/mL	39%	37%	32%
>400 IU/mL	26%	19%	47%

RESULTS

In figure-1 shows age distribution of the patients where most of the patients with mid asthma belong to 15-19 years age group, whereas patients with moderate asthma and severe asthma belong to 25-29 years and 35-39 years age group.

In figure-2 shows gender distribution of the patients where 78% patients were female, 22% patients were male.

In table-1 shows demographic profile of the patients where in mild asthma group 50% patients belong from rural where as in moderate asthma group only 30% patients belong from rural.

In table-2 shows clinical characteristics of the patients where in mild, moderate and severe asthma group patients, most of the patients had family history of asthma.

In figure-3 shows distribution of the patients according to health resource due to asthma where 21% patients with mild asthma unusually visit for regular checkup to doctor whereas 48% patients with moderate asthma unusually visit regularly to doctor.

In table-3 shows distributions serum total IgE Levels according to asthma severity where 47% patients with severe asthma level had >400 IU/mL srum level where as 19% patients with moderate asthma had >400 IU/mL serum level.

In figure-4 shows distribution of serum total IgE levels according to pulmonary function as measured by forced expiratory volume in 1 second (FEV1). Although a trend towards higher levels was observed in patients with an FEV1 <60% for patients <60, the differences were not statistically significant (P=.252).

DISCUSSION

In our study, we found wide variability between the 3 subgroups, suggesting that IgE is subject to intrinsic variability, which is not necessarily asthma-related. These major interpatient differences had already been described[5], as had wide intrapatient variability over time.[6] Although we did not find a significant association between total IgE and the 3 stages of asthma severity, a higher percentage of patients with IgE>400 IU/mL was observed in patients with severe asthma. Thus, our results indicate that a cut point of 400 IU/mL could be predictive of more severe, difficult-to-treat asthma.

When we reconnoitered factors related with IgE levels in these patients, we were not able to explain much of the observed variability. Though a trend towards higher levels was observed in patients living in inland regions with ≥2 exacerbations in the

previous year and a family history of asthma, none of these variables remained important in the multivariate examination.

The only 3 independent predictors of higher levels of IgE were younger age (especially in patients with a family history of asthma), reactivity to ≥1 allergen, and female gender. These 3 variables had been reported elsewhere.[7,8]

One study found that high levels of total IgE were associated more with moderate and severe asthma (subjectively categorized), especially in younger patients and in adults whose asthma began in childhood.[8] The relationship with younger age in patients with a family history of asthma suggests that increased IgE level is partly genetically determined and that in patients with inherited susceptibility to asthma, levels decrease increasingly with age, perhaps owing to the confounding effect of diminished allergic sensitization, one of the key factors that influence IgE levels and whose prevalence clearly decreases with age.

CONCLUSION

From our study we can conclude that, serum total IgE levels in adult patients with persistent allergic asthma from Bangladesh were high (two-thirds with levels >150 IU/mL) and varied significantly. Further study is highly appreciated for better outcome.

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