

Study of IgE in Bronchial Asthma patients

By

Dr Mohammad Salahuddin¹ Makandar UK²

1. Associate Professor Department of Physiology College of Medicine Jouf University, KSA.
2. Professor in Anatomy Vedanta Institute of Medical sciences palgrah-Dahanu (Maharashtra)

Abstract

Background: Immunoglobulin E has a central contributing factor. The higher levels of IgE indicate the severity of Bronchial asthma. Moreover spirometry is the ideal for the diagnosis by asthma forced expiratory volume in one second (FEV₁) from spirometry is reliable for diagnosing air flow obstruction.

Methods: 85 adult aged between 18 to 55 were studied. Blood exam CBC, ESR, ECG, Sputum for AFB chest- x ray Gram is staining was done. Spirometry was recorded in each patient's IgE was estimated in quantine IgE, turbimetric Immunoassay Results of spirometry were compared with levels of IgE also studied at different age group.

Results: The symptoms were 40 (47%) dyspnoea, 28 (32.9%), 17 (20%) wheezing, 12 (14.1%) had 100-200 IgE, 15 (17.6%) had 201 to 300 IgE, 24 were had 301to 400 IgE, 37 (43.5%) had 401-500 IgE, 24 were aged between 21-30 years had mean level of 368 IgE. 16 were aged between 31-40 had mean level of 384 IgE, 32 were 41-50 years old had 369 IgE, 13 were aged between 51-55 had 388.6 IgE level.

Conclusion: This study of IgE and spirometric will be helpful to diagnose the severity of bronchial asthma, because exact mechanism or patho-physiology of bronchial asthma is still un-clear.

Keywords: Spirometry, FEV₁ Quantina IgE, turbimetric, immunoassay.

Address of the Author

Dr. Mohammad Salauddin MBBS, MD

Near College of Medicine,

Faisaliyah Building No – 2907,

King Khaled Street, Sakaka Aljoug KSA

Email: mdsalah2@gmail.com

Cell No: +966 502905687

Introduction

Bronchial asthma is an allergic respiratory disorder which is a global phenomenon Allergic disease including asthma are characterized by an increase of serum Immunoglobulin E (IgE) levels by immunologic mechanisms mediated by IgE antibodies occurs in allergic asthma

⁽¹⁾⁽²⁾⁽³⁾. IgE plays a central role in the initiation and propagation of the inflammatory cascade and thus the allergic responses ⁽⁴⁾⁽⁵⁾. Induced, recent studies reveal that IgE through its affinity IgE, receptors (FC epsilon R₁), is the critical regulator of TH₂ responses. Since the time of its discovery in 1966, IgE has been considered the most important biological target in the treatment of allergy and asthma. This is supported by success of the anti IgE monoclonal antibody (mAb) in the treatment of allergy and asthma. Although therapy is extremely high cost but maintain the effectiveness ⁽⁶⁾⁽⁷⁾⁽⁸⁾.

Hence, without separating asthma patients whose disease is largely dependent on the allergic response from those whose asthma also may result from other factors such as an anti-viral reaction, it may be impossible to discern the drug's true effectiveness on allergy-triggered asthma ⁽⁹⁾⁽¹⁰⁾⁽¹¹⁾. We undertook this study to estimate and compare serum IgE levels in mild, moderate, and severe asthmatics and in normal subjects and to obtain a mathematical model describing the relationship between serum IgE levels and severity of asthma.

Material and Method

85 adult patients aged between 18 to 55 years visiting to Medicine department for the treatment of Bronchial asthma to GMC and Hospital Aurangabad (MS) were studied.

Inclusive Criteria: patients having symptoms of bronchial Asthma, i.e. breathlessness. Cough chest tightness and wheezing were included in the study.

Exclusion Criteria: The patients below 18 years, smokers, COPD, pulmonary tuberculosis (PT). Immune compromised patients were excluded from the study.

Method: Detailed history of each patient was noted (duration of asthma, frequency, severity of exacerbation, smoking history, family history, profession exposure to dust or smoke) chest-x ray, CBC, ESR, Sputum for AFB, and grams stains were done. A part from this spirometry including reversibility testing was performed (RMS Meds prior with transducer model number A00N 2003). FEV₁ was recorded in each patient.

Serum IgE was estimated by using Quantine IgE which is turbimetric Immune assay for estimation of immunoglobulin IgE in human serum.

The duration of study was January-2020 to June-2021.

Statistical analysis: Clinical manifestations, levels of IgE distribution, Distribution IgE on the basis of severity and Mean distribution were classified with percentage. The statistical analysis was done at SPSS software. The ratio of male and female was 2:1.

Observation and Results

Table-1: Study of symptoms of Bronchial Asthma 40 (47%) had dyspnoea, 28 (32.9%) had cough, 17 (20%) had wheezing.

Table-2: Classification of patient based on IGE level – 12 (14.1%) had 100-200 IgE level, 15 (17.6%) had 201 to 300 IgE level, 21 (24.7) had 301-400 IgE levels, 37 (43.5%) had 401-500 IgE levels.

Table-3: Comparison IgE levels with FEV₁ study – Mild FEV₁ had 5 (100-200), 2 (201-300), 4 (301-400), 5 (400-501) IgE. Moderate FEV₁ patients had – 1 (100-200), 7 (201-300), 5

(301-400), 4 (400-500) IgE levels. Severe FEV₁ patients had – 2 (100-200), 9 (201-300), 10 (301-400), 31 (401-500) IgE levels.

Table-4: Mean distribution of IgE as per the age – 24 was between 21-30 had 363 IgE, 16 were aged between 41-40 had 384 IgE, 32 were aged between 41-50 had 369.4 IgE, 13 were aged between 51-55 had 388.6 IgE levels.

Discussion

In the present study IgE in Bronchial Asthma 40 (47.0%) had dyspnoea 28 (32.9%), 17 (20%) had wheeze (Table-1) 12 (14%) patients had 100-200 IgE, 15 (17.6%) had 201-300 IGE, 21 (24.7%) 301-400 IgE 37 (43.1 %) had 401-500 IGE (Table-2). In the comparison of FEV₁ asthmatics had 5 (100 to 200), 2 (201 to 300), 4 (301 to 400), 5 (401 to 500) IGE. FEV₁ – Moderate had 1 (100 to 200), 7 (201 to 300), 5 (301 to 400), 4 (401 to 500). FEV₁ – severe asthmatics had 2 (100 to 2000), 8 (201 to 300), 5 (301 to 400), 37 (401 to 500) IgE levels. (Table-2) 24 patients were aged between 21-30 had 363 IgE, 16 were aged between 31-40 had 384 IgE, 32 were aged between 41-50 had 369.4 IgE, 13 were aged between 51-55 had 388.6 IgE (Table-4). These finding were more or less in agreement with previous studies (12)(13)(14)(15)(16).

The quantity of IgE and presence of allergen specific IgE antibody in serum are both important biomarkers for defining the phenotype of a patient who presents with asthma symptoms (17)(18)(19)(20). The levels of IgE also may be useful in predicting persistent wheezing and management (21)(22)(23). Detection of local IgE antibody in the skin and extracts tissue may aid in adjudicating negative in vivo and serological measures of IgE antibody despite Clinical evidence of atopic asthma (24)(25)(26)(27). The clinics can order specific IgE antibody tests to more than 200 individual allergen specificities, each corresponds to Dermato-phagoides pteronyssinus (dust mite) (28)(29)(30). Individually performed specific IgE test have been classified as supplemental bio-markers because the participant's clinical history is needed to identify the target allergens for testing and more than IgE antibody test is generally needed to characterize particular participants sensitivities.

Summary and Conclusion

The present study of levels of IgE in bronchial asthma was very higher than normal, although compared with spirometric study. This study will be useful to predict the severity and prolongation of atopic asthma. But the Novel thing observed during study that, severity of asthma was more in night compared to day, it could be Eosinophils are more active during night. But this study demands further genetic, hormonal, nutritional patho-physiological, environmental studies because exact pathogenesis of bronchial asthma is still un-clear

Limitation of Study – Owing to tertiary location of present hospital, small number of patents and lack of latest techniques we have limited findings.

- **This study was approved by Ethical committee of GMC and Hospital Aurangabad, Maharashtra.**
- **No Conflict of interest**

- No Funding

Table-1
Symptoms of Bronchial asthma patients

Sl. No	Symptoms	No. of patients (85)	Percentage %
1	Dyspnoea	40	47.0
2	Cough	28	32.9
3	Wheeze	17	20.0

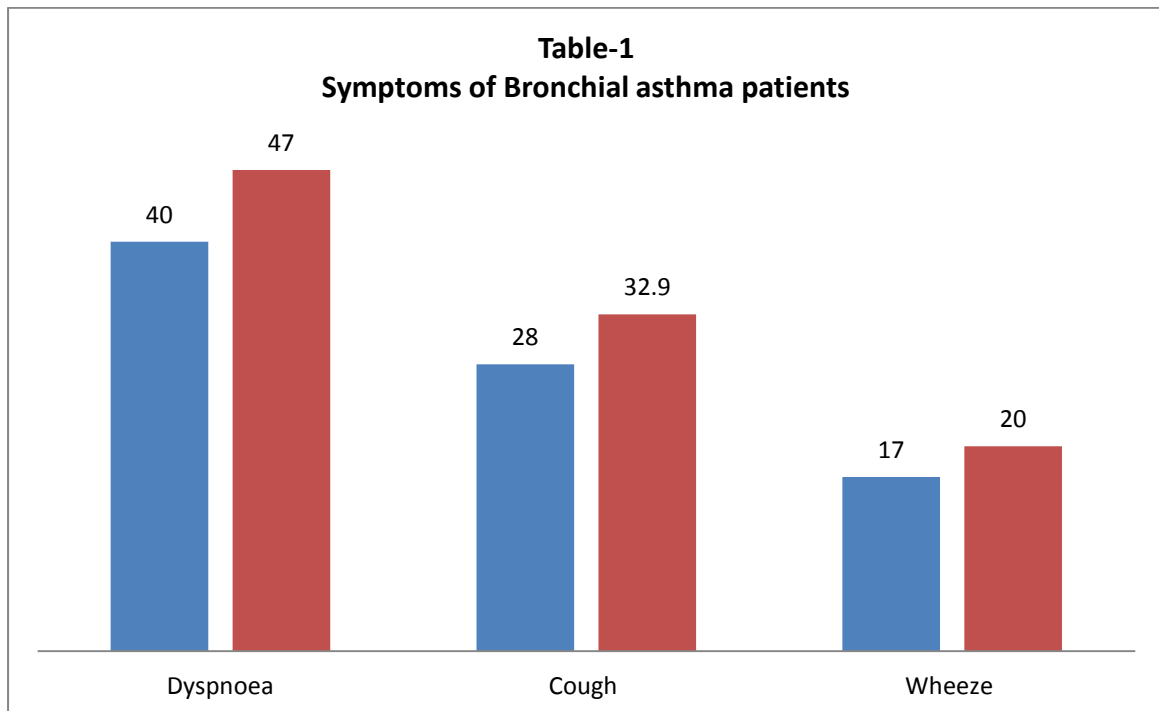


Table-2
Classification of patients based on IgE levels

IGE (IU// ml)	No. of patients (85)	Percentage %
100-200	12	14.1
201-300	15	17.6
301-400	21	24.7
401-500	37	43.5

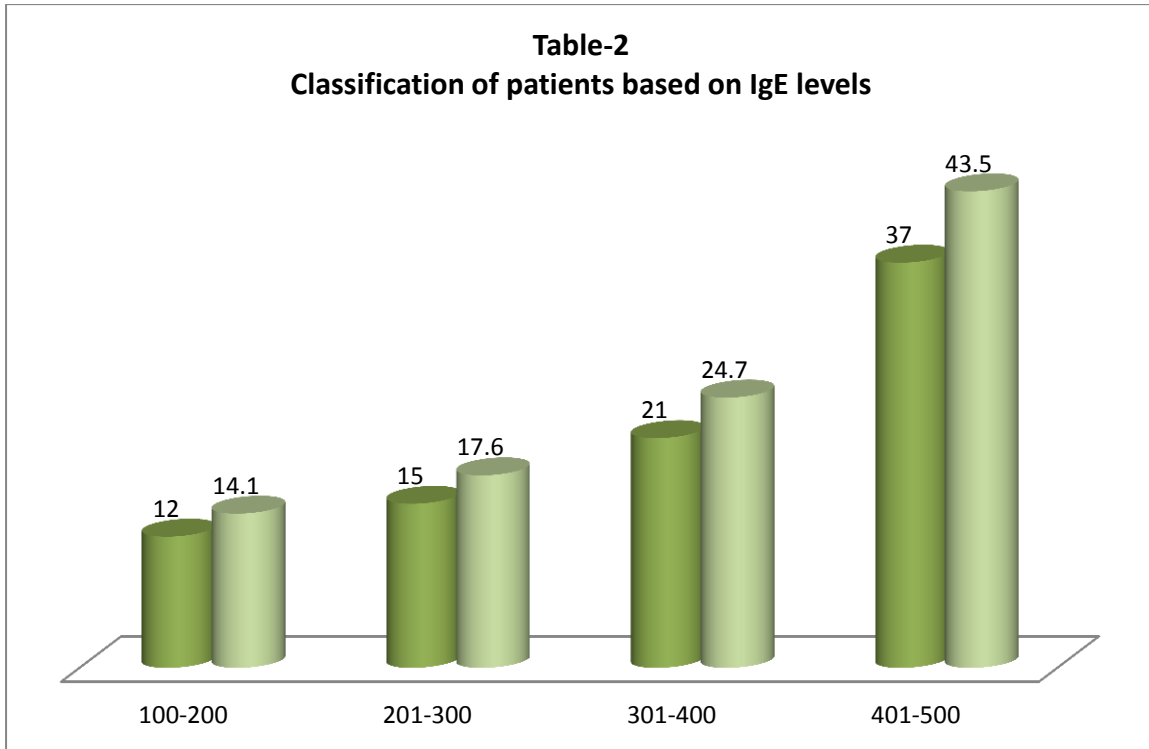


Table-3
Comparison of IgE levels based on severity of respiratory obstruction with FEV₁ parameters

FEV1 Parameter	100 to 200	201 to 300	301 to 400	401 to 500
Mild	5	2	4	5
Moderate	1	7	5	4
Severe	2	8	5	37

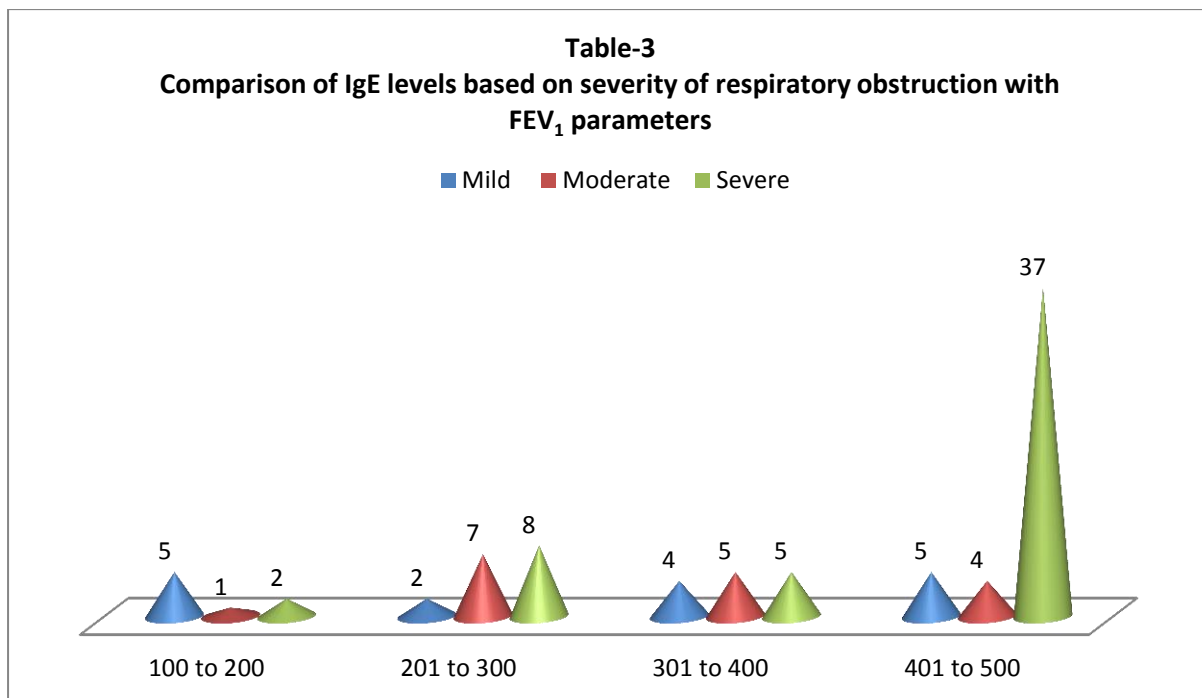
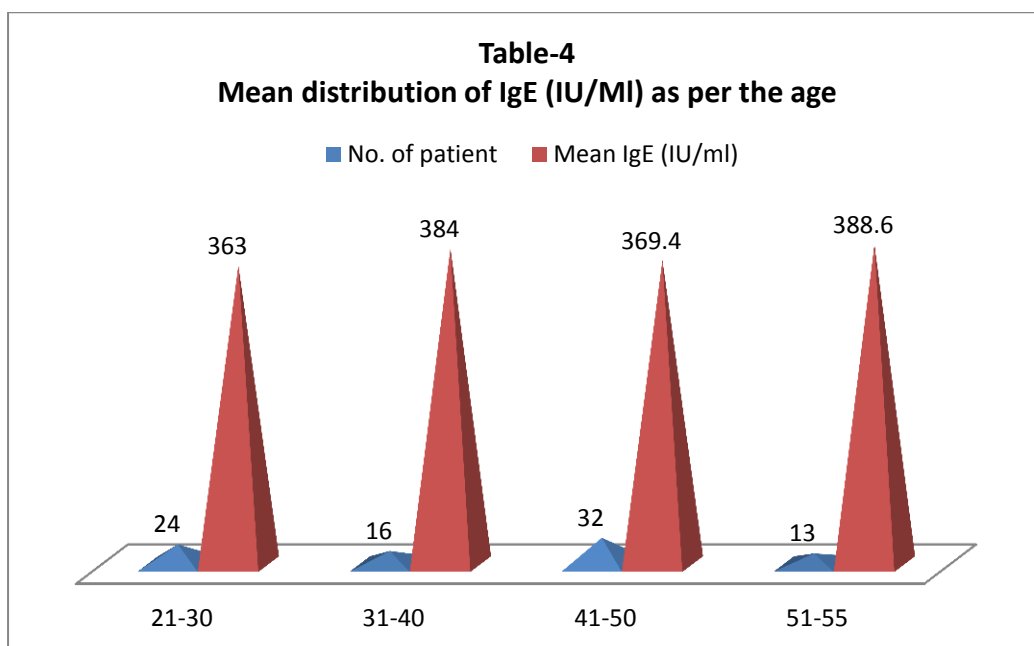


Table-4
Mean distribution of IgE (IU/ml) as per the age

Age of the patients	No. of patient	Mean IgE (IU/ml)
21-30	24	363
31-40	16	384
41-50	32	369.4
51-55	13	388.6



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