To investigate the relation between total IgE levels and spirometery in asthma

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Abstract

Background: The present study was carried out to observe the relationship between total IgE levels and spirometry in asthma.
Methodology: The study was carried out in KBN Hospital Respiratory clinics OPD. Total 100 patients with asthma symptoms were taken in study, with no other systemic disorder. Serum IgE levels were measured by ELISA technique, value >100IU/ml were taken as positive, spirometry was conducted on all patient by using USB spirometer according to ATS standard data were analyzed.
Results: We included 100 patients of asthma in our study, serum IgE levels varied markedly showing IgE levels-90% (50% >100IU/l and 40% >400IU/l) of IgE levels were more than 100IU/l and 10% were less than 100IU/l spirometery showed 60% were having FEV1/FVC%>80% and 40% were <80% (<60%-15% and 25%-80-60%).
Conclusions: The mean percentage of predictive value of FEV1/FVC is significantly low in high IgE levels. It was concluded that serum IgE levels increase, as the severity of airflow obstruction increases.

Keywords: FEV1-Forced expiratory volume; FVC-Forced vital capacity; Immunoglobin-E.

Introduction:

Asthma is increasing in prevalence due to urbanization and air pollution [1]. Asthma patients have the airway hyper responsiveness airway due to inhaled antigen and chemical agent [2]. Global prevalence of asthma worldwide ranges from 1%-18%. According to GINA asthma is defined as a chronic inflammatory disorder of the airway in which many cells and cellular element play a role. The chronic inflammation is associated with airway hyper responsiveness that lead to recurrent episode of wheezing, breathlessness, chest tightness and coughing particularly at night and early morning [3].

The term atopy has been used to describe allergic condition characterized by the production of IgE antibodies to common environmental allergen. Atopy refers to an inherited tendency to respond to naturally occurring inhaled allergen with continual production of IgE. This production of IgE antibodies against allergen is called sensitization [4].

Measurement of total IgE is helpful for diagnosis of allergic disease and is a factor for development of bronchial hyper responsiveness in asthma [5].

Materials and Methods:

The present study was under taken in allergy clinic at the KBNIMS Hospital, Kalaburagi with an aim to investigate association between IgE level and spirometery.

Inclusion Criteria:

1. Age: 18-65 years
2. Clinical feature of asthma as per GINA guideline 2011 December and ISSAC 1998.
3. Spirometry value demonstrating obstructive airway disease.
4. Patient willing to give written information.

Exclusion Criteria:

1. Presence of other cause of dyspnea, like cardiac, renal, infective condition of lungs.
2. Tropical pulmonary eosinophilia.
3. Emphysema and bronchitis (smoking)
4. Tuberculosis.

The group consists of 100 patients; a detailed history was taken, as defined in the questionnaire.

Routine screening investigations were done to exclude other cause of dyspnea. Spirometery was done to know the of lung functions. Written informed consent was obtained from all subjects.

Spirometery: The spirometry was performed by micro-medical USB spirometer. The forced vital capacity (FVC) and forced expiratory value in first second (FEV1) was measured using standard guidelines [7] because procedure is effort dependent and performed until deviation of FEV1 and FVC was less than 5%, only the best curve was used for analysis, spirometery data was expressed as the percentage of predicted value and any age and height was corrected for using standardized residential. FEV1 and FEV1/FVC value less than 80% with normal FVC was taken to indicates airway obstruction, patient with more sever disease have greater reduction observed value of these parameter, additionally quantification of bronchodilator reversibility spirometery was done. First base line spirometery was followed by inhalation of 200-400 microgram of salbutamol and repetition of spirometery after 15-30min. A greater than 12% or greater than 200ml absolute increment in either FVC or FEV1 than the baseline value is considered as being suggestive of bronchial reversibility and strongly favors the diagnosis of brachial asthma [7].

Total IgE: The total IgE levels were performed by using commercially available ELISA kit in general biological crop. Taiwan anti IgE wells were used detect the level of total of IgE. Patient sera (20 micro filter) and control were added in to appropriate wells for 10 sec and incubated at room temperature for 30 min. Washing was carried out 5 times with distilled water and 150 ml of anti IgE enzymes conjugate was added and gently mixed and incubated for 30 minutes at the room temperature. The wells were washed for 5 times and added 100 micro filter of tetra and added 100 micro filter of tetra methyl benzidine (TMQ) solution and incubated for 30 minutes at room temperature. The wells were washed for 5time and added 100 milliliters methyl benzidine (TMB) solution and incubated for 20 minutes; reaction was stopped by adding 50 micro liter of stop solution in each well and read the optical density at 490 am with micro liter plate reader within 15 minutes. The test considered positive for value >100IU/ml.

Results

Table 1: Shows IgE levels 90% (50% >100IU/l and 40% >400IU/l) of IgE levels were more than 100IU/l and 10% were less than 100IU/l in the present study

	Frequency	Percent	Valid percent
<100	10	10	10
>100	50	50	50
>400	40	40	40
	100	100	100

Table 2: Spirometery shows 60% were having FEV1/FVC% >80% and 40% were <80% (<60%-15% and 25%-80-60%)

	Frequency	Percent	Valid percent
>80%	60%	60%	60%
>80-60	25%	25%	25%
<60	15%	15%	15%
	100	100	100

Discussion:

Allergy is considered as an important factor for bronchial asthma, atopy comprises all IgE mediated disease and individual with atopy have a genetic predisposition to produce IgE [9]. Atopy is accompanied by increase IgE level [9]. In the present study IgE level were comparable to levels seen in study of Criglive et al., the findings suggested that a high level of IgE in the presence of disease may involve inflammation and impaired lung function [10-12]. It was the found that serum IgE values increase with severity of airway obstruction and the same was observed in the study by Theruna et al. [13].

In one study IgE level is an important predictor of declining lung function [14], so measurement of IgE were helpful for the diagnosis of the allergic disease and is a factor for the development of bronchial hyper responsiveness and variation in spirometery in asthma. The spirometery was helpful in making a more confident diagnosis of asthma [7]. In the present study FEV1/FVC <80% were close to data from earlier studies [14]. The data of our study showed different parameters in lung function in relation with the IgE, these results were similar to other studies reported earlier [15].

Conclusions:

Our study concluded that serum IgE levels in asthma patients is elevated and it increase with the increase in severity of airway obstruction and it helps in guiding the anti IgE therapy for a patient with difficult to treat asthma.

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