Determination of IGE level in Asthmatic Adult Males Patients on Attack and Rest Period

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Abstract

Sixty male patients with asthma were included in this study, their age ranged between 18-24 years (mean 20 ±1.3). Forty-five were in attack state and fifteen were in rest (between the attacks). All cases were admitted to Al-Rasheed military hospital during November 2001 and April 2002.Twenty age matched apparently healthy en were included as a negative control.

Eight males with signs and symptoms of asthma (mostly chronic bronchitis patients) were regarded as a positive control. Ten ml of blood sample were withdrawn from each patient as well as from controls.

IgE level was measured by enzyme linked immunosorbant assay (ELISA) in which a significant elevation were noticed in both groups attack and rest groups in comparison with control groups.

Key wards: IGE, Asthmatic, immune response.

Introduction

To understand the mechanical differences and immune response variety in allergen and ordinary antigen, we have to know the role of T lymphocyte and their subsets in managing the immune response.

Th1 and Th2 cells represent two polarized forms of the CD4+ Th cell mediated specific immune response

Th1 cells produce INF-γ and IL-2 and TNF-β, which have effect on production of opsonizing and complement fixing antibodies by B cells, activation of macrophages, cell cytotoxicity and induction of cell mediated immunity (CMI). Th_1-dominated predominately a phagocytic dependent inflammation. Th_2 produce IL-4, IL-5, IL-6, IL-9, IL-10 and IL-13, which evoke strong antibody response, including IgE, favor eosinophil differentiation and activation, but inhibit several function of phagocytic cells. Thus providing a form of phagocyte- independent inflammation [1].

Many factors play an important role in the deviation toward Th1 or Th2 these are either environmental or genetic factors which acting at the time of antigen presentation to the naive Th cell. The environmental factors already known are the route of antigen entry, the physical form of immunogen, the type of adjuvant and the alleles of antigen [2]. The genetic factors still remain elusive. The extrinsic and genetic factors act together to influence the Th1/Th2

IL-4 induces germ line transcription of Ig-γ_4 and ε heavy chain constant region gene followed by switch recombination to IgG_4 and IgE synthesis (3). IL-4 also enhance B-cell growth, antigen presentation by APC and also induction of mast and basophile cells (4).In this study we intended to study the role of IgE in asthmatic patients.

Patients, Materials & Methods

Sixty asthmatic male patients were selected between November 2001 and April 2002.Their ages ranged between 18-24 years. They didn't take any drugs and they were subjected to the committee to prove they are asthmatic or not. They were proved to be asthmatic patient using pulmonary function test, clinical and physical ground. Forty-five of them were in attack and fifteen of them were in rest. All the patients were admitted to Al-Rasheed military hospital.

Control Groups

Negative Control

Twenty apparently healthy male adults age matched were regarded as negative control group and they didn't have a previous history of: Shortness of breath or asthmatic attack or persistent cough not smoker, no parasitic manifestation or any other disease (eczematous skin disease, running nose, family history of allergy, food and drug allergy).

Positive Control

Eight of non-asthmatic patient, but with sign and symptoms of asthma (SOB, cough and wheezing), were selected and considered as a positive control

Total IgE Enzyme –linked immunosorbant assay (ELISA) for Quantitative determination of total IgE in serum.

Principle of the test

This test is two site enzyme-linked immunosorbant assays for the qualitative determination of IgE (Kit for Total IgE, Biomaghreb.) . The first, mouse monoclonal antibody is immobilized onto the plastic well.

The diluted sample was incubated with the solid phase antibody coated well, and then washing to remove excess Abs.

Conjugated labeled antibody is added .If IgE is present in the sample "Sandwich" complex is formed. (Mouse monoclonal antibody IgE-sample IgE-conjugate goat antibody IgE).

After washing to remove the unbound antibody, a chromogen (PNPP) is added and the color intensity is measured by spectrophotometer at 405 nm in which the intensity is directly proportional to the serum level IgE [5]

Statistical analysis: The statistical analysis was performed by analysis of variance (ANOVA) and t- test according to (McCall.1980)

Results

Table (1) and figure (1): Show the comparison between the level of IgE (IU/ml) in attack group and control groups, there were significant differences between attack and –ve control (P=0.0001), and also significance difference between attack and +ve control. (P=0.0001).

Table(2) Shows the comparison between the levels of IgE (Iu/ml) in rest group and control groups, there were a significant difference between rest group and –ve control (P=0.0001), and also a significance difference between rest group and +ve control .(P=0.0002).

Table (1): IgE level in attack and control groups.

	Attack(n=45)	Negative control(n=20)	Positive control(n=8)
Minimum	107	20	20
Maximum	2490	263	137
Mean	812.5	82.65	68.3
SD	551.8	66.13	37.9

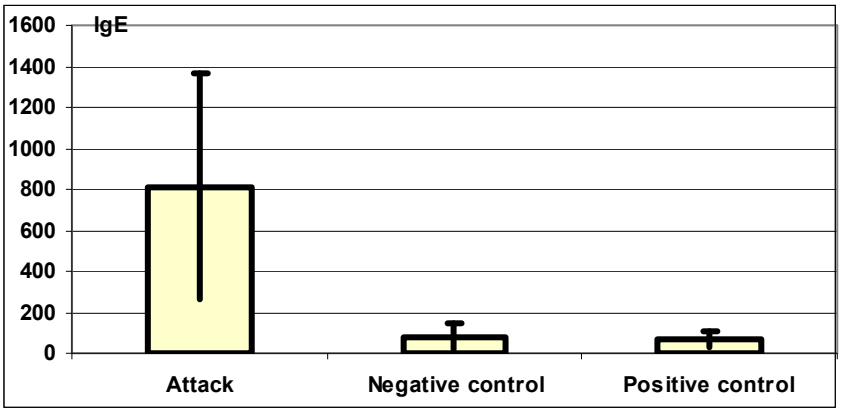

Figure (1): Bar chart shows significant elevation in the level of IgE in attack group.

Table (2):IgE level in rest and control groups

	Rest(n=15)	Negative control(20)	Positive control(n=8)
No. of patient	**15**	**20**	**8**
Minimum	**53**	**20**	**20**
Maximum	**794**	**263**	**137**
Mean	**401.27**	**82.65**	**68**
SD	**265.4**	**66.13**	**37.9**

Discussion

The IgE antibody (Ab) constitutes less than 0.005% of the total immunoglobulin pool and has a half-life of approximately 2.5 days. It is highly homocytotropic which means that this antibody has an affinity for cells especially tissue mast cells, in children level increases steadily till the peak is obtained at 10-15 years . In healthy children the Al-Taweel suggested the 250 IU/ml is the cut off point in differentiating atopic from non atopic asthma [6].

In the current study there were significant differences between all groups by ten fold between attack and control groups. This could explain by the immune deviation toward Th2 response with over excretions of IL-4 and IL-13 secretion [7, 8].

In rest group there was a significant difference by five fold because most of the patients were selected as atopic patient (early childhood asthma), that mean they are genetically predisposed to form IgE response to antigen (allergen) [9]. In the questionnaires the patients' were asked about the history of parasitic disease to exclude the other cause of high IgE level other than atopy.

So IgE levels in both states attack and rest were high but more in asthmatic attack

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