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The Relationship of IgE Level with Some Biochemical Variables in Iraqi Asthmatic Adult Patients

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Abstract

A chronic respiratory illness known as asthma causes inflammation and airway constriction, which makes breathing difficult. Several metabolic measures may be employed to detect and track asthma. In addition to evaluating the amount of IgE, blood samples from 40 asthmatic patients were obtained and examined to determine the concentrations of triglycerides, cholesterol, and fasting blood sugar (FBS). Along with measuring healthy people, each patient's body mass index was determined.

The findings showed that there was no discernible difference in fasting blood sugar and cholesterol levels between asthmatic patients and healthy volunteers, but that there was a significant difference in the high triglyceride levels in asthmatic patients as compared to healthy subjects, as well as a significant increase in IgE in these patients. The results showed that the patients had higher BMIs than the healthy subjects in terms of BMI. In addition to a considerable rise in IgE levels, this study discovered that one of the biochemical factors, triglycerides, is noticeably greater in asthmatic patients than in healthy individuals.

It is crucial to remember that the presence or absence of these biochemical markers does not always confirm or rule out an asthma diagnosis. To develop a diagnosis and choose the best course of action, they should be utilized in conjunction with other clinical findings, such as patients' symptoms and medical background.

Keywords: Asthma, Biochemicals, IgE

Introduction

Antigen-antibody responses are allergies. Antigens are described as environmental substances that, upon inhalation, ingestion, or injection, cause immunoglobulin IgE-mediated hypersensitivity reactions. Some people with allergies are genetically prone to develop mono- or poly-sensitization to inhalants, investments, or injections.

One of the most prevalent chronic diseases and a major global public health issue is asthma. An important part of the pathogenesis of asthma is played by the innate and adaptive immune systems. The most prevalent kind of asthma is allergic asthma, when symptoms are brought on by various allergens including pollen, animal dander, or dust mites. Characteristics of this phenotype include higher serum levels of IgE and inflammatory cytokines. [1]

More than 6 million children worldwide suffer from asthma, which is a more prevalent childhood illness. The lung condition asthma results in pneumonia, which frequently triggers episodes of coughing, breathlessness, and wheezing. During a severe asthma episode, the lining of the lungs' airways swells and becomes irritated. This causes mucus to

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build up in the airway, which causes the surrounding muscles to spasm.

As a result, there is less airflow. Following is a description of asthma: Airway inflammation causes swelling and redness, which causes the airway to become narrower.

Airway obstruction is caused by the muscles around the airway contracting, which causes the airway to constrict and hinder the air's ability to enter and leave the lungs. The muscles that surround the airway will react more quickly and violently to modest levels of allergens and irritants. [2].

There is little doubt that many different biological organisms and cells, especially mast cells, eosinophils, lymphocytes, macrophages, neutrophils, and epithelial cells, play a part in the chronic inflammatory condition that affects the airways. It causes wheezing, chest tightness, coughing, and shortness of breath in variable and recurrent bouts, frequently at night or in the early morning [3,4].

Combining serum IgE levels with other indicators can help distinguish between those who have asthma and those who don't. Serum IgE levels were predictive in asthma. In 36% of asthmatic patients receiving specific immunotherapy, overall serum IgE levels were reduced [5].

According to a study, asthmatic patients may experience an alteration in glucose metabolism brought on by inflammation-induced insulin resistance, which may raise their chance of developing diabetes mellitus] 6[

A connection between obesity and asthma may have been complicated by the second study found the presence of both hypertriglyceridemia and insulin resistance [7].

The clinical significance of employing biomarkers to predict the course of asthma and the therapeutic response to treatment, particularly in cases of severe asthma, cannot be overstated. Important research has recently been done to pinpoint reliable asthma biomarkers [8].

In the case of experimental diabetes, mast cells are crucial. Human diabetes is characterized by elevated levels of chemokines, tryptase, and immunoglobulin E (IgE) in the plasma. Whether they are linked to prediabetes risk as well [9].

Materials and Method

At the Asthma and Allergy Center in Baghdad, blood samples totaling five milliliters were extracted from 40 asthmatic patients (20 males and 20 females), ranging in age from 18 to 60. Twenty males and twenty females who ranged in age from 18 to 55 years old gave blood samples as a control group at the same time. After blood was separated, serum was recovered. Samples were then divided into different portions and stored until the analysis was carried out. In addition to evaluating the level of IgE, serum samples were examined following the protocols used for triglycerides, cholesterol, and fasting blood sugar. In addition to the healthy group, each patient's body mass index was computed using the formula BMI = Weight Kg/M^2

Measurement of Glucose, Cholesterol, and Triglyceride Concentration

The colorimetric enzymatic approach was used to determine the concentration of glucose, cholesterol, and triglycerides.

Measurement of Immunoglobulin-E: Serum Total IgE Estimation

Serum Total IgE Estimation by ELISA Technique.

Results

Blood samples were taken from 40 patients with asthma, who were between the ages of 18 and 60, and 40 healthy individuals between the ages of 18 and 55 who served as control groups, MI was computed for each person in the two groups and the findings are shown in the table. (1).

Table 1: Age and BMI comparison between the patient and control groups

Group	Mean ± SE	
	Age (year)	BMI (kg/m^2)
Patients	42.40 ±1.72	28.10 ±0.63
Control	37.90 ±1.85	19.22 ±0.62
T-test	5.105 NS	1.825 **
P-value	0.0831	0.0001
** (P≤0.01), NS: Non-Significant.		

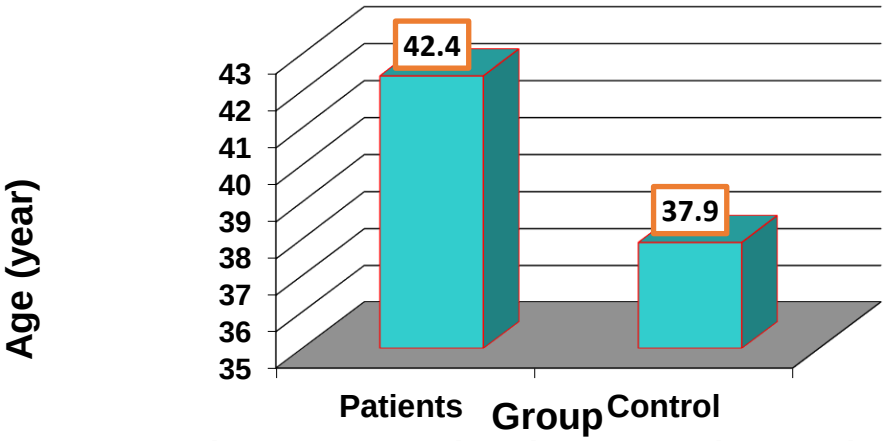

Figure 1. Comparison between patients and control groups in Age

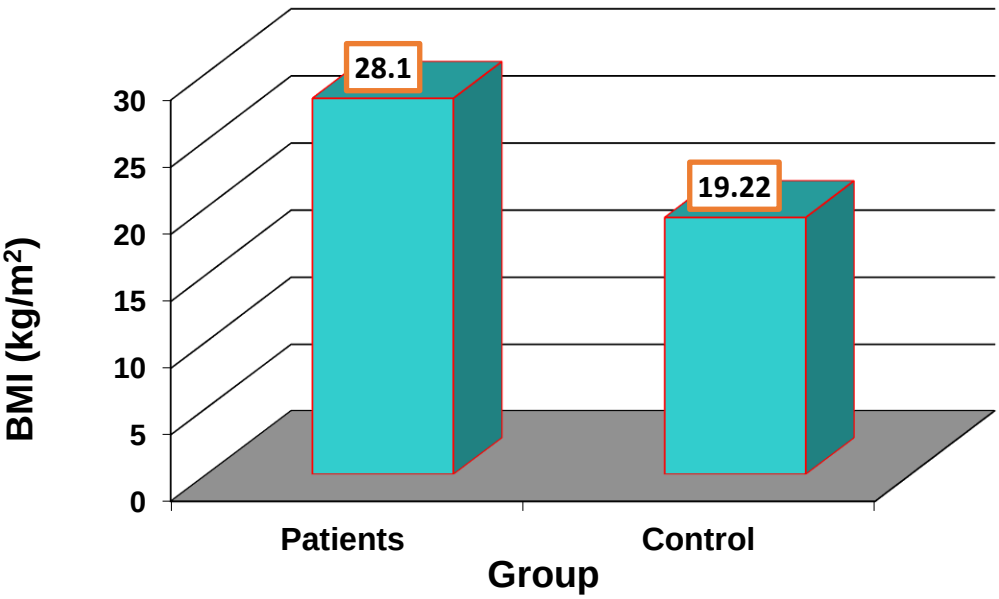

Figure 2. Comparison between patients and control groups in BMI

Table 2: T.G. and T.C. Comparison of Patients and Control Groups

Group	Mean ± SE	
	Triglyceride (mg/dl)	T. Cholesterol (mg/dl)
Patients	218.82 ±9.39	176.65 ±9.08
Control	115.60 ±5.51	169.26 ±6.24
T-test	213.672 **	23.578 NS
P-value	0.0001	0.534
** (P≤0.01), NS: Non-Significant.		

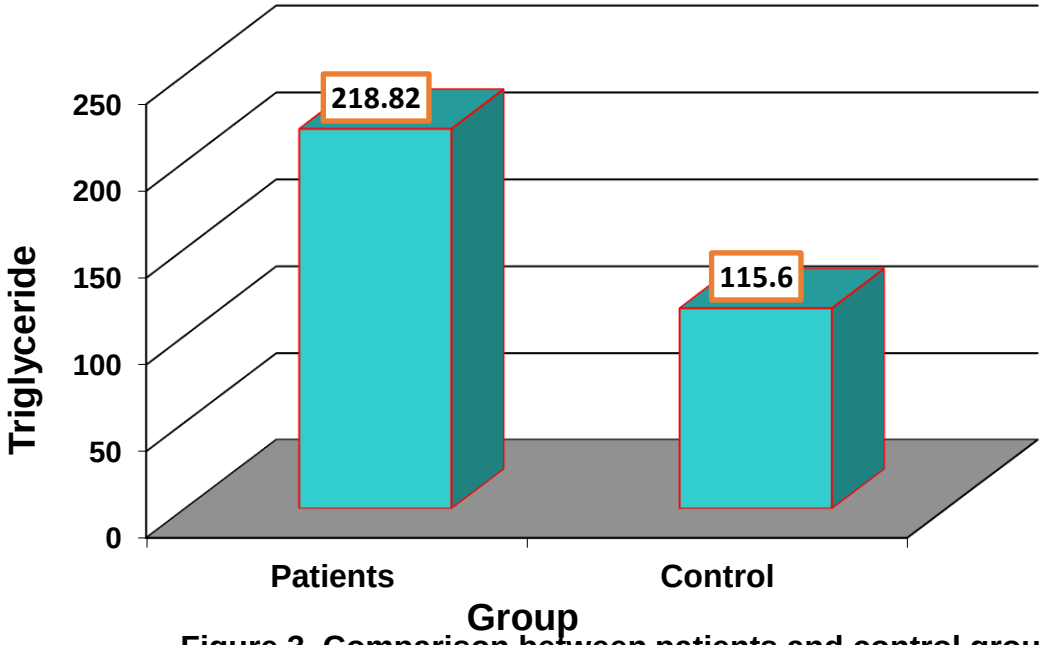

Figure 3. Comparison between patients and control groups in Triglyceride

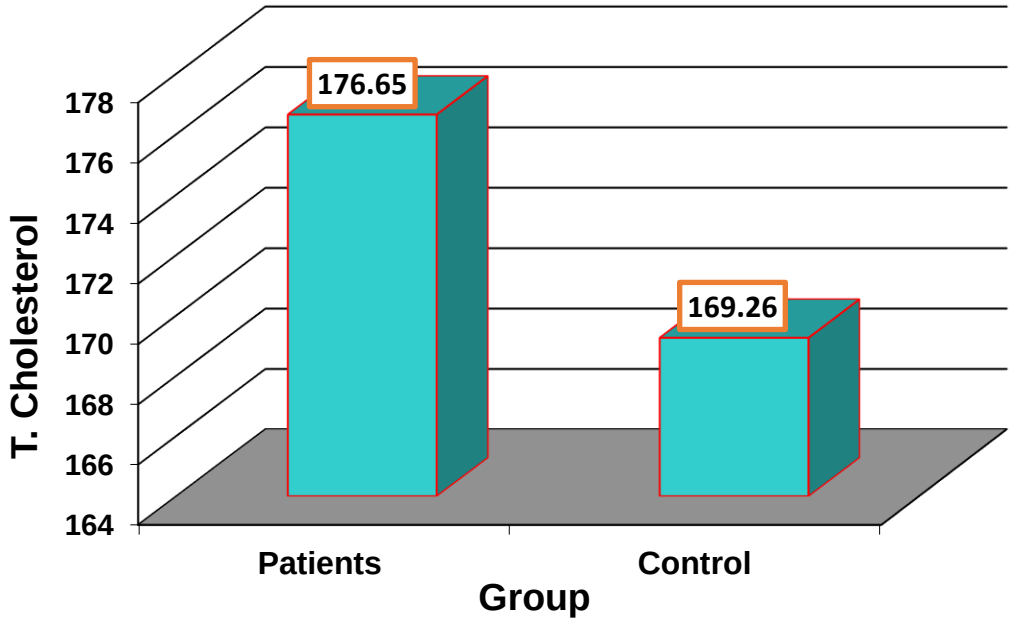

Figure 4. Comparison between patients and control groups in T. Cholesterol

Table 3: FBS and IgE Comparison of Patients and Control Groups

Group	Mean ± SE	
	F.B.S (mg/dl)	IgE (kUA/L)
Patients	101.00 ±4.38	326.56 ±27.11
Control	92.53 ±2.48	37.64 ±7.44
T-test	10.985 NS	63.897 **
P-value	0.128	0.0001
** (P≤0.01), NS: Non-Significant.		

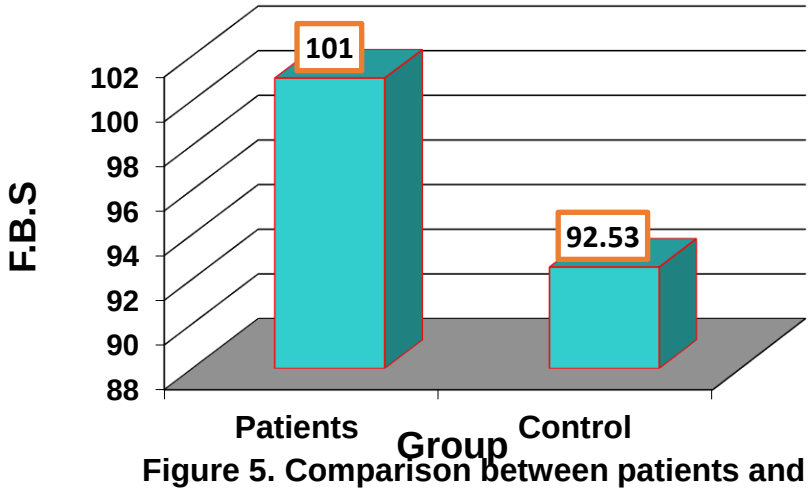

Figure 5. Comparison between patients and control groups in F.B.S

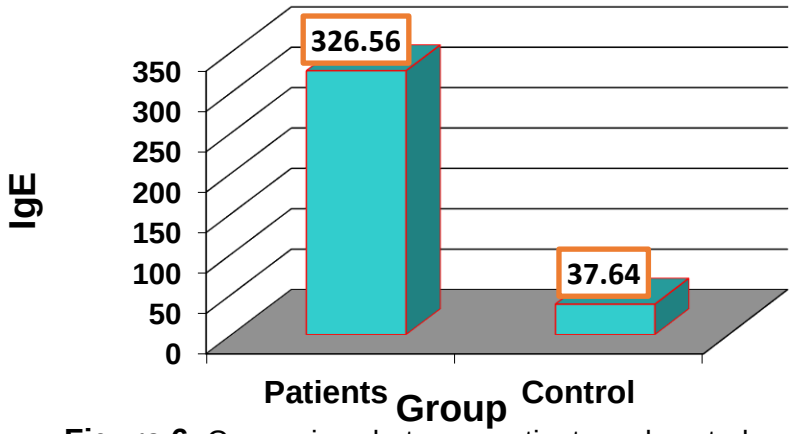

Figure 6. Comparison between patients and control groups in IgE

IgE levels and the variables under investigation were computed and the results are displayed in Table 4.

Table 4: Correlation coefficient between IgE and other parameters of patients

Parameters	Correlation coefficient-r with IgE	Sig.
Age	0.25	*
BMI	0.59	**
Triglyceride	0.56	**
T. Cholesterol	0.17	NS
F.B.S	0.02	NS
* (P≤0.05), ** (P≤0.01).		

Table 5: Study of patients' group's effects of gender on several aspects

Parameters	Mean ± SE		T-test
	Male	Female	
BMI (kg/m^2)	27.42 ±0.90	28.79 ±0.89	2.579 NS
Triglyceride (mg/dl)	243.85 ±12.13	193.80 ±12.20	34.844 **
T. Cholesterol (mg/dl)	187.15 ±13.53	166.15 ±12.01	36.632 NS
F.B.S (mg/dl)	104.70 ±5.22	97.30 ±7.07	17.807 NS
IgE (kUA/L)	381.45 ±28.15	271.68 ±43.68	105.22 *
* (P≤0.05), ** (P≤0.01).			

Discussion

The research was carried out to determine the relationships that may exist between the level of IgE and some biochemical variables, including fasting blood sugar, cholesterol, and triglycerides in addition to its relationship to BMI, due to the paucity of studies that have been done on asthma patients in terms of biochemical variables.

Results in Table 1 indicate the link between patients and healthy individuals in terms of age and BMI. Take note that the BMI increased significantly when compared to healthy subjects, indicating a substantial relationship between patients and healthy subjects.

According to Table 2, there is a substantial difference between the levels of triglycerides in sick and healthy people. The results in the previous table, which showed a substantial correlation between the growth in BMI in patients compared to healthy people, maybe the cause. According to a study, the TG readings considerably rose with increasing BMI levels [10].

However, IgE levels in patients and those in the healthy group are significantly correlated., which is obvious given that studies have shown that asthmatic patients have higher levels of IgE than the healthy group. The results in Table 3 show that there is no significant relationship between FBS levels in patients compared to the healthy group [11,12].

The link between the level of IgE and the previously listed variables is shown in Table 4

According to Table 5's findings, there is no significant difference between males and females in terms of FBS, cholesterol, or BMI values, but there is a difference between males and females in terms of triglycerides and IgE levels because the level of triglycerides in male asthmatic patients was higher than in female asthmatic patients. Studies have shown that men had higher levels of triglycerides than women [13].

Conclusion

According to this study, which was conducted on asthmatic patients and the results were compared with healthy subjects, there is a significant increase in the level of triglycerides compared to healthy individuals, asthmatic patients also had higher levels of IgE.

Conflict of interest

There are no conflicts of interest declared by the author.

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