

Measurement of IgE hypersensitivity among people attending the tertiary allergic center in Kirkuk, Iraq

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ABSTRACT

Immunoglobulin E (IgE) is ordered as the least abundant, but in many regards, the most potent, of the enormous antibody classes found in the mammals. IgE mediates the reactions of type 1 hypersensitivity allergic. Generally, IgE plasma levels are very low with 100,000-fold than those of Immunoglobulin G. However, these levels could be obviously increased in specific conditions of allergy, such as bronchopulmonary aspergillosis, or in case of parasitic diseases like schistosomiasis. Additionally, plasma cells of IgE exist in mucosal areas. In particular, it exists in the respiratory tract, where the secreted IgE mediates reactions of allergic.

In this work, the questionnaire was distributed to the study sample, which consisted of both males and females for detecting the numbers of cases of allergy types found at the tertiary allergic center in Kirkuk. The cases were diagnosed by blood tests to determine the amount of IgE in their blood samples. The total number of patients was 40; hence, there were 20 female patients and 20 males. These patients had different types of IgE mediated allergy disease. Most of these types were found in the adult. The results showed that both males and females were equal (each gender scored 20, representing 50% of the total sample). Most of the serum IgE test was negative.

Finaly this study demonstrated the low frequency of allergic diseases in children and young people; however, this was high in old people whose ages ranged between 36 and 50 years. Most of the cases were allergic bronchitis and skin allergy.

Keywords: IgE, Allergy, Allergic bronchitis.

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قياس فرط الحساسية IgE بين الأشخاص الذين يراجعون مركز الحساسية في

كركوك - العراق

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المخلص

يتكون مستويات البلازما IgE منخفضة جدا مع مستويات اضعافها في IgG ويزيد في حالات تفاعل الحساسية مثل التهاب قصبات الهوائية التحسسي وحساسية الجلد.

في هذا العمل ، تم توزيع الاستبيان على عينة الدراسة ، التي تتألف من كل من الذكور والإناث للكشف عن أعداد حالات أنواع الحساسية الموجودة في مركز الحساسية الثالث في كركوك. تم تشخيص الحالات عن طريق اختبارات الدم لتحديد كمية IgE في عينات دمهم. كان العدد الإجمالي للمرضى 40. وبالتالي ، كان هناك 20 مريضا و 20 من الذكور. كان هؤلاء المرضى أنواع مختلفة من مرض الحساسية بوساطة IgE. تم العثور على معظم هذه الأنواع في البالغين.

أظهرت النتائج أن كلا من الذكور والإناث متساوون (كل جنس سجل 20 ، يمثل 50 ٪ من العينة الكلية). كان معظم اختبار المصل IgE سالبًا.

في النهاية أظهرت هذه الدراسة انخفاض وتيرة أمراض الحساسية لدى الأطفال والشباب. ومع ذلك ، كان هذا ارتفاعًا في كبار السن الذين تراوحت أعمارهم بين 36 و 50 عامًا. وكانت معظم الحالات التهاب الشعب الهوائية التحسسي والحساسية الجلدية.

الكلمات الدالة: فرط الحساسية ، IgE ، التهاب قصبات الهوائية التحسسي .

1. Introduction

Allergen-specific IgE is an integral part of the pathogenesis of allergic diseases. The usefulness of calculating the total serum IgE for diagnosis and treatment is variable. It is significant to realize that total IgE levels rarely provide details about IgE to certain allergens. The IgE presence to a certain allergen does not essentially equate with a clinically meaningful allergic response to that substance. Also, it is important to determine the appropriate symptoms and signs that are developed in the individual upon exposure to the allergen concerned [1]. Allergies, also called diseases of allergy, represent certain conditions resulted from the immune system hypersensitivity to harmless materials in the environment [2].

These disorders include food allergies, atopic dermatitis, hay fever, anaphylaxis and allergic asthma. Symptoms of such diseases may consist of a runny nose, an itchy rash, red eyes, sneezing, breath shortness, or swelling. It is well known that common allergens consist of certain food and pollen [2]. Also, metals and other materials could cause health problems [2]. Severe reactions could result from these common causes, including food, medications and insect stings. The basic mechanism requires IgE antibodies (it represents part of the immune system of the body) and binding to an allergen. After that, a receptor on basophils or mast cells where it causes the release of inflammatory substances like histamine [2].

Typically, diagnosis is performed on the basis of the medical history of individuals or patients [3]. In specific cases, it may be useful to conduct additional testing of blood or skin [3]. However, positive tests may not indicate the presence of a significant allergy to the material concerned [4].

2. Materials and methods

The IgE Rapid Test (Cassette) (serum/plasma) refers to a flow chromatographic immunoassay on the basis of the technique of double antibody sandwich. Based on this test, the anti-IgE antibody is immobilized in the test line region of the strip in the test device. After adding a specimen to the specimen well of the device, it reacts with anti-IgE antibody-coated particles in the test. This mixture moves chromatographically along the test strip length and interacts with the immobilized anti-IgE antibody.

Additionally, there will be a colored line in the region of the test line when the total IgE concentration is at or above the sensitivity level of the test; thus, this indicates a positive result. On the

contrary, if the total IgE concentration is below the sensitivity level of the test, there will not be a colored line in that region; in consequence, this indicates a negative result. For serving as a procedural control, there will always be a colored line in the region of the control line. This indicates that a proper specimen volume is inserted, and membrane wicking has appeared.

Allergies can be confirmed or ruled out using allergy testing. The symptoms incidence and the need for medications can be reduced by correct diagnosis, avoidance advice, and counseling on the basis of the valid results of the allergy test. In addition, improving life quality assesses the existence of allergen-specific IgE antibodies. Two different tests can be utilized: an allergy blood test or a skin prick test. Both tests are recommended due to having the same diagnostic value as well as being cost-effective in comparison to no test, as shown by health economic evidence. The cost can be saved by early and more precise diagnosis. This is because of reduced consultations, referrals to secondary care, misdiagnosis and emergency admissions [5][6].

In blood testing, the concentration of specific IgE antibodies in the blood is measured. Outcomes of quantitative IgE tests increase the probability of classifying the ways whereby different materials may have impact on symptoms. The thumb rule is that if the IgE antibody value is higher, the probability of symptoms will be greater. Nowadays, allergens found at low levels that do not cause symptoms, which in consequence, cannot assist in anticipating future development of symptoms.

The result of quantitative allergy blood test can be useful in determining substances that cause allergy to a patient, predicting and following the development of disease, estimating the risk of a severe reaction and explaining cross-reactivity [7-9].

3. Results

The tests were applied to 40 patients with different types of allergy. This study consisted of 20 (50%) males and 20 (50%) females with ages ranging between 5-65 years. Most of the patients were over 30 years of age. The majority of cases were allergic bronchitis, found in about 15 (37.5%) cases. While skin allergy was reported in 9 (22.5%) cases. Moreover, there were 7 (17.5%) cases recorded for rhinitis, 2 (5%) cases for each of bronchogenic asthma and contact dermatitis, and only 1 (2.5%) case for each of the laryngobronchitis, urticaria, tonsillitis and asthma. Table 1 illustrates the results according to age groups. The highest age group affected was between age 36 and 50 years, where allergic bronchitis was the most dominant case; whereas the lowest age group was between 5-20 years.

Table 1: Types of allergy according to age.

Age	Condition										Total	Percentage
	Skin allergy	Allergic bronchitis	Laryngo-bronchitis	Bronchial asthma	Allergic rhinitis	Others	Urticaria	Sinusitis and bronchitis	Tonsillitis	Contact dermatitis		
5-20		2					1			1	4	10
21-35	1	2	1		5						9	22.5
36-50	7	8		2	2	1		1		1	22	55
51-65	1	3							1		5	12.5
Total	9	15	1	2	7	1	1	1	1	2	40	100

Table 2 clarifies the outcomes according to gender. Allergic bronchitis was reported in 10 cases (25%) as the highest percent in males. While in females, allergic bronchitis and allergic rhinitis showed the highest percent (12.5%). Generally, allergic bronchitis is the most frequent in both males and females represented by 37.5%. Table 3 shows the findings in terms of the negativity and positivity of IgE. Skin allergy, allergic rhinitis, and allergic bronchitis were positive; while other conditions revealed negative results (55%).

Table 2: Types of allergy according to gender.

Condition	Male	%	Female	%	Total	%
Skin allergy	6	15	3	7.5	9	22.5
Allergic bronchitis	10	25	5	12.5	15	37.5
Laryngobronchitis			1	2.5	1	2.5
Bronchial asthma			2	5	2	5
Tonsillitis	1	2.5			1	2.5
Urticaria			1	2.5	1	2.5
Allergic rhinitis	2	5	5	12.5	7	17.5
Contact dermatitis			2	5	2	5
Sinusitis and bronchitis	1	2.5			1	2.5
Others			1	2.5	1	2.5

Total	20	50	20	50	40	100
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Table 3: Frequency of allergic tests among different allergic conditions.

Condition	Positive	%	Negative	%	Total	%
Skin allergy	6	15	3	7.5	9	22.5
Allergic bronchitis	9	22.5	6	15	15	37.5
Laryngobronchitis	None		1	2.5	1	2.5
Bronchial asthma	None		2	5	2	5
Tonsillitis	None		1	2.5	1	2.5
Urticaria	None		1	2.5	1	2.5
Allergic rhinitis	3	7.5	4	10	7	17.5
Contact dermatitis	None		2	5	2	5
Sinusitis and bronchitis	None		1	2.5	1	2.5
Others	None		1	2.5	1	2.5
Total	18	45	22	55	40	100

4. Discussion

Diseases of allergy represent conditions resulted from the immune system hypersensitivity, which could be antibodies or cell-mediated. Typically, in most cases, the antibody is responsible for an allergic reaction belonging to the IgE isotype, and the individual is an indication of suffering from an IgE mediated allergic disease. In this study, 20 (50%) male patients and 20 (50%) female patients with ages ranging between 5 and 65 years were enrolled . Most of the cell-mediated patients were over 30 years of age.

The majority of cases were recorded for allergic bronchitis represented by 15 (37.5%), followed by skin allergy with 9 (22.5%) cases, allergic rhinitis with 7 (17.5%) cases, and 2 (5%) cases for each of bronchial asthma and contact dermatitis. The lowest number represented by only 1 (2.5%) case was reported for each of the laryngobronchitis, urticaria, tonsillitis, sinusitis and bronchitis and others. According to this study, most of the cases were found in patients whose ages ranged between 36 and 50 years.

The frequency of IgE negativity was more than the positivity. Concerning gender, female patients were equal to males. After comparing the result with that of [10], we found that IgE is more common in females (the sample size is 3.721, the total numbers of females and males are 2.013 (54.1%) and 1.708 (45.9%), respectively).

In this work, regarding the age group, it was more common in the age group of 36-50 years represented by (55%). By contrast, in the previous study, it was more common in the age group of 40-49 years (total number is 612 represented by 16.4%). This disagreement in the results of age and gender found in this study, and the previous one is due to variability in the sample size of the current study, which was small, as well as seasonal and socioeconomic variations.

Regarding the frequency of allergic tests, both studies were identical in terms of the negativity of serum IgE was more common. This study reported 22 negative cases (55%); while the previous study reported 2.506 negative cases (67.3%) [11][12].

5. Conclusion

This study demonstrated the low frequency of allergic diseases in children and young people; however, this was high in old people whose ages ranged between 36 and 50 years. Most of the cases were allergic bronchitis and skin allergy. Regarding gender, both males and females showed equal results (the total number of each gender was 20 represented by 50%). Most of the serum IgE test was negative.

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