

## Immunoglobulins assessment (IgE,G,A,M) in some Iraqi patients with acute and chronic urticaria

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Received 11, May, 2009

Accepted 18, October, 2009

### Abstract:

60 patients diagnosed as having urticaria were included in the study ; 30 patients were effected with acute urticaria and 30 patients were affected with chronic urticaria. In addition, 30 healthy adult volunteers were selected as control group .The patients and control groups sera were examined with enzyme linked immunosorbent assay ( ELISA) to detect total level IgE and radial immunodiffusion (RID) to detect levels of IgG , IgA and IgM . The total level of IgE in acute urticaria (  $1.45\pm 0.13$ ) IU/mL and chronic urticaria ( $2.12 \pm 0.10$ ) IU/mL patients were significantly higher than the control groups (  $0.85 \pm 0.10$ )IU/mL ( $p<0.05$ ). The level of IgG in acute urticaria (  $12.5\pm 0.42$ ) g/L and chronic ( $13.16\pm 0.40$ ) g/L patients , IgA in acute ( $2.5\pm 0.2$ )g/L and chronic ( $2.39\pm 0.19$ )g/L patients , and IgM in acute ( $1.75\pm 0.11$ )g/L and chronic ( $1.47 \pm 0.07$ )g/L , patients were also significantly higher the control groups (  $9.79\pm 0.81$ ) g/L,( $1.63\pm 0.14$ )g/L and ( $1.19\pm 0.07$ ) g/L respectively .

The level of IgE was higher in the chronic urticaria patients than the acute urticaria stressing the importance of type-I hypersensitivity reaction in chronic urticaria .While the level of IgM was significantly higher in the acute urticaria patients than the chronic urticaria which may suggest that some cases of acute urticaria were caused by acute infections .

**Key words:** Acute urticaria, chronic urticaria, immunoglobulines.

### Introduction:

Ordinary urticaria is among the most common skin diseases encountered in medical practice, it affects 15% to 25% of people at some point in their life time [1]. It is a vascular reaction pattern characterized by transient, erythematous swelling of the skin and / or mucous membranes .These swellings represent localized areas of edema , due to extravasation of protein rich fluid from the dilated blood vessels and are termed wheals .They resolve in a few hours with the resorption of the extravasated fluid and may develop on any part of the body [2] .Urticaria is classified according to its duration into acute which stays less

than 6 weeks [3], type I hypersensitivity reaction is probably responsible for most cases of urticaria [4].Circulating antigens such as foods , drugs or inhalants interact with cell membrane bond IgE to release histamine [4] .Chronic urticaria lasts for more than 6 weeks [3]. Urticaria could be mediated by immunological or non –immunological Mechanisms , Interaction of allergens with IgE/IgE receptor (Fc epsilon RI) at the surface of mast cells and basiphils has been postulated as the main immunological type [5],[6] .The presence of circulating (IgG) antibodies ) to IgE or the IgE receptor may contribute to the

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generation of chronic urticaria and release of histamine [7]. In the present study IgE, IgG, IgA, IgM were measured in the serum of patients with acute and chronic urticaria and compared with the control, to determine the importance of these immunoglobulines.

### Materials and Methods:

A total of 60 patients with urticaria were recruited from the Department of Dermatology at the Medical City Teaching Hospital Baghdad during the period from November 2007 to June 2008. Thirty patients were selected with acute urticaria and 30 patients with chronic urticaria. In addition 30 adult healthy volunteers were chosen as a control group.

Quantitative Determination of IgE in human sera was performed by Enzyme linked immunosorbent assay (ELISA) manufactured by (Monobind, U.S.A).

All reagents and patients sera and control were incubated at room temperature and the microplate was prepared which contains the wells. The results were read using a microplate reader with a wave length of 450 nm, by comparing the optical density of the sera with the standard.

Quantitative determination of IgG, A, M was done by radial immunodiffusion (RID) manufactured by (Bindarid, U.K).

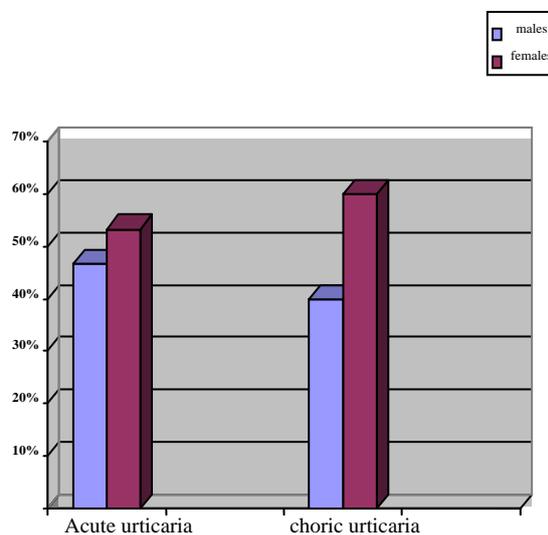
The serum was put into wells, plates after incubation at  $24^{\circ}\text{C}$  for 48 hours (IgA, IgG) and 72 hours for (IgM). The diameter of the formed ring around the well was measured and compared to the test kit.

Statistical analysis. The results were analyzed using (SPSS) package t-test was used to compare the results p value of  $< 0.05$  was considered to significant.

### Results:

Relationship between sex and urticaria: Both acute and chronic urticaria were more prevalent among females. Acute urticaria affected 16 females (53.33%) and 14 males (46.66%). While chronic urticaria affected 18 females (60%) and 12 males (40%) (Fig -1).

About their ages acute urticaria patients ages ranged from 10- 64 years, with a mean  $\pm$  SD of ( $36 \pm 13.76.5$ ) years, chronic urticaria patients ages ranged from 17- 61 years ( $34.9 \pm 11.73$ ) years and control groups ages ranged from 15-47 years ( $27.13 \pm 9.18$ ) years.



**Fig .1 : Relationship between sex and percentage of total number of patients with acute and chronic urticaria .**

**Table. 1: Immunoglobulins levels in patients with acute urticaria chronic urticaria and control presented mean  $\pm$  standard error**

	IgE(Iu/mL)	IgG(g/L)	IgA(g/L)	IgM(g/L)
Acute urticaria	1.45 $\pm$ 0.13	12.51 $\pm$ 0.42	2.5 $\pm$ 0.2	1.75 $\pm$ 0.11
Chronic urticaria	2.12 $\pm$ 0.18	13.16 $\pm$ 0.40	2.39 $\pm$ 0.19	1.47 $\pm$ 0.07
Control group	0.85 $\pm$ 0.10	9.79 $\pm$ 0.81	1.63 $\pm$ 0.14	1.19 $\pm$ 0.07

### IgE level :

Total IgE level was elevated in both acute ( $1.45 \pm 0.13$ ) Iu/mL and chronic ( $2.12 \pm 0.18$ ) Iu/mL urticaria patients as compared to the control group ( $0.85 \pm 0.10$ ) Iu/mL. ( $P < 0.05$ ) It

was higher in patients with chronic urticaria as compared to those with acute urticaria. The difference was statistically significant ( $p < 0.05$ ) (Table-1).

#### **IgG level :**

IgG level was higher in both patients with acute ( $12.50 \pm 0.42$ ) g/L and chronic urticaria ( $13.16 \pm 0.40$ ) g/L urticaria when compared with control group ( $9.79 \pm 0.18$ ) g/L ( $P < 0.05$ ). However there was no significant differences between the acute and chronic urticaria (table -1).

#### **IgA level :**

The level of IgA in acute ( $2.5 \pm 0.2$ ) g/L and chronic ( $2.39 \pm 0.19$ ) g/L urticaria patients was higher than the control ( $1.63 \pm 0.14$ ) g/L ( $p < 0.05$ ), but there were no significant differences between acute and chronic urticaria (table -1).

#### **IgM level**

Serum IgM was higher in patients with acute urticaria ( $1.75 \pm 0.11$ ) g/L and chronic urticaria ( $1.47 \pm 0.07$ ) g/L than the control ( $1.19 \pm 0.07$ ) g/L ( $p < 0.05$ ). Patients with acute urticaria had significantly higher IgM than chronic urticaria (table -1).

#### **Discussion:**

Although immunological factors are very important in the pathogenesis of urticaria [8]. Few studies have dealt with immunological changes in Iraqi patients [9].

In the present study IgE, G, A and M were measured in the sera of patients with acute and chronic urticaria and were compared with control group. Regarding IgE, the level was significantly higher in patients with acute and chronic urticaria when compared with the control. This result agrees with the role of type I- hypersensitivity reaction in the pathogenesis of urticaria [4]. The elevated IgE level point to the

importance of type-I hypersensitivity reaction in the etiology of both acute and chronic urticaria as it was found to be elevated in both types. It was significantly higher in patients with chronic urticaria than the acute type, which stresses the importance of type I- hypersensitivity reaction in chronic urticaria. The level of IgG, IgA and IgM were all elevated in patients with acute and chronic urticaria when compared to the control. This can be explained by the role of immunoglobulin especially IgG as auto antibodies to IgE or IgE receptors [10]. IgM was found to be higher in patients with acute urticaria than chronic urticaria. Since IgM was elevated in many acute infections the higher level of IgM in acute urticaria could be related to the presence of acute infection in these patients.

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## تقييم الكلوبولينات المناعية (M,A,G,IgE) في بعض المرضى العراقيين المصابين بالارتيكاريا الحادة والمزمنة

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### الخلاصة :

تضمنت هذه الدراسة تشخيص (60) مريضاً مصابين بالارتيكاريا ، منهم (30) مريضاً يعانون من الارتيكاريا الحادة و (30) مريضاً يعانون من الارتيكاريا المزمنة ، اضافة الى (30) من المتطوعين البالغين الاصحاء اختيروا كمجموعة سيطرة . تم فحص مصل المرضى ومجموعة السيطرة بأختبار الامتزاز المناعي المرتبط بالانزيم (ELISA) لتحديد المستوى الكلي للـ IgE والانتشار المناعي الشعاعي (RID) لتحديد مستويات IgM , IgA , IgG . المستوى الكلي للـ IgE في مرضى الارتيكاريا الحادة (0.13±1.45) وحدة دولية /مل وفي مرضى الارتيكاريا المزمنة (0.10±2.12) وحدة دولية / مل ارتفع معنوياً مقارنة بمجموعة السيطرة (0.10±0.85) وحدة دولية / مل (p<0.05) . أن مستوى IgG في مرضى الارتيكاريا الحادة (0.42±12.5) غرام/لتر ومرضى الارتيكاريا المزمنة (0.40±13.16) غرام/لتر ، IgA في مرضى الارتيكاريا الحادة (0.2±2.5) غرام/لتر وفي مرضى المزمنة (0.19±2.39) غرام/لتر ، وIgM في مرضى الحادة (0.11±1.75) غرام /لتر وفي مرضى المزمنة (0.07±1.47) غرام/لتر كذلك ارتفع معنوياً مقارنة بمجموعة السيطرة (0.81±9.79) غرام/لتر ، (0.14±1.63) غرام و (0.07±1.19) غرام/لتر علي التوالي . مستوى الـ IgE ارتفع في مرضى الارتيكاريا المزمنة مقارنة بالارتيكاريا الحادة ليبين اهمية تفاعل فرط الحساسية النوع الاول في الارتيكاريا المزمنة . بينما مستوى الـ IgM ارتفع معنوياً في مرضى الارتيكاريا الحادة مقارنة بالارتيكاريا المزمنة يوحي بان بعض حالات الارتيكاريا الحادة قد تحدث بفعل الاخماج الحادة .