

Study of Seru for Some Immune Factors in Thyroiditis Disease Patients

Zainab A. Fadhil¹, Ibtesam B. Hassan^{1*}, Anwer N. AI Qaym²

¹*Department of biology, College Of Education for pure Sciences .University of Diyala, Iraq*

²*Baquba Teaching Hospital, Diyala ,Iraq*

*Corresponding aouther: ibtesambh67@gmail.com.

Abstract

Abstract. thyroiditis disease is an autoimmune inflammationIt has genetic, clinical, pathological, and immunological features, and it goes through alternating phases of healing and relapse.The aim of this study was to assess the immunological status of some Iraqi Thyroiditis patients . The present study was conducted on a groups of patients . This study was conducted for a period from the beginning of October 2020 to the end of January 2021, as blood samples were collected from patients with thyroiditis, as well as healthy people from Baquba Teaching Hospital and Al-Batoul Hospital Education Feminine & Pediatric in DiyalaGovernorateaged 27 female and 3 males healthy participants included in this study as a control group. Their ages ranged between (18-45) years.Hyperthyroidism Group 25 female and 5 males patients.Their ages ranged between (23-60) years.Hypothyroidism Group 30 female patients. Their ages ranged between (21-60) years. The research looked into the relationship between immunological detection of Immunoglobulin E cellular motility and the ELIZA technique.The current study's findings revealed a significant increase in the level of Immunoglobulin E concentration in the serum of patients with (438.64 ± 52.54) ng/ml when compared with control group (365.61 ± 19.13) ng/ml.at a probability level (P< 0.026). While the result revealed that there was no significant decrease in serum Immunoglobulin E level in hypothyroidism group (339.35 ± 13.24) ng/ml and when compared with the control group (365.61 ± 19.13) ng/ml . These findings suggest that Immunoglobulin E might have a role in etiopatho genesis of Thyroiditis disease

Key words: *Hypothyroidism, Hyperthyroid,Immunoglobulin E*

Introduction

Immunoglobulin E is produced by IgE-secreting plasma cells and B cells subsequent to initial allergen exposure, sensitization and re exposure. IgE is normally present in the serum at very low levels but it can be significantly elevated in atopic patient Soluble iso forms of three human IgE Fc receptors, namely FcεRI, FcεRII and galectin-3, can be found in serum. These soluble IgE receptors are a diverse family of proteins unified by the characteristic of interacting with IgE in the extracellular matrix the high affinity IgE

receptor has recently been described as a soluble isoform (sFcεRI). (Platts-Mills, 2001 ; Platzer et al., 2011).

IgE's main function is immunity to parasites such as helminths like *Schistosomamansoni*, *Trichinellaspiralis*, and *Fasciola hepatica* ,IgE is utilized during immune defense against certain protozoan parasites such as *Plasmodium falciparum*. IgE may have evolved as a last line of defense to protect against venoms .(Watanabe et al.,2005; Duarte et al.,2007; Palm et al.,2012 ; Marichal et al .,2013). IgE also has an essential role in type I hypersensitivity It has been observed recently that the recurrence of it is possible to cause Graves' disease via pollen allergy. Linked with IgE synthesis. Therefore, IGE may Plays a role in hyperthyroid induction and maintenance Disease of Graves .Studies in several ethnic groups have reported a high incidence of elevated levels of IgE in autoimmune thyroid disease patients, particularly in diseases of Graves' (Sato,1999;komiya et al., 2001 ;Gould er al., 2003; Fitzsimmons et al.,2006 ; Erb , 2007).

A study pointed (Latifi - Pupovci et al.,2014).In Albanian patients with ATD there is no elevation of IgE levels. This could be the result of low prevalence of allergic diseases in Albanian population determined by genetic and environmental factors.

Materials and Methods

Subjects

This study was conducted for a period from the beginning of October 2020 to the end of January 2021, as blood samples were collected from patients with thyroiditis, as well as healthy people from Baquba Teaching Hospital and Al-Batoul Hospital Education Feminine & Pediatric in Diyala Governorate. After the diagnosis by taking laboratory analyzes TSH ,T3, T4 and Specialist physician and divided into three study groups have been investigated. An informed consent was obtained from all patients.

Control Group: 27 female and 3 males healthy participants included in this study as a control group. Their ages ranged between (18-45) years.

Hyperthyroidism Group:25 female and 5 males patients . Their ages ranged between (23-60) years.

Hypothyroidism Group: 30 female patients. Their ages ranged between (21-60) years.

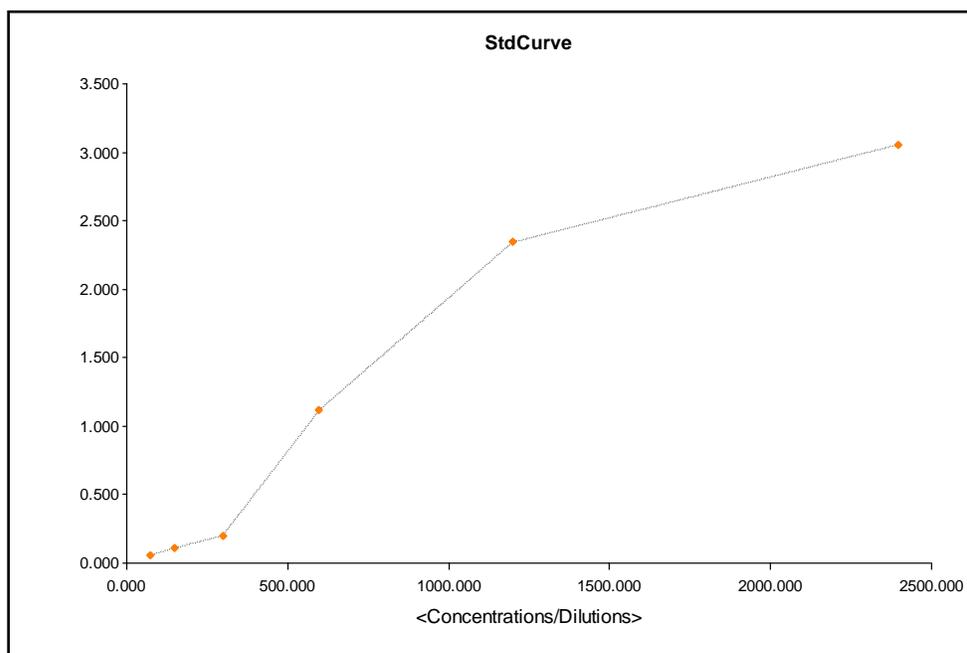
Collection of Blood Samples

Three Samples were collected by drawing venous blood .Where (5ml) of blood was withdrawn by using plastic medical syringes after sterilization of the drawing area with ethyl alcohol at a concentration of (70%), and the drawn blood was placed in the test tubes, and the samples were left for (15) minutes at room temperature to avoid clotting.Then the serums were separated by a centrifuge for a period of (5) minutes at a

rate of (3000 revolutions / minute). Then divide the serum into equal quantities (250 μ l) in small tubes (Eppendroff) .And store it at a temperature (20 -C °) until use .Each section of the conserved serum was used once to avoid repeated thawing and freezing of the model. For the purpose of measuring the concentration level of Immunoglobulin E by using the sandwich ELISA test.

Assay procedure

The test was performed according to assay procedure Mentioned in the kit Human Immunoglobulin E ELISA in China .Shangha



Figuer(1_1) Standard curved forImmunoglobulin E

Statistical analysis:

The IBM SPSS computer program version 26.0 (IBM Corp, 2019) .was used to analyzed the parametric data, mean \pm SE, Independent T-test was used to calculate the probability. While, WinPepi computer program version 11.65 (Abramson, 2011). was used to calculate the probability of the non-parametric data by using Chi-square test.

Results and Discussion:

The results in Table (1_1) showed that there was a non-significant decrease in serum IgE level in hypothyroidism group (339.35 ± 13.24) ng/ml and when compared with the control group (365.61 ± 19.13) ng/ml . while the result revealed that there were a significant ($P < 0.026$) increase in serum IgE level in hyperthyroidism group (438.64 ± 52.54) ng/ml when compared with control group (365.61 ± 19.13) ng/ml.

Table (1-1): Serum concentrations of *Immunoglobulin E* in hypothyroidism, hyperthyroidism groups and with control group .

Groups	Gender	Mean \pm Std. Error of Mean	probability
Control	Male	307.30 \pm 1.71	0.973
	Female	372.08 \pm 20.92	
	Total	365.61 \pm 19.13	A
Hypothyroidism	Female	339.35 \pm 13.24	
	Total	339.35 \pm 13.24	A
Hyperthyroidism	Male	654.74 \pm 215.09	0.026
	Female	395.42 \pm 44.65	
	Total	438.64 \pm 52.54	A

● **Values are Mean \pm SE.**

● Tukey test: similar letters referred to non- significant differences ($P > 0.05$) while the different letters referred to a significant differences ($P < 0.05$).

The results of the current study agree with the results (Latifi-pupovci et al.,2014)A study was conducted on Albanian patients comparing Graves' and Hashimoto with respect to IgE, where the study found that there is an increase in the Graves group in its concentration and control, while no differences were recorded between HashimotoDue to the result of genetic and environmental factors associated with allergic diseases

There are studies that have found elevated levels of IgE in patients with Craves disease (Inoue et al., 1989; sato et al.,1999;Yamada et al.,2002 ; Kim et al., 2002; Yamada et al.,2006)And they found low levels of igE concentration in patients with Hashimoto thyroiditis(Matsui et al.,1978;Sato et al .,1999) .It agrees with the current study.

The current results are a low IgE concentration level in Hashimoto' thyroiditis. Because the patients do not have sensitivity due to the dose, Given by the doctor periodically resulting in a lowering of the IgE concentration.

Type 1 hypersensitivity allergic reactions are mediated by IgE. IgE levels in the blood are usually very low (100,000 times lower than IgG), but they can spike drastically in allergic conditions like bronchopulmonaryaspergillosis or parasitic diseases like schistosomiasis. Mucosal areas, especially the respiratory tract, contain IgE plasma cells, The gastrointestinal tract, where secreted IgE can mediate the expulsion of parasitic worm infestations, and the skin, where secreted IgE mediates allergic reactions. IgE has a 2--3 day half-life in plasma, but when it binds to the Fc receptor FcRI on the surface of mast cells, basophils, or dendritic cells, it extends to 2--3 weeks. Changed Words Structural Changes Thesaurus Rephrase (van et al., 2014).

Conclusions

1- that there was no significant decrease in serum Immunoglobulin E level in hypothyroidism group.

2- the result revealed that there were a significant increase in serum Immunoglobulin E level in hyperthyroidism group.

References

1. Matsui, Y., Heiner, D. C., & Beall, G. N. (1978). *IgE and IgE Autoantibodies in Patients with Autoimmune Thyroid Disorders and Their Relatives. Experimental Biology and Medicine*, 158(1), 73–76. doi:10.3181/00379727-158-40142
2. Kim, H. Y., Park, K. P., Kim, S. H., Kim, J. Y., Song, S. K., Choi, Y. S., & Park, Y. H. (2002). The Relationship between Graves' Disease and Serum Immunoglobulin E. *J Korean Endocr Soc*. 17(5):640-648.
3. Van der Burg, M., Weemaes, C. M. R., & Cunningham-Rundles, C. (2014). *Isotype Defects. Stiehm's Immune Deficiencies*, 389–408. doi:10.1016/b978-0-12-405546-9.00016-9
4. Inoue, M., Rakugi, H., Nakamaru, M., Masugi, F., Ogihara, T., & Takai, S. (1989). Graves' disease with markedly elevated serum immunoglobulin E. *Nihon Naibunpi Gakkai Zasshi* 65 (11), 1264-1269
5. Sato, A., Takemura, Y., Yamada, T., Ohtsuka, H., & Sakai, H. (1999). A possible role of immunoglobulin E in patients with hyperthyroid Graves' disease. *The Journal of Clinical Endocrinology & Metabolism* 84 (10), 3602-3605
6. Latifi-Pupovci, H., Gacaferri-Lumezi, B., & Lokaj-Berisha, V. (2014). *There Is No Elevation of Immunoglobulin E Levels in Albanian Patients with Autoimmune Thyroid Diseases. Journal of Thyroid Research*, 2014, 1–5. doi:10.1155/2014/283709
7. Yamada, T., Sato, A., Komiya, I., Nishimori, T., Ito, Y., Terao, A., Eto, S., & Tanaka, Y. (2000). An Elevation of Serum Immunoglobulin E Provides a New Aspect of Hyperthyroid Graves' Disease. *The Journal of Clinical Endocrinology & Metabolism*, 85(8), 2775–2778. doi:10.1210/jcem.85.8.6741
8. YAMADA, T., KOMIYA, I., MIYAHARA, Y., KOMATSU, M., SHIMA, I., INAZAWA, T., & AIZAWA, T. (2006). *Effect of Methimazole Treatment for 2 Years on Circulating IL-4, IgE, TBII, and TSAbs in Patients with Hyperthyroid Graves' Disease. Endocrine Journal*, 53(6), 783–788. doi:10.1507/endocrj.k06-054
9. Flecha, A.J.; Genaro, A.M.; Lysione, K.A.M.; Caro, R.A. Coluccia, A.G. & Cremaschi, G.A. (2000). Experimental evidence pointing to the bidirectional interaction between the immune system and the thyroid axis. *Int. J. Immuno. pharmacol.*; 22:491–500.

10. Latifi-Pupovci, H., Gacaferri-Lumezi, B., & Lokaj-Berisha, V. (2014). There Is No Elevation of Immunoglobulin E Levels in Albanian Patients with Autoimmune Thyroid Diseases. *Journal of Thyroid Research*, 2014, 1–5. doi:10.1155/2014/283709
11. Sato, A., Takemura, Y., Yamada, T., Ohtsuka, H., Sakai, H., Miyahara, Y., Aizawa, T., Terao, A., Onuma, S., Junen, K., Kanamori, A., Nakamura, Y., Tejima, E., Ito, Y., & Kamijo, K. (1999). A Possible Role of Immunoglobulin E in Patients with Hyperthyroid Graves' Disease. *The Journal of Clinical Endocrinology & Metabolism*, 84(10), 3602–3605. doi:10.1210/jcem.84.10.6038
12. Komiya, I., Yamada, T., Sato, A., Kouki, T., Nishimori, T., & Takasu, N. (2001). Remission and Recurrence of Hyperthyroid Graves' Disease during and after Methimazole Treatment When Assessed by IgE and Interleukin 13. *The Journal of Clinical Endocrinology & Metabolism*, 86(8), 3540–3544. doi:10.1210/jcem.86.8.7734
13. Erb, K. J. (2007). Helminths, allergic disorders and IgE-mediated immune responses: Where do we stand? *European Journal of Immunology*, 37(5), 1170–1173. doi:10.1002/eji.200737314
14. Gould, H. J., Sutton, B. J., Beavil, A. J., Beavil, R. L., McCloskey, N., Coker, H. A., Fear, D., & Smurthwaite, L. (2003). THE BIOLOGY OF IGE AND THE BASIS OF ALLERGIC DISEASE. *Annual Review of Immunology*, 21(1), 579–628. doi:10.1146/annurev.immunol.21.120601.1411
15. Palm, N. W., Rosenstein, R. K., & Medzhitov, R. (2012). Allergic host defences. *Nature*, 484(7395), 465–472. doi:10.1038/nature11047
16. Fitzsimmons, C. M., McBeath, R., Joseph, S., Jones, F. M., Walter, K., Hoffmann, K. F., Curtis Kariuki, H., Mwatha, J. K., Kimani, G., Kabatereine, N. B., Vennervald, B. J., Ouma, J. H., & Dunne, D. W. (2006). Factors Affecting Human IgE and IgG Responses to Allergen-Like Schistosoma mansoni Antigens: Molecular Structure and Patterns of in vivo Exposure. *International Archives of Allergy and Immunology*, 142(1), 40–50. doi:10.1159/000095997
17. Marichal, T., Starkl, P., Reber, L. L., Kalesnikoff, J., Oettgen, H. C., Tsai, M., Metz, M., & Galli, S. J. (2013). A Beneficial Role for Immunoglobulin E in Host Defense against Honeybee Venom. *Immunity*, 39(5), 963–975. doi:10.1016/j.immuni.2013.10.005
18. Duarte, J., Deshpande, P., Guiyedi, V., Mécheri, S., Fesel, C., Cazenave, P.-A., Mishra, G. C., Kombila, M., & Pied, S. (2007). Total and functional parasite specific IgE responses in Plasmodium falciparum-infected patients exhibiting different clinical status. *Malaria Journal*, 6(1), 1. doi:10.1186/1475-2875-6-1

19. Watanabe, N., Bruschi, F., & Korenaga, M. (2005). IgE: a question of protective immunity in *Trichinella spiralis* infection. *Trends in Parasitology*, 21(4), 175–178. doi:10.1016/j.pt.2005.02.010
20. Platzer, B.; Ruiter, F.; van der Mee, J. and Fiebiger, E. (2011). Soluble IgE receptors--elements of the IgE network. *Immunol. Lett.*;141(1): 36-44.
21. Platts-Mills, T.A. (2001). The role of immunoglobulin E in allergy and asthma. *Am. J. Respir. Crit Care Med.*; 164(8 Pt 2): S1-5.
22. IBM Corp., 2019. IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp.
23. Abramson, J.H. 2011. WINPEPI updated: computer programs for epidemiologists, and their teaching potential. *Epidemiologic Perspectives & Innovations*, 8:1.,