

Study of Some Biochemical Variables in the Blood Serum of Patients with Hyperthyroidism

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Abstract: *Thyroid disease is a common problem that can cause symptoms under hypertension or thyroid disease. The thyroid gland is one of the largest endocrine glands in the human body and is located in the lower part of the neck under the Adam's apple. It is an essential organ for the production of thyroid hormones, which maintain metabolism in the body. One of its symptoms is an enlarged thyroid gland in the neck, which is directly related to an increase in the size of the gland (difficulty swallowing and discomfort in the anterior part of the neck). When studying some biochemical variables in the blood serum of patients with hyperthyroidism, the study included 30 blood samples from people with hyperthyroidism versus 30 blood samples from healthy people (as a control group). The results showed a high moral rise $p < 0.001$. In the concentration of triiodothyronine hormone T3 and thyroxine T4 for the pathological group compared to the control group, a significant decrease in the concentration of thyroid-stimulating hormone TSH, and the absence of significant differences in concentrations of albumin and sodium ions, potassium and chloride. Iodine is the main ingredient that works on the formation of both the hormone T3 (T4), and its deficiency. It leads to a malfunction of the gland and this is reflected in the form of a deficiency in the formation of its hormones and to compensate for this deficiency increases the secretion of iodine, which in turn leads to the enlargement of the thyroid gland and increase its weaving and this condition is called goiter. Thyroid hormone is important at the cell level, affecting almost all types of tissue in the body. It controls the frequency (speed) of all vital processes in the body and this is called the pace of metabolism.*

Keywords: Thyroid disease - thyroid hormone - serum - iodine - concentration of stimulating hormone - Thiruksin T4 - Yudo Thrones Triple T3

1. Introduction

Because they influence nearly all of the body's cells and tissues and alter key functions, thyroid diseases are a serious and prevalent disease worldwide.

It plays an important role in maintaining metabolism in the body, the central nervous system and the anterior pituitary gland and influencing breathing, the intestinal and gastric systems and influencing muscle functions, sexual function, endocrine glands, plasma proteins as well as various metabolic mechanisms. [1]

Such as its effect in the discharge of the body's basic energy used to metabolize proteins, carbohydrates and fats .[2] The thyroid gland is essential for life because its absence causes mental and physical slowness and poor resistance to cold. It causes stunting in children and mental retardation, and on the contrary causesthyroid to lose weight and nervousness, increase the speed of heartbeat, tremor and increase temperatures. [3]

The lodient gland differs from the other endocrine glands in that it can be identified as having allergies during a routine physical examination. It also has the unusual ability to store its hormones for three months inside the thyroid follicle lumen in humans, whereas other endocrine organs do so inside the cells themselves.

T4 is secreted in larger quantities than T3, but some tissues, especially the liver or kidney, convert most of the T4 hormone to T3 hormone by enzymes that remove a single

iodide atom, and this process is important because T3 is more active than T4, meaning that T4 becomes more effective after it is converted to T3 [4] either the thyroid or raves disease (attributed to its detector) The eyes may appear larger due to the enlargement of the eye muscles pulling the eye forward; it is the most frequent manifestation or cause of the gland's hyperactivity. In some cases, one or both eyes may protrude forward; these can only be fixed surgically by releasing pressure inside the eye cavity.

In order to maintain the normal level of metabolic activities in the body, limited amounts of thyroid hormones must be provided at all times and this is done through the mechanism of negative retroactivity by the hypothalamus and the anterior lobe of the pituitary gland, which control the secretion of thyroid hormones .[5]

2. Previous Studies

The physiological changes that are seen in hyperthyroidism patients are shared by the hormones of the hypothalamus gland - the pituitary gland- the thyroid gland in the regulation of the vital function of the body by stimulating some hormones and inhibiting others through the mechanism of feedback and that the occurrence of any imbalance in this hormonal balance leads to the development of goiter. The current study, which included the study of the effect of hyperthyroidism on some physiological changes, included measuring the concentration of hemoglobin, the number of leukocytes, the number of erythrocytes and thyroid hormones, where (50) blood samples were taken from women with goiter aged between (30-55) compared to

(50) blood samples from a healthy woman between the ages of (30-55) control group and the results showed the following:

Significant decrease ($p < 0.05$) in erythrocyte count of infected women compared to the control group. A significant rise ($p < 0.05$) in the rate of concentration of free T3, free T4 and a significant decrease in the hormone TSH for infected women compared to the control group. A significant decrease ($p < 0.05$) in the number of leukocytes of infected women compared to the control group. A significant decrease ($p < 0.05$) in the rate of hemoglobin concentration of hyperthyroidism patients compared to the control group. [6]

This study was designed to investigate the effect of hyperthyroidism on some hormones (thyronine, thyroxine, thyroid stimulating hormone) and biochemical variables (creatinine, magnesium). The study included 58 samples aged (25-40) years. Samples were obtained from patients visiting a private laboratory in Samarra. It was also confirmed that the patients were free of chronic diseases, most of the patients were close to the Samarra Pharmaceutical Laboratory and all of them were from the city of Samarra. The samples were divided into two groups, with 29 samples for each group, and the totals were as follows:

The control group, and patient group. The level of triiodothyronine (T3), tetraiodothyronine (T4), and thyroid stimulating hormone, as well as creatinine, and magnesium concentration (MG) were measured. The results of the study showed a significant increase in the level of hormones T3, T4 and TSH in the group of patients, and the results showed a significant decrease in the level of creatinine and magnesium in the group of patients when compared to the control group. [7]

Evaluation of impacted thyroid illness before and after radioiodine therapy – 131

There are no systemic side effects associated with radioisotope therapy, which is administered orally (either as pills or a liquid) once to significantly diminish or eliminate the hyperactive thyroid gland's function. For more than 50 years, radioactive iodine has been utilized in atomic therapy; the only major contraindications are pregnancy and breast-feeding (because breast tissue also absorbs and concentrates iodine). Once the thyroid activity has decreased, oral hormone replacement therapy is started every day, readily supplying the body with the necessary amount of thyroid hormone. However, a comparative investigation shows that utilizing radioactive iodine to treat hyperthyroidism was associated with a rise in cancer incidence. [8]

The main advantage of treating hyperthyroidism with radioactive iodine is that it tends to be.

It has a much higher success rate than generics. Depending on the dose of radioactive iodine chosen, and the disease under treatment (Graves' disease vs. thyrotoxicosis, vs. hot nodule etc.) the success rate in achieving definitive resolution of hyperthyroidism may range from 75-100%.

The most significant side effect of radioactive iodine in patients with Graves' disease is lifelong hypothyroidism, which warrants daily thyroid hormone therapy. Also, there are indications that some patients with eye symptoms related to the disease, these symptoms worsen after radioactive iodine treatment, which is why some patients need a surgical solution.

Sometimes, some patients may require more than one session of radiotherapy, depending on the type of disease, the size of the thyroid gland, and the first dose of treatment. Many patients are initially unhappy with the idea of needing to take thyroid hormone pills for the rest of their lives. However, exogenous thyroxine is safe, inexpensive, and easy to use, and identical to the thyroid hormone that is naturally made by the thyroid gland, this treatment is extremely safe and highly acceptable by the vast majority of patients. [9]

Hot spot "hot knot" (thyroiditis) can also cause hyperthyroidism. [10]

Toxic thyroid adenoma (most common cause in Switzerland, 53%, thought to be atypical due to low dietary iodine level in this country. [11]

3. Materials and Working Methods

60 blood samples were obtained during the research period, including 30 samples of the disease with thyroid disorders (hyperthyroidism), where samples were collected from the reviewers of consulting clinics in Kirkuk Governorate and for the time period from 31-4-2017 to 16-7-2017.

They were between the ages of 15 and 50 years of age and of both sexes, in addition to 30 blood samples taken from healthy people as a control group and the following checks were performed on her:

- 1) Blood samples were obtained from a vein of 5 ml from each patient, placing the blood in test tubes free of preservatives for the purpose of separating the blood and obtaining serum using a centrifuge, the serum was then withdrawn using Micropipette and the serum was placed in a test tube for biochemical tests.
- 2) The level of albumin was measured using a special measuring kit equipped by the French company Biolap.
- 3) The determination of sodium and potassium in serum was carried out using a special measuring kit equipped by the Spanish company Spain react.
- 4) The concentration of chloride in the serum was estimated using a special measuring kit equipped by the Spanish company Linear.
- 5) The concentration of the hormones TSH, T4, T3 was measured by the measuring kit of the Eliza device equipped by the American company Biocheak.

4. Conclusion

The results of this study showed a high significant increase in the concentration of thyroxine T4 and T3 for the group of patients with hyperthyroidism of women and men compared to the control group while a significant decrease in the

concentration of TSH hormone was observed as in Table 1, which shows the effect of hyperthyroidism on the concentration of hormones T3, T4 and TSH in the blood serum.

Totals	Mean \pm se		
	L)/T3 (mmol/L)	T4(mmol/L)	TSH(mol/L)
Healthy	1.8 \pm 0.5	78.5 \pm 50	30.5 \pm 20
Patients	2.2 \pm 0.9*	101 \pm 10**	3 \pm 1.1**

moral difference * P<0.05

moral difference ** P<0.001

The reason for the higher concentration of thyroxine T4 and T3 in the pathological group compared to the control group while a decrease in the concentration of TSH hormone as in Table 1) may be attributed to the occurrence of hyperthyroidism Thyrotoxicosis

The cause of inflation is due to the direct decrease in the rate of inorganic iodine intake or may be caused by the presence of autoimmune diseases, which is called Graves disease, which is an autoimmune disease characterized by the presence of goiter goiter and the presence of antibodies to the recipients of the hormone TSH in the serum.

Table 2 indicates that there are no significant differences in the concentrations of albumin and sodium and potassium ions and the presence of significant differences in the concentration of chloride.

Table 2: Effect of hyperthyroidism on the concentration of albumin, sodium, potassium and chloride in the blood serum

Totals	(Mean \pm SE			
	Albmin	Serm sodium	Serm potassium	Serm chloried
Healthy	4.3 \pm 0.3	136.3 \pm 3	4 \pm 0.2	1.7 \pm 2
Patients	4.3 \pm 0.6	138 \pm 10	4.3 \pm 0.4	105 \pm 4*

Moral difference * P< 0.05

It should be noted that more than 99% of T3 and T4 are associated with protein, especially α - globulin and thyroxine binding globulin (TBG).

A small part of it is associated with albumin and the remaining small part that is free from T4 and T3H is the one that is physiologically effective.

It matches the results of this search 2012 Marthinez-trigüero et al who found no significant change in the concentration of albumins in patients with hyperthyroidism .

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