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Physiological and Biochemical Study of Number of Hyperthyroidism Patients

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Abstract. This study included 60 sample divided to two groups samples of 30 sample hyperthyroidism and ,30 sample control group, study conducted for the period from 5/9/2020 until 5/12/2021 in the Samarra General Hospital and private laboratories on patients referred to doctors specializing in thyroid disease surgery who were diagnosed by doctors after conducting laboratory analyzes and they were measured by Thyroid hormone concentration (TSH.T3, T4) and blood lipid : blood cholesterol, Triglycerides, HDL-C-, LDL-C.

The results showed a Existence of significant High in the concentration of T3 and T4, accompanied by a significant reduce in the concentration of TSH at a significant level of P <.05 in the study compared to the control, while the results of the lipid profile appearance a significant decrease in the estimation of blood cholesterol, triglycerides and HDL-C, accompanied by a increase Significant in LDL -cholesterol concentrations in patients different to control at a significant level of P <05.

Keywords: TSH, T3,T4,lipid profile,Hyperthyroid.

INTRODUCTION

The thyroid gland is a butterfly-shaped gland that sits just below the Adams apple in the front of the neck. The gland wraps around the windpipe (trachea) and has a butterfly-like shape with two lobes connected by a middle section (isthmus). Thyroid gland are produced by the thyroid gland, which functions like a small factory that uses iodine (mostly from foods like seafood and salt) to do so[1]. These hormones assist in the control of the body's metabolism and affect processes such as growth and other essential body functions [2]. Thyroxine (T4) and tri-Iodothyronin (T3) are the two most effective thyroid hormones (T3), Thyroid hormones account for 99% and 0.1 percent of total hormones in the body, respective. T3 is the hormone with the most biological potency. T4 is transformed to T3 - the active hormone - until it is released into the bloodstream from the thyroid gland, which has an effect on the metabolism of cells all over our body Hyperthyroid is a disorder in which the thyroid hormone are overactive and produces an excessive amount of thyroid hormone.. that circulate through the bloodstream

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("Hyper" in Greek up). Thyrotoxicosis is a toxic disease caused by an excess of thyroid hormones, which can be caused by a variety of factorsThyrotoxicosis may be caused by an excessive intake of thyroid hormone or by the thyroid gland overproducing thyroid hormones.Thyroid-stimulating hormone (TSH) is a glycoprotein hormone made by the anterior pituitary gland. It is the thyroid gland main stimulant.. It also causes thyroid follicular cells to develop, which leads to thyroid enlargement. TSH development is regulated by the hypothalamic-pituitary axis. Neurons in the brain, Thyroid-releasing hormone (TRH) is released by neurons in the hypothalamus, which causes anterior pituitary thyrotrophs to Secretion TSH. in turn, stimulates thyroid follicular cells to release thyroid hormones in the form of T3 or T4. Triiodothyronine, or T3, is the active form of thyroid hormone. Though it represents only 20% of the released hormone, the majority of T3 comes from the peripheral conversion of T4 to T3. [3].

Hyperthyroid is a dysfunction that occurs when the thyroid hormone makes more thyroid gland than the body needs Hyperthyroid is sometimes called thyrotoxicosis, the term for too much thyroid hormone in the blood. Thyroid gland circulation throughout the body in the bloodstream and act on virtually every tissue and cell in the body. Many of the body's activities are sped over in hyperthyroidism. Hyperthyroidism affects about 1% of the population in the England [4]. Exophthalmos disease, for example, is one cause of hyperthyroid., thyroid nodules thyroiditis, or inflammation of the thyroid , consuming too much iodine , overmedicating with thyroid hormone[5].The clinical syndrome of hyperthyroidism is caused by an excess of circulating free thyroxine and free triiodothyronine, or both. Around 2% of women are affected and 0.2% of men The most common causes of Thyrotoxicosis . The most common manifestations of thyrotoxicosis are weight loss in spite of good appetite, goiter (rarely), heat intolerance, osteoporosis , tachycardia (with or without palpitation or atrial fibrillation), anxiety, tremor with hyper-reflexia, sweating, amenorrhea /oligomenorrhea myopathy [6].

METHODS

This study included 60 samples divided to two groups samples of 30 hyperthyroidism patients and ,30 healthy individuals as control, study conducted for the period from 5/9/2020 until 5/12/2021 in the Samarra General Hospital and private laboratories ,patients were diagnosed by doctors after conducting laboratory analyzes and they were measured by Thyroid hormone concentration (TSH.T3, T4) and blood lipid,cholesterol, Triglycerides, HDL-C , LDL-C .

The blood was drawn from the vein using a 5 ml syringe, and the 5 ml was placed in a new, clean, dry, plastic tube free of anti-clotting material for the purpose of estimating the concentrations of hormonal variables. TSH, T3, and T4 hormone concentrations were measured by ELISA technique by using its Kits. As for the lipid profile, it was

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done using the Enzymatic Methods method by using the ready-made Kits kit manufactured by various international companies. The results were also analyzed statistically using the variance test and at a probability level (P <0.05). [7].

Result and Discussion

From Table (1) The results showed a Existence of significant increase estimation of T3 , T4 accompanied by a significant reduce in TSH when comparing the two groups of patients and control at a significant level of p <05. The results of this study agree with [8]. the increase in the over activity of tissues within the thyroid gland leads to an increase in production in the hormones T3, T4. Hyperthyroidism in humans is accompanied by endocrine abnormalities with increased energy expenditure and consequently the use of essential substances for metabolism [9].Hyperthyroid is characterized by a decrease in TSH corresponding to an increase in T3, T4. Thyroid gland affect all aspects of lipid metabolism in terms of Building, excretion, and motility [10].

As for Table (2) the results showed a significant reduce in the concentration of blood cholesterol, Triglycerides, and HDL –C, accompanied by a significant increase in Low-Density Lipoproteins of cholesterol when comparing the two groups of hyperthyroidism and control at a significant level.P<0.05).

The results of this study agree with [11]that reported hyperthyroidism is associated with a reduce in total cholesterol concentration. The cause for low cholesterol due to the speed of clerance[12],and with stimulation of thyroid hormones to reduce HMG-COA The first step in cholesterol formation [13]and thus increases the LDL-C receptors, which leads to a decrease in the cholesterol concentration [14].Hyperthyroid is associated with low cholesterol [15].Also,a significant reduce in the estimation of Triglycerides was observed, and the results of this study agree with [16],because thyroid hormones affect the activity of the enzyme Lipoprotein lipase, which is an essential enzyme and necessary to remove triglycerides from chylomicron and VLDL and LPL stimulates the decomposition of triglycerides into fatty acids and chlorides, as well as T3 plays a role in the regulation of triglycerides through the concentration of Apo lipoprotein [17] .

Thyroid gland can influence HDL-C metabolism by increasing the activity of a cholesterol transporter protein (CETP) that transports cholesterol esters from HDL-2 - VLDL and Triglycerides and in the opposite direction [18].

The results of this study are in agreement with[19], who indicated an increase in LDL-C in hyperthyroidism, that an increase in hyperthyroidism leads to an increase in LDL-C oxidation, and thus an increase in LDL-C. T4 [20]In hyperthyroidism, LDL-C increases in concentration due to an increase in its receptors.

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Table (1) Concentration of thyroid hormones for hyperthyroidism and control group

Thyroid gland	Control	Patient
TSH	4±1.6	3±0.62*
T3	1.4±0.70	3.20±0.86*
T4	93±30	108.5± 19.7*

*= Significant p <.05

Table (2) concentration lipid profile in the hyperthyroidism and the control group

Lipid profile	Control	Patient
Cholesterol mg/dl	212.1±23.2	155.5±24.6 *
Triglycerides mg/dl	111.6±10	73±8 *
HDL-C mg/dl	44.6±19.7	30.6±21.5 *
LDL-C mg/dl	109.1±13	145±25 *

*= Significant p <.05

CONCLUSION

in patients who have thyrotoxicosis which seems more likely to develop hyperthyroid, Hyperthyroid is associated with reduce levels of blood lipid ,HDL-C,LDL-C .

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