Cell. Mol. Biomed. Rep. (ISSN: 2823-2550)
https://doi.org/10.55705/cmbr.2022.365507.1072
2023, 3(1): 29-34

Short communication

Study of thyroid hormones effect on biochemical parameters of liver function in Iraqi patients

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Article info
Received: 13 Apr 2022
Revised: 14 Jul 2022
Accepted: 20 Oct 2022

Use your device to scan and read the article online

Keywords:
Thyroid, TSH, FBS, Liver, GPT

ABSTRACT

This study was aimed to study the effect of thyroid hormones on some biochemical tests of liver function in Iraqi male patients and to study the relationship between them. A controlled study included 135 samples from patients and controls, group B, 45 patients with a liver disorder, and group C: 45 patients with a thyroid disorder, and group A: 45 healthy people (as the controls group). The study concluded that there were significant statistically significant differences for patients with liver disease, as well as for patients who suffer from abnormalities in the functions of the thyroid gland. For triiodothyronine (T3) and thyroxine (T4), there was clear importance and a slight impact for patients with liver disease. Because of the defect in the liver enzymes, this led to an increase in the TSB percentage, which increased significantly. Alkaline and Albumin levels indicate statistical significance within the results of our study. Serum protein levels had no significant changes in our study.

1. Introduction

The thyroid gland, which is located in the lower front of the neck, is a butterfly-shaped endocrine gland that is responsible for regulating the body's metabolism. Thyroxine is the primary active hormone, while triiodothyronine is the secondary active hormone. Thyroxine is a hormone that aids in the production of energy in the body. Furthermore, both hormones have been shown to greatly increase the metabolic rate of the body. Among the organs of the endocrine system in this bodily system, the thyroid gland is the most important. Normal mature human thyroid hormones are classified as catabolic hormones because they are involved in an essential activity such as the regulation of numerous metabolic processes continuously in the normal mature human body [1, 2].

Thyroid hormones are classified as catabolic hormones because they are involved in an essential activity such as the regulation of numerous metabolic processes continuously in the normal mature human body [3]. Women all over the globe are affected by hyperthyroidism, a condition that affects around one percent of the population. In healthy adult males, this fraction is lower than it is in healthy adult females. This indicates that the thyroid gland is not releasing adequate hormones, as seen by the inability of the thyroid gland to function normally [4]

The diagnosis and treatment of these hormone imbalances are uncomplicated and well-controlled in the vast majority of patients; nevertheless, in severe cases, there is a danger of mortality if the disease is not handled immediately. When determining whether someone has hypothyroidism, the statistical reference ranges for crucial biochemical measurements are considered [5, 6]. Based on this reseans, This study was aimed to study the effect of thyroid hormones on some biochemical tests of liver function in

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Iraqi male patients and to study the relationship between them.

2. Material and methods

2.1. Blood samples

Blood samples were collected and determine the biochemical measurements for liver function tests are shown in the below sections, in addition, thyroid function tests such (TSH, T3, and T4) were determined.

2.2. T3 and T4 test

300 µL of the diluent has been withdrawn and then discarded into a granule detection buffer. Wait until the granules are completely diluted. 75 µL of the sample has been discarded into the detection buffer. Be mixed by shaking 10 times. Then the mixture (samples) is incubated for 8 minutes at room temperature. After the incubation period, 75 µL of the sample mixture is loaded onto the cartridge. The occurrence of lateral flow on the membrane should be checked. The cartridge is inserted into the chamber for an 8 Island [7].

2.3. Reagent composition

R1a: GOT substrate; Phosphate buffer 100 mmol / L pH 7.4 mixed with 200 m mol / L of L- aspartate and 2 mmol / L of Ketoglutarate; R1b: GPT substrate, Phosphate buffer 150 mmol / L Ph 7.4 mix with 200 mmol / L of L-alanine,and2mmol / L of Ketoglutarate; R2 DNPH, 2, 4-dinitrophenylhydrazine 1 mmol / L, Color developer CR. 34135; R3 4N NaOH, Mix 4 mmol 7 L of Sodium hydroxide with 1.8 m mol / L of Pyruvic standard [8].

2.4. Fast blood sugar (FBS) test

The test that determines the amount of sugar in blood samples is the fast blood sugar assay, this test detects the quantity of glucose in samples, and the blood sugar chart provides descriptions of blood sugar values in terms of mg/dL [9].

2.5. Materials

To arrive and to complete the purpose of the current investigation; the influence of thyroid hormones on a variety of biochemical tests of liver function in Iraqi male patients, as well as the link between the two variables, it has been selected about 135 people, A controlled study with 135 blood samples from patients and healthy were included, for more details, Figure1 shows the groups and number of a person through the current investigation. TSH, T4, T3, FBS, and other biochemical assays have been performed on the samples (Figure 1).

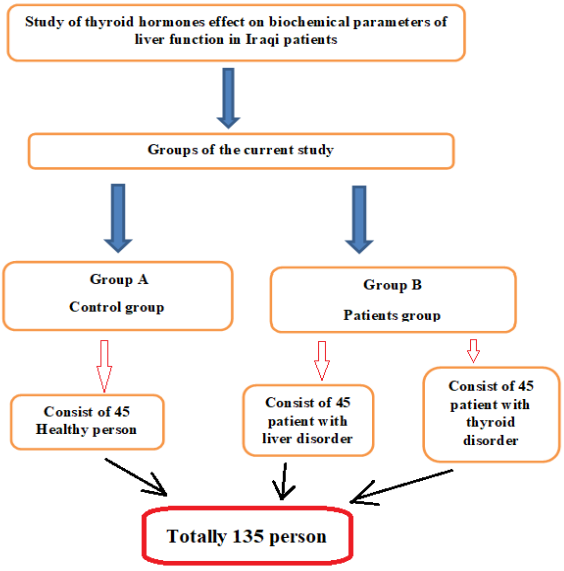

Fig. 1. Groups of the current study include a control group (group A) in addition to a patient's group (group B)

2.6. Selection of patients

The experimental studies planned to be carried out within the scope of this study were carried out in Iraqi hospitals.

2.7. Study population

In this recıch study, 135 samples were studied to investigate the effects of thyroid hormones on liver function in Iraqi patients.

2.8. Fast blood sugar (FBS) test

The test that determines the amount of sugar in blood samples is the fast blood sugar assay, this test detects the quantity of glucose in samples, the blood sugar chart provides descriptions of blood sugar values in terms of mg/dL.

2.9. Measurement of albumin

2.9.1. Colorimetric examination method

At pH 4.2, albumin exhibits sufficient cationic character to bind with bromocresol green

(BCG), an anionic dye, to form a blue-green compound, this kind of reaction is illustrated in Equation 1.

Equation 1

Albumin + BCG ⇨ Albumin-BCG Complex

The intensity of the blue-green color resulting from the reaction is directly proportional to the concentration of albumin.

2.10. Material required

Photometer for measurements at 505 nm, thermostatic water bath set at 37 C. Stop watch.Pipettes of 5 mL, 1mL,and 0.1 mL. Glass tubes. Table 1, it has been illustrated GOT and GPT with some other information.

Table 1. The subtraction of GOT and GPT

Tubes	Blank	GOT	GPT
GOT substrate	0.5 mL	0.5 mL	-
GPT substrate	-	-	0.5 mL

It has been warmed to 37ºC in the bath for 5 minutes, and then, the serum was added to about 100 µL of GOT and 100 µL of GPT and mixed. Return to bath at 37 C for 60 minutes. For DNPH add 0.5 ml of blank and 0.5 mL of GOT and 0.5 mL of GPT and mix. Stand for 20 minutes at room temperature. For NaOH 0.4 N add 5 mL of blank and 5 mL of GOT and 5 mL of GPT. Invert to mix and stand for 5 minutes at room temperature. Read the absorbance (A) of the samples against a water blank. The color is stable for at least 1 hour from absorbance, read units of GOT or GPT from the corresponding curve.

3. Results

3.1. The Results for the Selected Parameters

To study the relationship between people with liver disease and thyroid disorders and compare the results with healthy people. The study included 135 samples that included patients and controls (healthy people), age, TSH, T4, T3 FBS and some biochemical tests were studied, the results of the selected parameters are shown in Table 2. The study was divided into three groups: Group A 45 patients with a liver disorder. Group B: 45 patients with a thyroid disorder. Group C: 45 healthy people (control group).

3.2. Triiodothyronine (T3)

As shown in figure 2 the mean and standard deviation of T3 for the studied groups were shown a significant difference (149.5565 ± 33.88107) and (78.1589 ± 33.05649) when compared with control (116.8628 ± 22.49171).

3.3. Triiodothyronine (T4)

The mean and standard deviation of T4 for the studied groups were shown a non-significant difference (8.2414 ± 2.18218) and (5.6538 ± 3.48598) when compared with control (7.1691 ± 1.91208), at P = 0.001 as a shown in figure 2.

3.4. Thyroid-Stimulating Hormone TSH

The mean and standard deviation of TSH levels for the studied groups were shown a highly significant difference (3.1460 ± 1.35476) and (5.3648 ± 1.69192) when compared with control (2.0695 ± 1.23963), at P = 0.000 as a shown in figure 2.

Weak positive correlation was noticed between TSH with age and alkaline phosphate, and negative correlation was noticed between TSH with T3 and T4, the other parameters tests was a non-correlation with TSH, as show clearly in Table 2.

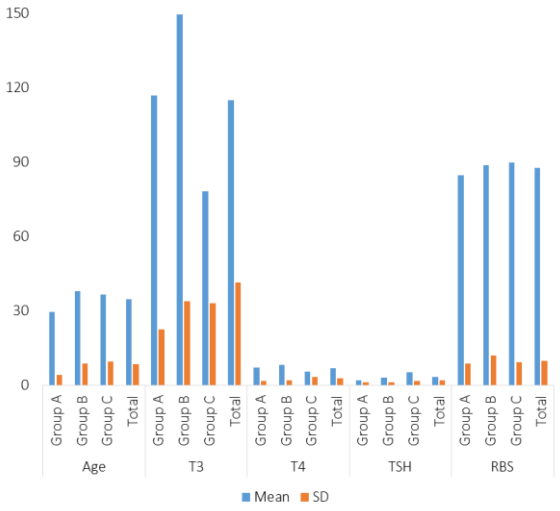

Fig. 2. The mean and standard deviation of TSH levels

Table 2. Correlation between TSH level and studied parameters in infertile men groups

Variable 1	Variable 2	Correlation	Count	P Value
TSH	Age	0.397*	135	0.030
	T3	-0.471**	135	0.009
	T4	-0.534**	135	0.003
	RBS	0.095	135	0.617
	GOT	-0.155	135	0.415
	GPT	-0.068	135	0.719
	Alkaline P.	0.396*	135	0.030
	TSB	-0.144	135	0.447
	Protein	-0.016	135	0.932
	Albumin	0.319	135	0.086

3.5. Random Blood Sugar (RBS)

The mean and standard deviation of RBS studied groups were a non-significant difference (88.7 ± 12.02821) and (89.9 ± 9.21894) compared with control (84.6 ± 8.77116), at P = 479 as shown in figure 2.

4. Discussion

The age effect on patients with liver disease, treatment of older patients with liver disease may require different or longer interventions. Transplantation of an older liver will be less tolerant of subsequent injury. Future studies are needed to understand more about the molecular mechanism of aging and contribute to the development of a noble treatment strategy that can block the progression of aging-induced liver diseases [10, 11]. This study is agreed with our study.

Several studies referring to those over 65 years show that thyroid illness is very much a disease of the elderly and that it often goes undiagnosed. Although the incidence of thyroid problems increases with age, it is sometimes difficult to diagnose as symptoms are not always as widespread or obvious as those in younger patients. While some of the symptoms of hyperthyroidism and hypothyroidism in older patients are like those in younger patients, symptoms of both disorders often manifest in subtle ways in older patients, masquerading as diseases of the bowel or heart or a disorder of the nervous system [12-15]. This is the same information that our study found in that the problems of thyroid disorders increase with age.

There are clinical and laboratory associations between thyroid and liver disease. Patients with chronic liver disease may have thyroiditis, hyperthyroidism, or hypothyroidism. Occasionally, alcoholics with active cirrhosis will show eye signs or laboratory evidence of hyperthyroidism, and yet be euthyroid on further testing. Patients with subacute thyroiditis or hyperthyroidism may have abnormalities in liver function tests which return to normal as the thyroid condition improves. In a similar fashion, patients with acute or chronic liver disease may have changes in thyroid function tests which improve as the liver inflammation resolves. These interrelationships must be remembered if errors in patient care are to be avoided [16-18]. This study is agreed with our study.

5. Conclusion

The study focused on liver disease and thyroid disorder, and the mean age of the studied groups showed a significant difference when compared with the control group at P = 0.059. The study showed that with advancing age, liver disease problems increased with thyroid disorders. The study concluded that there were significant statistically significant differences for patients with liver disease, as well as for patients who suffer from abnormalities in the functions of the thyroid gland. For T3 and T4, there was clear importance and a slight impact for patients with liver disease. Because of the defect in the liver enzymes, this led to an increase in the TSB percentage, which increased significantly. Alkaline Phosphatase and Albumin levels indicate statistical significance within the results of our study. Serum protein levels had no significant changes in our study.

Conflict of Interests

All authors declare no conflict of interest.

Ethics approval and consent to participate

No human or animals were used in the present research.

Consent for publications

All authors read and approved the final manuscript for publication.

Availability of data and material

All the data are embedded in the manuscript.

Authors' contributions

All authors had equal role in study design, work, statistical analysis and manuscript writing.

Informed Consent

The authors declare not used any patients in this research.

Funding/Support

This study was supported by Cankiri Karatekin University, Turkey.

Acknowledgement

This article was achieved based on the material and equipment of Cankiri Karatekin University, that the authors thanks it

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How to Cite This Article:

Kadhim Jaafer H, Kamac MB, Al-Gebori AM (2023) Study of thyroid hormones effect on biochemical parameters of liver function in Iraqi patients. Cellular, Molecular and Biomedical Reports 3 (1): 29-34. doi:10.55705/cmbr.2022.365507.1072

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