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Original article:

Study on thyroid function test in health and diseases

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Abstract:

Introduction: Hypothyroidism and hyperthyroidism are two prevalent functional thyroid disorders that are frequently treated by primary care doctors. In addition to those who have been diagnosed, many individuals see their doctor to have their thyroid status evaluated. This is done to rule out other possible causes of their symptoms, such as obesity, mood swings, hair loss, and exhaustion. There is an expanding corpus of research in the public domain, both in print and online, that contends doctors underdiagnose thyroid problems and that conventional thyroid function tests are unreliable.

Materials and methods: The Present study was carried out in the Dept, of Biochemistry Fathima Institute of Medical Sciences, Kadapa, A.P. India, and in the Department of Biochemistry in Collaboration with Dept, of Medicine during the period April-May 2016.The present study was carried out on 100 subjects. Out of these 100 subjects,50 subjects were patients with thyroid disorders which included Hyperthyroidism (25),Hypothyroidism (25) patients attending OPD of ENT, Medicine Dept, and who were taking regular treatment.

Results: The age ranged from 15 to 65 years. Diagnosis was done after clinical and laboratory examinations by the department of Biochemistry and Medicine. TFT interpretation is typically simple, but it's important to be aware of frequent hazards to prevent incorrect interpretation and poor case management. For instance, when thyroid hormone is resistant, just focusing on elevated TSH may result in the prescription of thyroxin, while patients receiving radioiodine treatment who have low TSH and T4 should avoid using thyroxine. It is wise to interpret TFT in connection to patients' clinical conditions rather than just focusing on the lab results.

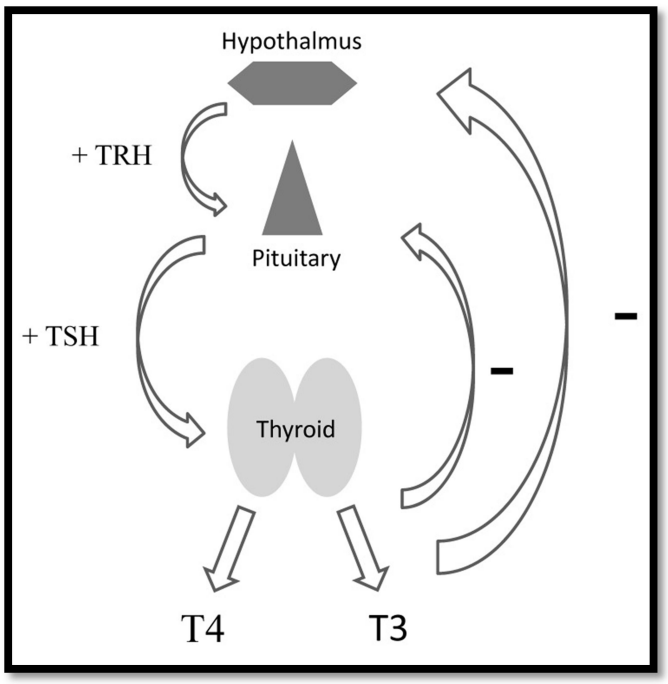
Key words: T3,T4,TSH. Hypothyroidism, Hyperthyroidism.

Introduction:

Hypothyroidism and hyperthyroidism are two prevalent functional thyroid disorders that are frequently treated by primary care doctors. In addition to those who have been diagnosed, many individuals see their doctor to have their thyroid status evaluated. This is done to rule out other possible causes of their symptoms, such as obesity, mood swings, hair loss, and exhaustion. There is an expanding corpus of research in the public domain, both in print and online, that contends doctors underdiagnose thyroid problems and that conventional thyroid function tests are unreliable.[1] Often, primary care physicians are the ones who first assess these patients and request biochemical tests. With many patients seeking and even demanding particular biochemical tests that might not be necessary, this process has grown increasingly complicated. [2]Thyroid stimulating hormone (TSH), free thyroxine (free T4), and

anti-thyroid peroxidase antibodies (anti-TPO ABs) are three significant biochemical tests of thyroid health that the primary care practitioner should be comfortable prescribing, interpreting, and in many cases, choosing not to do. The indications, utility, and potential drawbacks of these tests will be discussed in relation to the scrutiny that an increasing number of patients have placed on their correctness and validity.[3-5]

Figure 01 : Hypothalamic-pituitary-thyroid axis (TRH: Thyrotropin releasing hormone, TSH: Thyroid stimulating hormone, T3: tri-iodothyronine and T4: thyroxine).



Understanding thyroid physiology is necessary for accurate interpretation of thyroid function testing. The hypothalamus, pituitary, and thyroid gland themselves interact in a rather simple way to control thyroid function.

Iodine deficiency is a primary cause of hypothyroidism in indigenous people of all ages. The issue is made worse by high levels of goitrogenic chemicals like thiocyanates or phenolics in food and water.[5] These two substances are well known for their antithyroid properties. Iodine is a necessary ingredient in the creation of thyroid hormones. Iodine needs to be consumed in amounts of at least 50 mg per day.[4] The thyroid's autoregulatory system acts as the body's first line of defence against variations in iodine supply and also allows escape from the inhibitions of hormone synthesis that an excessive amount of iodine causes. Patients with depression or psychiatric conditions appear to have a higher prevalence[6-7]. The incidence increases dramatically after the age of 60 and could reach

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6.7%. The illness may be as prevalent in females as diabetes mellitus.

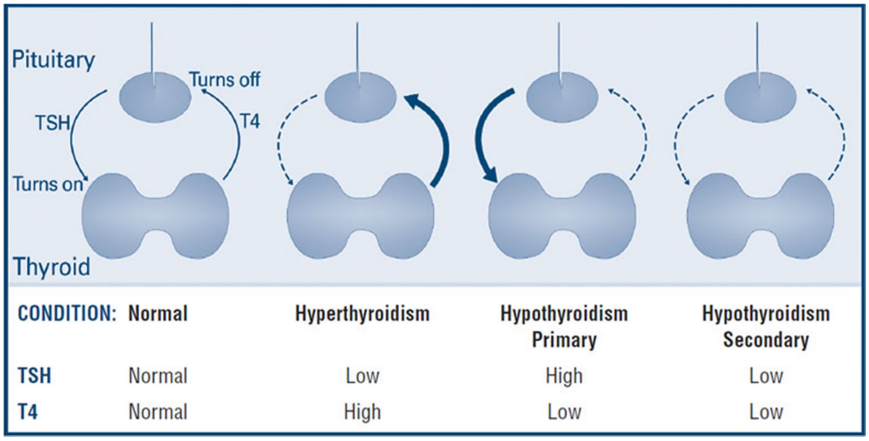

Figure 02: the thyroid and the pituitary, like a heater and thermostat, turn on and off. This is illustrated in the figure above.

The goal of the current study was to evaluate and analyse the data that had been collected and to review the data that had been published in the literature in order to come to our own conclusions. The study aspires to positively advance our understanding of thyroid function and diseases[8-9].

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50 subjects were selected with healthy growth and with no previous family history of thyroid diseases or disturbances e.g. Cretinism, Myxoedema, Grave's disease thyrotoxicosis etc. as controls. The age ranged from 15 to 65 years. 10 ml of fasting whole blood was collected in plain and sugar bulbs aseptically and investigations were carried out on serum in both cases.

Results:

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Table 1: Distribution of patients according to Sex.

S.NO	TYPE	MALE	FEMALE	TOTAL
01	HYPOTHYROIDISM	10	15	25
02	HYPERTHYROIDISM	11	14	25
03	HEALTHY ONE	25	25	50

The distribution of patient and controls according to sex is given in the table l. It can be seen from the table 1 that the hyperthyroidism patients were 25 (50.12%), and hypothyroidism patients were 25 (50.01%). In the present study total number of 50 controls subjects were included. They consisting of 25 males and 25 females.

Table 2:Thyroid profile in subjects.

S.NO	TYPE	NO	SEX	T3	T4	TSH
01	CONTROLS	25	MALE	1.25±0.22	6.4±2.2	1.7 ±1.9
		25	FEMALES	1.25±0.48	5.7 ± 2.4	2.8 ±3.8
02	HYPOTHYROIDISM	10	MALE	0.6 ± 0.56	2.7 ± 1.9	67.5 ±35.1
		15	FEMALES	0.51 ± 1.52	5.8 ±1.1	48.7±37.4
03	HYPERTHYROIDISM	11	MALE	3.6±2.6	17.2 ±5.3	0.68±39.6
		14	FEMALES	4.3±2.8	21.3 ±22.6	1.3±2.3

Table 2 shows serum T3, T4, and TSH of normal controls with no thyroid disease (Euthyroid) as compared to patients with hypothyroidism and hyperthyroidism. In controls T3 level was in the normal range in both sexes but slightly higher levels of T3 was found in females than males. The mean value of T3 and T4 in euthyroids was 1.25 ± 0.22 in male and 1.25 ± 0.48 in female as compared to hypothyroidism and hyperthyroidism was lower and higher respectively. It is well known facts.

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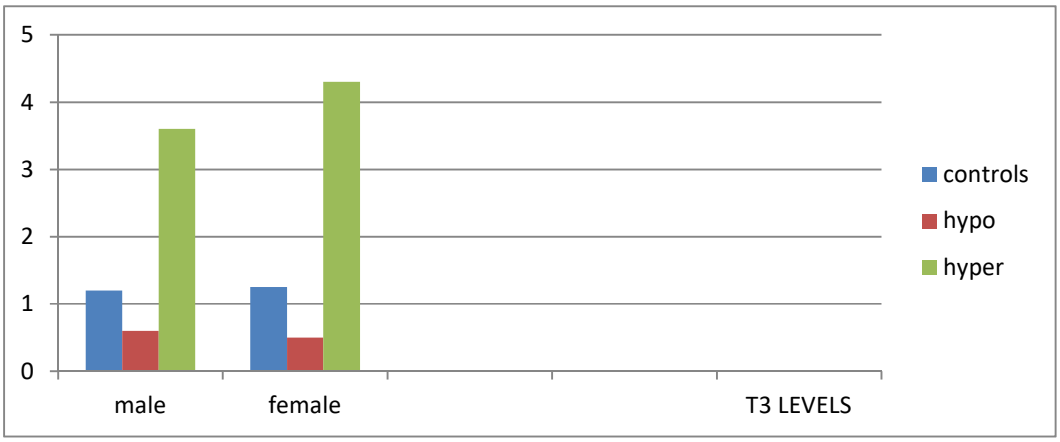

Figure 03: Shows T3 levels in controls, hypo and hyperthyroidism.

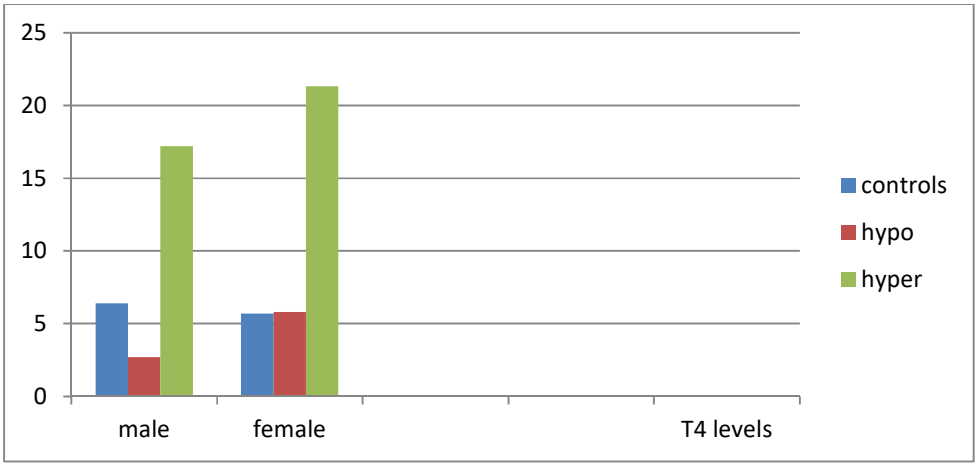

Figure 04 : Shows T4 levels in controls, hypo and hyperthyroidism.

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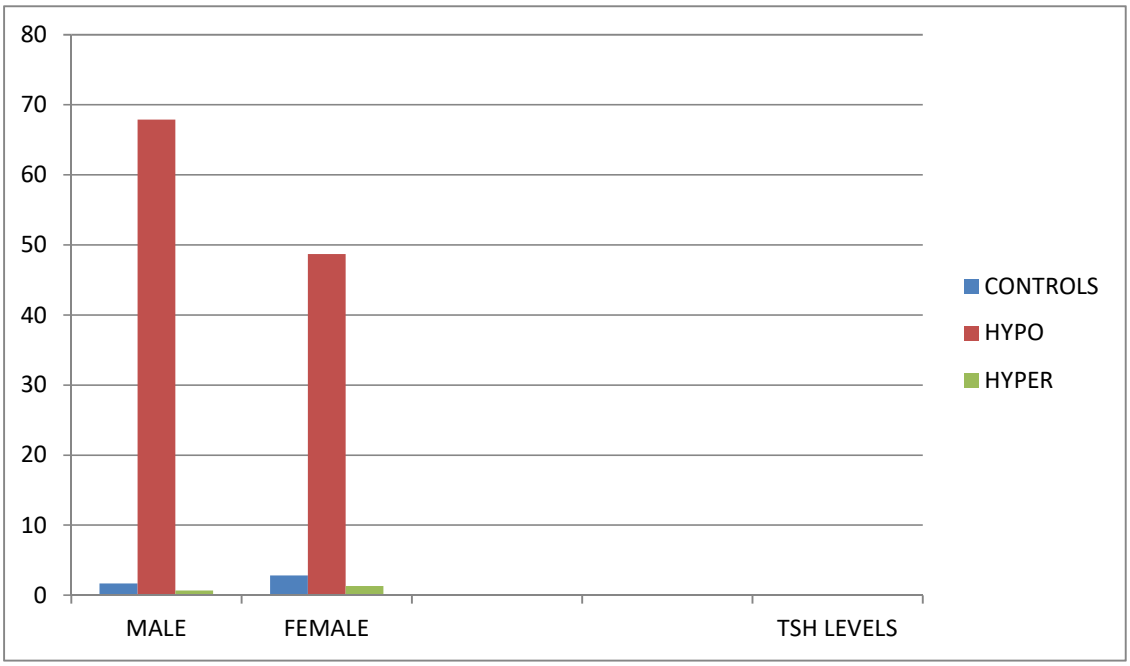

Figure 05: Shows TSH levels in controls, hypo and hyperthyroidism.

Discussion:

Thyroid disease is common (approximately 1% of the female population) [10].It presents with wide-ranging and often nonspecific symptoms - so needs to be considered in many differentials and, once diagnosed, needs to be regularly monitored to optimise therapy. Thyroid function tests (TFTs) are amongst the most commonly requested laboratory investigations in both primary and secondary care. In primary care, the most common use of a TFT is as part of a screen for nonspecific fatigue or illness. The value of such tests without a goitre or other clinical features has been challenged and some advocate the use of watchful waiting with the delayed use of laboratory tests (at four weeks post-presentation) as a more appropriate strategy for investigating unexplained fatigue[11].

In the present study table 01 shows The distribution of patient and controls according to sex is given in the table l. It can be seen from the table 1 that the hyperthyroidism patients were 25 (50.12%), and hypothyroidism patients were 25 (50.01%). In the present study total number of 50 controls subjects were included. They consisting of 25 males and 25 females. Table 2 shows serum T3, T4, and TSH of normal controls with no thyroid disease (Euthyroid) as compared to patients with hypothyroidism and hyperthyroidism. In controls T3 level was in the normal range in both sexes but slightly higher levels of T3 was found in females than males. The mean value of T3 and T4 in euthyroids was 1.25 ± 0.22 in male and 1.25 ± 0.48 in female as compared to hypothyroidism and hyperthyroidism was lower and higher respectively. It is well known facts.

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Conclusion:

TFT interpretation is typically simple, but it's important to be aware of frequent hazards to prevent incorrect interpretation and poor case management. For instance, when thyroid hormone is resistant, just focusing on elevated TSH may result in the prescription of thyroxin, while patients receiving radioiodine treatment who have low TSH and T4 should avoid using thyroxine. It is wise to interpret TFT in connection to patients' clinical conditions rather than just focusing on the lab results.

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