

Prevalence Of Thyroid Hormones Test Abnormality In Females At Reproductive Age Attending Al-batool Maternity Teaching Hospital

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Abstract

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Background: Although there is little information about the prevalence of thyroid disorders in young women, but they are common in Iraq.

Objective: To prevalence of thyroid hormones test abnormality in females at reproductive age attending al-batool maternity teaching hospital

Patients and Methods: This study involved 1570 of reproductive female ages patients at the Al-batool Maternity Hospital in Diyala Province, Iraq. Serum levels of T3, T4, and TSH were measured in this study. According to the conventional definitions of T3, T4, and TSH levels of overt hyper- and hypothyroidism patients were grouped according to their thyroid status at the time of testing.

Results: A total of 1570 subjects were screened of whom 152 subjects (18.6%) had abnormal TSH. The overall prevalence of hyperthyroidism with elevated TSH was 17.4%, of which 1.2% had hypothyroidism with elevated TSH. A low TSH was seen in 1.3% of the study population (P= 0.001). Generally, thyroxin hormone (T4) abnormalities were totaled at 12.02%, of which 10.22% were hypothyroidism and 1.8% was hyperthyroidism. Furthermore, the triiodothyroxin hormone T4 abnormality percentage was 14.84%, compared to hypothyroidism of 3.12% and hyperthyroidism of 11.72%.

Conclusion: Thyroid dysfunction was common in young women. Therefore, females more susceptible to thyroid disorders.

Keywords: prevalence, thyroid-stimulating hormone, hyperthyroidism, hypothyroidism, Iraq, women

Introduction

The prevalence of thyroid conditions in Iraq is now well known. In the past, iodine deficiency disorders have received attention of Iraqi Government. Since Iraq's introduction of a program of the universal

iodization of salt, it is already more than 40 years have passed [1].

Thyroid hormones are crucial for many metabolic processes, energy homeostasis, and the control of many organ functions [2]. Thyroid hormones; triiodothyronine (T3),

and thyroxine (T4) are synthesized according to thyrotrophin (TSH) stimulation secreted from the anterior pituitary gland. Subclinical thyroid disease, either subclinical hyperthyroidism or hypothyroidism, is characterized by the presence of normal thyroid hormones (T3, T4) combined with a change in the TSH hormone without outward signs or symptoms [2].

In most cases, elevated or depressed TSH is linked to vague, non-serious symptoms [3]. However, some research has indicated that patients with abnormal bone turnover are more likely to develop polycystic ovarian syndrome, cognitive impairment, cardiovascular disease, bone turnover, and some metabolic syndrome [4]. The main risk factors that may be connected to subclinical thyroid diseases as well as the development of overt thyroid disease include baseline TSH level, advanced age (over 60 years), female sex, and the presence of thyroid autoantibodies [5,6,7].

Even the management of conditions that are subclinical is debatable. Treatment for subclinical hypothyroidism is typically considered in patients with special circumstances only, such as those who are pregnant, infertile, or who have a high risk of developing overt hypothyroidism [8]. Treatment for subclinical hyperthyroidism is typically considered when the patient is elderly, when there is a high risk of osteoporosis, cardiovascular disease, or the condition could progress to overt hyperthyroidism [5,9].

Numerous studies have found a high prevalence of subclinical thyroid diseases in various populations, with >50% of subclinical thyroid diseases eventually

progressing to overt thyroid diseases over the course of 20 years. In order to lessen the clinical impact of these conditions that are anticipated in the future, screening and follow-up on the subclinical conditions of thyroid problems and prediction of progression to overt thyroid diseases are crucial.

This study sought to determine the prevalence of thyroid dysfunction (both overt and subclinical) in the Diyala population and to determine whether age-related factors might be associated with both incidence and progression.

Patients and Methods

Before starting the study, scientific research ethics approvals were obtained to deal with the patients participating in the study from the College of Medicine, University of Diyala, and Diyala Health Department/Al-Batool maternity Teaching Hospital for the purpose of collecting samples.

The study was based on visits by females of childbearing age to Al-Batool Hospital, where 1570 female volunteers between the ages of 20 and 40 years participated. Sample collection was restricted to women who were asked by the doctor to perform T3, T4, and TSH tests.

Furthermore, the study lasted from January 2021 to April 2022. A questionnaire was made for the reviewers who subjected to study, and they were asked about their age, address, and marital status.

Those who were suffering from chronic diseases such as diabetes, high blood pressure, heart disease, asthma, and kidney failure were excluded. Furthermore, thyroid patients were excluded.

Blood 5 ml was collected from each patient, the serum was separated, and tests were performed to measure the levels of T3, T4, and TSH in the postgraduate laboratories, the college of medicine, and the university of Diyala. The Cobas E411 device was used with a thyroid test kit of Roche or German origin.

Statistical Analysis

Utilizing the Chi-square (X²) test, data from the current study were analyzed to compare percentages. A significance threshold of 0.05 was used for the test. *

Indicates a significant difference (p<0.05), ** indicates a high significant difference (p<0.01), and *** indicates a very significant difference (p<0.001) in the analysis of current data using (SPSS v.22 and Excel 2013) programs.

Results

As shown in the Table (1), all 1570 participants were between the ages of 20 and 40, and their ages were distributed as follows: 20-29 were 46.0%, 30-39 were 38.8%, and 40 were 15.2%.

Table (1): participant ages group distribution

	Variables	NO.	Percent	Statistics
Age (years)	20-29	724	46.0%	X ² =245.602 Df= 2 P=0.001***
	30-39	608	38.8%	
	≥40	238	15.2%	

Among the 1570 subjects, significant abnormal serum levels TSH was seen in 292 subjects, and the overall prevalence of abnormal TSH was 18.6%. distributed as follows: 1.2% were hypothyroidism and 17.4% were hyperthyroidism (P = 0.001). Furthermore, serum T3 levels were measured

in 1570 subjects; there were 233 (14.84%) abnormal T3 records, with 3.12% hypothyroidism and 11.72% hyperthyroidism (P = 0.001). In addition, the prevalence of abnormal T4 serum levels was 189 (12.02%), with hypothyroidism at 10.22% and hyperthyroidism at 1.8%. as in Table (2).

Table (2): Distribution hormones (TSH, T3 and T4) according to Hypothyroidism, Normal and Hyperthyroidism by using X² test

	Variables	NO.	Percent	Statistics
TSH	Hypothyroidism	19	1.2%	X ² = 2304.68 Df=2 P= 0.001***
	Normal	1278	81.4%	
	Hyperthyroidism	273	17.4%	
T3	Hypothyroidism	49	3.12%	X ² = 2391.90 Df=2 P=0.001***
	Normal	1337	85.16%	
	Hyperthyroidism	184	11.72%	
T4	Hypothyroidism	161	10.22%	X ² = 2760.195 Df=2 P=0.001***
	Normal	1381	87.98%	
	Hyperthyroidism	28	1.8%	

Discussion

The prevalence of thyroid disorders depends on various factors, such as age, sex, geographical factors, and iodine intake. Since Iraq has dealt with the iodine problem, therefore, we must focus on other factors. Another important thing is that the prevalence of thyroid disease in Iraq has not been clearly investigated. In this study, we focused on thyroid problems. In one of governorates of Iraq, which is Diyala. We chose to concentrate on women in early reproductive age group in the current research.

Our data results concerning the distribution of thyroid disease compatible with a previous study done in Baghdad province which done by Tahir et al., 2020 [4], euthyroid status accounts for a higher percentage of thyroid cases, indicating that the majority of patients with thyroid symptoms (goiter) had thyroid function tests that were within normal range (normal T3, T4, TSH).

The study focusing on thyroid abnormalities between genders, they found that abnormal thyroid in females significantly higher than in males [4,13], which is compatible with our study about the females where we revealed that the females suffering from hypo and hyperthyroid. Another study conducted in nearby Kurdistan found that females were four times more likely than males to develop hyperthyroidism [14]. Furthermore, the findings of studies in Pakistan and India concluded that females are the dominant gender in thyroid abnormalities [15,16].

Even in UAE, a researchers revealed that females are more likely to develop overt hypothyroidism [17].

It is known that Asian women had more domestic responsibilities than men, which may have contributed to the higher incidence of thyroid issues in women. Additionally, nutritional deficiencies that can result in conditions like goiter, anemia, and other disorders are more common in females [18].

In a study conducted on women who have high free T3 (FT3) and TSH levels, they suggested that females are more at risk of developing the metabolic syndrome than men [19].

Two studies from India and Malaysia found thyroid diseases was observed more in the patient's age (41–60 years).[20] While a study from Ethiopia revealed the majority of thyroid diseases occurred in the age (30–39 years) [20].

There were contradictory findings among the reported studies regarding the prevalence of thyroid diseases among various age groups. In the current study, the ages (20–29 years) significantly had the highest prevalence of thyroid abnormalities than the ages (30-39 years).

Conclusions

The majority of thyroid disorders affect adult females. It may refer to psychological reasons, environmental reasons as a result of environmental pollution, and the nature of food.

Recommendations

So, TSH levels and underlying comorbidities must be taken into consideration while making treatment recommendations.

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Ethical clearance: Ethical approval was obtained from the College of Medicine /

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Conflict of interest: Nil

References

- [1]Ebrahim SM, Muhammed NK. Consumption of iodized salt among households of Basra city, south Iraq. Eastern Mediterranean Health Journal. 2012 Sep 1;18(9).
- [2]McAninch EA, Bianco AC. Thyroid hormone signaling in energy homeostasis and energy metabolism. Ann N Y Acad Sci 2014;1311:77-87.
- [3]Bell RJ, Rivera-Woll L, Davison SL, Topliss DJ, Donath S, Davis SR. Well-being, health-related quality of life and cardiovascular disease risk profile in women with subclinical thyroid disease: A community-based study. Clin Endocrinol (Oxf) 2007;66:548-56
- [4]Tahir NT, Najim HD, Nsaif AS. Prevalence of overt and subclinical thyroid dysfunction among Iraqi population in Baghdad city. Iraqi Journal of Community Medicine. 2020 Jan 1;33(1):20.
- [5]Imaizumi M, Sera N, Ueki I, Horie I, Ando T, Usa T, et al. Risk for progression to overt hypothyroidism in an elderly Japanese population with subclinical hypothyroidism. Thyroid 2011;21:1177-82
- [6]Hollowell JG, Staehling NW, Flanders WD, Hannon WH, Gunter EW, Spencer CA, et al. Serum TSH, T(4), and thyroid antibodies in the United States population (1988 to 1994): National health and nutrition examination survey (NHANES III). J Clin Endocrinol Metab 2002;87:489-99.
- [7] 7. Canaris GJ, Manowitz NR, Mayor G, Ridgway EC. The Colorado thyroid disease prevalence study. Arch Intern Med 2000;160:526-34.
- [8]Surks MI, Ortiz E, Daniels GH, Sawin CT, Col NF, Cobin RH, et al. Subclinical thyroid disease: Scientific review and guidelines for diagnosis and management. JAMA 2004;291:228-38.
- [9]Calsolaro V, Niccolai F, Pasqualetti G, Calabrese AM, Polini A, Okoye C, et al. Overt and Subclinical hypothyroidism in the elderly: When to treat? Front Endocrinol (Lausanne) 2019;10:177.
- [10]Biondi B, Cooper DS. The clinical significance of subclinical thyroid dysfunction. Endocr Rev 2008;29:76-131.
- [11]Cooper DS, Biondi B. Subclinical thyroid disease. Lancet 2012;379:1142-54.
- [12]Biondi B. Natural history, diagnosis and management of subclinical thyroid dysfunction. Best Pract Res Clin Endocrinol Metab 2012;26:431-46.
- [13]Hassen AF, Ahmed SA. Assessment contributing factors related to hypothyroidism/hyperthyroidism for adult patient at Bagdad teaching hospitals. Kufa J Nurs Sci 2015;5:1-9.
- [14] Khan A, Khan MM, Akhtar S. Thyroid disorders, etiology and prevalence. Pak J Med Sci 2002;2:89-94.
- [15]Usha Menon V, Sundaram KR, Unnikrishnan AG, Jayakumar RV, Nair V, Kumar H. High prevalence of undetected thyroid disorders in an iodine sufficient adult south Indian population. J Indian Med Assoc 2009;107:72-7.
- [16] Pradeepkumar NS, Singh R, Joseph NM. Emerging trends in thyroid diseases in tsunami hit coastal areas of Puducherry and Cuddalore, India. J Evol Med Dent Sci 2012;1:857-63.

[17]Alameri M, Wafa W, Moriarty M, Lessan N, Barakat MT. Rate of progression of subclinical hypothyroidism to overt hypothyroidism: A 10-year retrospective study from UAE. *Endocrine Abstracts* 2018; 59:202.

[18]Khattak KN, Akhter S, Khan A, Siddiqui MM, Nawab G. Distribution of thyroid patients between age groups, sex and seasons in the thyroid patients referred to Irum Peshawar. *J Med Sci* 2001; 1:400-3.

[19]Meng Z, Liu M, Zhang Q, Liu L, Song K, Tan J, et al. Gender and age impacts on the association between thyroid function and metabolic syndrome in Chinese. *Medicine (Baltimore)* 2015;94:e2193.

[20]Htwe TT, Hamdi MM, Swethadri GK, Wong JO, Soe MM, Abdullah MS. Incidence of thyroid malignancy among goitrous thyroid lesion from Sarawak General Hospital 2000–2004. *Singapore Med J* 2009;50:724-8.

اختبار معدل انتشار شذوذ هرمونات الغدة الدرقية في الإناث اللاتي في سن الإنجاب الحاضرات إلى مستشفى البتول التعليمي للولادة

مصطفى عبد الكريم سلمان^١

الملخص

خلفية الدراسة: على الرغم من قلة المعلومات حول انتشار اضطرابات الغدة الدرقية لدى الشباب ، إلا أنها شائعة في العراق.

اهداف الدراسة: لاختبار معدل انتشار شذوذ هرمونات الغدة الدرقية في الإناث اللاتي في سن الإنجاب الحاضرات إلى مستشفى البتول التعليمي للولادة.

المرضى والطرائق: شملت هذه الدراسة ١٥٧٠ مريضة في سن الإنجاب في مستشفى البتول للولادة في محافظة ديالى ، العراق. تم قياس مستويات المصل من T3 و T4 و TSH في هذه الدراسة. وفقاً للقيم التقليدية لمستويات T3 و T4 و TSH لمرضى فرط نشاط الغدة الدرقية الصريح وقصور الغدة الدرقية ، تم تصنيفهم وفقاً لحالة الغدة الدرقية لديهم في وقت الاختبار.

النتائج: تم فحص ما مجموعه ١٥٧٠ شخصاً منهم ١٥٢ شخصاً (١٨,٦٪) لديهم هرمون TSH غير طبيعي. كان معدل انتشار فرط نشاط الغدة الدرقية مع ارتفاع هرمون TSH 17.4 ٪ ، منهم ١,٢ ٪ يعانون من قصور الغدة الدرقية مع ارتفاع هرمون TSH. لوحظ انخفاض TSH في ١,٣ ٪ من سكان الدراسة (P = 0.001). بشكل عام ، بلغ إجمالي شذوذ هرمون التيروكسين (T4) 12.02 ٪ ، منها ١٠,٢٢ ٪ قصور الغدة الدرقية و ١,٨ ٪ فرط نشاط الغدة الدرقية. علاوة على ذلك ، كانت نسبة شذوذ هرمون ثلاثي يودوثيروكسين T4 14.84 ٪ ، مقارنة بقصور الغدة الدرقية ٣,١٢ ٪ وفرط نشاط الغدة الدرقية ١١,٧٢ ٪.

الاستنتاجات: كان ضعف الغدة الدرقية شائعاً عند الشباب. لذلك ، فإن الإناث أكثر عرضة لاضطرابات الغدة الدرقية.

الكلمات المفتاحية: انتشار الهرمون المنشط للغدة الدرقية، فرط نشاط الغدة الدرقية، قصور الغدة الدرقية، العراق، النساء

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