RESEARCH
O&G Forum 2024; 34 – 3s: 2027-2035

CLINICAL STUDY OF HYPOTHYROIDISM IN HILLA CITY / IRAQ

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Abstract

Background : Hypothyroidism is a medical condition marked by inadequate secretion of vital hormones by the thyroid gland, which are crucial for optimal metabolic function in the body. Untreated hypothyroidism, especially when it is readily apparent, can result in substantial harm to multiple organ systems, both in the short-term and long-term.

Objectives: to study clinical profile of patients with hypothyroidism .

Patients and Methods: The study was conducted at the diabetes and endocrinology center in Murjan Hospital, which is located in Hilla City/ Iraq . It was a cross-sectional study. The study included a sample of 270 patients. Data was collected over five months by using a standardized questionnaire.

Results: The study shows that a higher proportion of hypothyroidism in females were 94.1%. with the highest percentage of 29.6% being aged 40–49, 75.6% of participants live in urban areas, 75.9% were unemployed, most participants 89.6were married, and 54.8% had family history. Poly menorrhea was a common menstrual disorder (48,6%), followed by amenorrhea (47.3%) . The most prevalent signs and symptoms among patients with hypothyroidism are tiredness, which affects 87.0% of individuals, and hair loss, which affects 71.9%. The incidence rates of slow movement, weight gain, dry skin, cold sensitivity, and constipation are 68.1%, 64.1%, 61.1%, 60.0%, and 49.3%, respectively. Diabetes mellitus is considered the most common comorbidity (25.9%), followed by hypertension 13.3%. 32.2% of BMI of hypothyroidism were obese .regarding to waist to hip ratio 54.8% were at risk .the prevalence poly ovary cystic syndrome in hypothyroidism female was 17.7% and prevalence erectile dysfunction in hypothyroid male was 87.5%.

Conclusion: Hypothyroidism is more common in females 94.1%, with poly menorrhea being the most frequent menstrual disturbances48.6%,and also concluded hypothyroidism correlated with obesity . its consider risk factor for erectile dysfunction in male and polycystic ovary syndrome in female.

Key word : hypothyroidism , menstrual disturbance , diabetes mellitus, Hilla city, adults

Introduction

The endocrine system includes the thyroid gland, which secretes hormones into the bloodstream. Human development and maturation rely on these hormones, which are often referred to as the "regulator of all human functions"[1]. Thyroid hormones include thyroxin (T4) and triodothyronine (T3). A chronic condition known as hypothyroidism develops when there are insufficient levels of these hormones [2]. Hypothyroidism is associated with factors of metabolic syndrome such as dyslipidemia, hypertension, obesity, and often insulin resistance[3]. Untreated hypothyroidism, particularly when it is easily noticeable, can cause significant damage to various organ systems, both in the immediate and long-lasting periods [4].

The majority of adults with hypothyroidism suffer from acquired hypothyroidism, which can arise either in the thyroid gland (primary hypothyroidism) or in the pituitary or hypothalamus (central hypothyroidism). [5]. Globally , the disorder is most prevalent in nations with a high prevalence of iodine insufficiency resulting from insufficient intake of iodine-rich foods. Accurately determining its prevalence is difficult due to the diversity in the underlying causes [6]. in the north region of Iraq, The prevalence of primary hypothyroidism was 1.20%[7] . Several potential causes of hypothyroidism include autoimmune thyroiditis[8], Insufficient intake of iodine through diet, previous

thyroid surgery or radiation exposure, the use of certain medications like lithium, and abnormalities in the pituitary and hypothalamus [9]. Hypothyroidism is linked to obesity and can have an effect on adolescence. It is associated with an earlier start of puberty and menarche, as well as hyper androgenism which can cause menstrual irregularities. Additionally, it can increase the risk of premenstrual disorders, dysmenorrhea, and heavy menstrual bleeding in adolescent girls and young adult women [10] . Multiple studies have confirmed the necessity of maintaining a state of equilibrium in leptin hormones in patients with hypothyroidism [11], as they play a crucial role in regulating body weight and also have an impact on the functioning of the reproductive system[12].

The symptoms of hypothyroidism are nonspecific and can be mistaken as indications of other medical conditions[13]. The measurement of thyroid-stimulating hormone (TSH) in the blood is the primary diagnostic test for assessing thyroid dysfunction[14]. The standard treatment for hypothyroidism entails the dispensation of levothyroxine, a synthetic variant of thyroid hormone[15].

Patients and method

A cross-sectional study was undertaken at a single center, specifically the endocrinology and diabetes center in Medical Murjan City, Babylon Governorate, Iraq. The study was conducted from March 2023 to August 2023, with a sample size of 270 participants diagnosed with hypothyroidism[16]. the data collection based on the structured questionnaire depended on inclusion and exclusion criteria by the interviewer, Patients aged 18 years and above were included .subclinical hypothyroidism and pregnant women were considered excluded.

Ethical considerations

The study obtained approval from the Babel Health Directorate, the Human Development and Training Centre's Unit of Research, and Murjan Hospital in Hilla City. Participants were required to provide informed permission.

Statistical analysis

The data was entered in the Microsoft Excel worksheet and analyzed using the IBM SPSS-29 statistical tool (IBM Statistical Packages for Social Sciences- version 29, Chicago, IL, USA) The data were presented using basic statistical measures such as frequency, percentage, mean, standard deviation, and range (minimum-maximum values).

Results

Table (1) The findings demonstrate that the majority of patients with hypothyroidism 29.6% fall in age group 40-49, females prevail the sample at 94.1%, 75.6% of participants live in urban, regarding occupation 75.9% of participants were unemployed, most participants89.6% were married ,54.8% had family history.

Table (1): Distribution of the Studied Sample by Socio-demographic characteristics.

Socio-Demographic characteristic		Hypothyroidism (n=270)	
		No	%
Age (years)	<20years	4	1.5
	20---29	29	10.7
	30---39	58	21.5
	40---49	80	29.6
	50---59	56	20.7
	60---69	36	13.3
	70years	7	2.6
	Mean±SD (Range)	44.6±12.6 (18-76)	
Sex	Males	16	5.9
	Females	254	94.1
Residence	Urban	204	75.6
	Rural	66	24.4
Occupation	Employed	65	24.1
	Unemployed	205	75.9
Marital status	Married	242	89.6
	Unmarried	28	10.4
Family history	Yes	148	54.8

	No	122	45.2

Table(2) represents that the distribution of participants with hypothyroidism according to anthropometric measurements. The results found that(0%) underweight,(9.6%) normal weight,(28.9%) overweight,(32.2%)obese,(29.3%) morbid obese. regarding to waist to hip ratio,(5.9%) had excellent,(10.0%)had good,(29.3%)had average,(54.8%) at risk. The mean weight and height were 82.2±13.6, 161.0±7.0 respectively. According to mean of waist was 99.89±13.64 and mean of hip ratio wa112.66±11.28.

Table (2): The distribution of participants with hypothyroidism according to anthropometric measures.

Anthropometric measurements		Hypothyroidism (n=270)	
		No	%
BMI (Kg/m2)	Underweight (<18.5)	-	-
	Normal (18.5-24.9)	26	9.6
	Overweight (25-29.9)	78	28.9
	Obese (30-34.9)	87	32.2
	Morbid obesity (=>35)	79	29.3
	BMI (Kg/m2)	31.7±5.1 (18.61-43.56)	
	Weight (Kg)	82.2±13.6 (43-117)	
	Height (cm)	161.0±7.0 (140-180)	
	Waist circumference (cm)	99.89±13.64 (58-129)	
	Hip circumference (cm)	112.66±11.28 (81-139)	
WHR	Excellent (<0.85M & <0.75F)	16	5.9
	Good (0.85-0.89M & 0.75-0.79F)	27	10.0
	Average (0.90-0.95M & 0.80-0.86F)	79	29.3
	At Risk (=>0.95M & =>0.86F)	148	54.8
	Mean±SD (Range)	0.888±0.095 (0.537-1.157)	

Table (3) The findings of this study suggest that the majority of patients with hypothyroidism
55.7% of women had normal cycle , while 44.3% had irregular cycle . poly menorrhea was reported by 48.6 amenorrhea by47.3%,and oligomenorrhea by 4.1%. about 32.5of patients entered menopause.

Table (3): The distribution of participants with hypothyroidism according to the menstrual history.

Menstrual history (females only)		Hypothyroidism (n=254)	
		No	%
Menstrual cycle	Regular	93	55.7
	Irregular	74	44.3
Menstrual disturbance	Amenorrhea	35	47.3
	Oligomenorrhea	3	4.1
	Poly menorrhea	36	48.6
Menopause state	Yes	89	35.0
	No	165	65.0

In table(4), this study found that about 40.4% of the participants got radioactive iodine therapy or surgery for hyperthyroidism. Surgery (92.7%) outnumbered iodine therapy (7.3%) among those treated. Erectile

dysfunction was reported by 87.5% of male participants. Polycystic ovarian syndrome (PCOS) was reported by 17.7% of women.

Table (4): The distribution of participants according to risk factor related to hypothyroidism .

Risk factor for hypothyroidism		Hypothyroidism (n=270)	
		No	%
1-Those who have had treatment with radioactive iodine therapy/surgery for hyperthyroidism	Yes	109	40.4
	No	161	59.6
2-Those who have had treatment with radioactive iodine therapy/surgery for hyperthyroidism	Surgery	101	92.7
	Iodine	8	7.3
3-Have you ever had erectile dysfunction (only for men) (n=16)	Yes	14	87.5
	No	2	12.5
4-Have you ever had polycystic ovary syndrome (only for women) (n=254)	Yes	45	17.7
	No	209	82.3

Table (5) represent that The results reported that 25.9% of patients with hypothyroidism have diabetes. while 13.3% of patients had hypertension. Furthermore, peptic ulcer 5.9%, rheumatoid arthritis 3.3%,asthma1.1%,chronic bronchitis1,5%,Myocardial Infraction0.4% solid tumors 0.7%.

Table (5): The distribution for participants with hypothyroidism according to comorbidities.

Charlson comorbidity index		NO	%
Myocardial infarction	Yes	1	0.4
	No	269	99.6
Diabetes	Yes	70	25.9
	No	200	74.1
Hypertension	Yes	36	13.3
	No	234	86.7
Peptic ulcer	Yes	16	5.9
	No	254	94.1
Rheumatoid Arthritis	Yes	9	3.3
	No	261	96.7
Sold tumour	YES	3	0.7
	No	261	96.7
Asthma	Yes	3	1.1
	No	267	98.9
Chronic bronchitis	Yes	4	1.5
	No	266	98.5

Figure (1) The findings of this study demonstrated that the higher of patients with hypothyroidism commonly encounter fatigue (87.0%), followed by fragile hair (71.9%), sluggish movements (68.1%), weight gain (64.1%), dry skin (61.1%), and intolerance to cold (60.0%), constipation (49.3%)

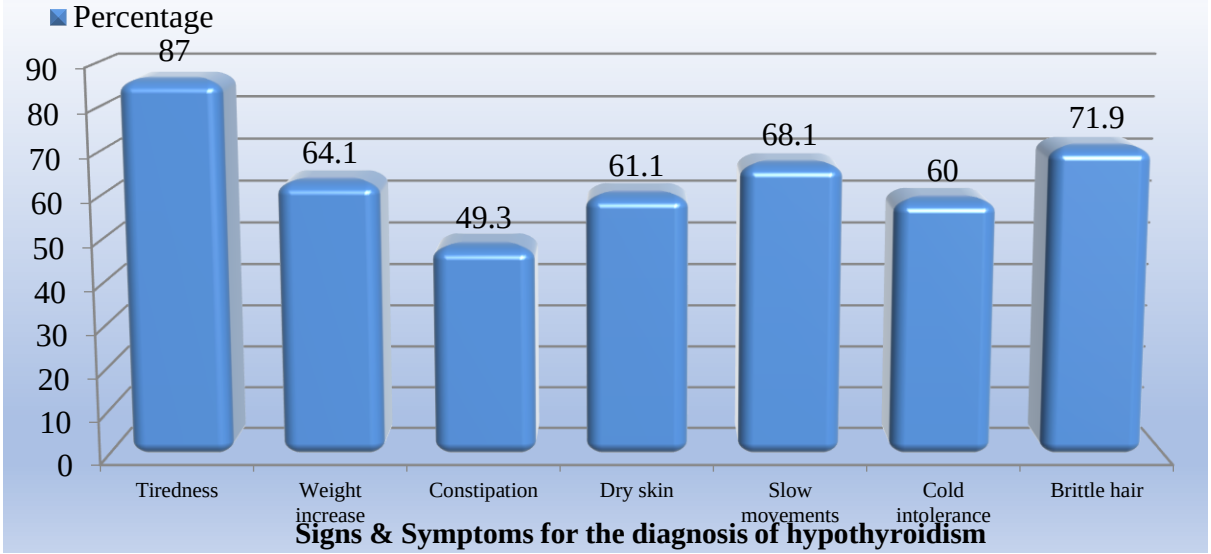

Figure (1) demonstrate the distribution of signs and symptoms with hypothyroidism patients.

Discussion

The current study indicates that the majority of patients with hypothyroidism were (29.6%) in the age group of (40-49) and (21.5%) in age group (30-39)with the mean of hypothyroidism was (44.6 ± 12.6SD) . this finding is accordance with other study , a study carried out in Saudi Arabia by [17] and another study in [18] they shows that the majority of patients with hypothyroidism(26.4%) (32%) respectively fall in aged (30-39). Furthermore, a study conducted in the United Kingdom found The TSH % exhibits a gradual increase with age in both males and females. as established by [19].Additionally, a study done by [20] in turkey that revealed the mean of hypothyroidism was (44.35 ± 13.37 SD).

According to sex, the majority of patients with hypothyroidism were females(94.1%),while only (5.9%) were males . this finding is agree with study done in Iraq[21] that reveled 83.6% of cases were female , while males constituted a minority at 16.36%. Another study conducted in USA done by [22] that reveals a higher percentage of hypothyroidism in females (81.9%)compared to males (18.1%). The increased prevalence of thyroid disorders in females can be attributed to several causes , such as stress associated with their lifestyle. Women, particularly those of Asian descent, often bear a greater burden of domestic responsibilities compared to men ,additionally Females also are more exposed to nutritional deficiencies that can cause health problems such as goiter, anemia, and other disorders [23]

Regarding to resident, the current study suggest that majority of patients with hypothyroidism was 75.6% live in urban area ,while 24.4%live in rural area . this finding is agree with a study conducted in India [24] who found a higher percentage of hypothyroidism in urban area (86.86%) compered to rural area (13.14%).

The study suggests a higher percentage of thyroid dysfunction among the unemployed(74.4%) compared to the employed (25.6%), which is consistent with a similar study conducted in Iraq [25] on hypothyroidism patient which found (66.7%) unemployed and (33.3%) employed . another study in north of Iraq showed that (70.4%) of patients diagnosed with thyroid dysfunction housewife while 20.0% were employed [26]. This could be brought on by financial issues and the jobless person's low personal .

According to marital status, a higher percentage (90.2%) of total thyroid dysfunction were married and only (9.8%) were non-married. This conclusion is analogous to a study conducted in Iraqi females, who revealed a higher percentage (90%) were married and (10%) non-married [27].

According to family history, the study revealed that a majority (54.8%) of patients had a familial background of thyroid dysfunction, while (47.4%) did not, this results are comparable with other studies , a study done in Saudi Arabia revealed that (40.7%) of respondent with thyroid dysfunction had family history[28] , another across- sectional study done by suggest that (43.9%) of participant had family history[28] furthermore ,a study in Nasiriya /Iraq stated that (43.75%) of thyroid dysfunction patients had family history[30].

The distribution signs and symptoms of hypothyroidism among 270 patients reveals that the most prevalent symptoms are tiredness, affecting 87.0% of the patients, and hair loss, affecting 71.9%. The prevalence of slow movement is 68.1%, weight increase is 64.1%, dry skin

is 61.1%, cold intolerance is 60.0%, and constipation is 49.3%. these finding quite similar with A study conducted by[31] that identified the most prevalent symptoms as dry skin (73.33%), hair loss (73.33%), and constipation (43.33%).

As per menstrual disturbance, the present study demonstrated a higher percentage(48.6%) poly menorrhea,(47.3%) of amenorrhea, and (4.1%) oligomenorrhea , this finding is consistence with other studies. a study done by [32]found the poly menorrhea in hypothyroid patients was (37.5%). Another across the sectional study, among 79 patients poly menorrhea was (29.11%),[33]. Another study in India of 100 women found (21.7%) amenorrhea[33]. Furthermore ,a study in japan found oligomenorrhea was 5.4% among 111 hypothyroid patients[35]. These differences may be due to differences in sample size between the present study and another studies .A study conducted in India [36] concluded that the hypothyroidism, a thyroid disorder, frequently contributes to menstrual disorders in women, impacting reproductive health, menarche, pubertal growth, cycles, fertility, postpartum period, reproductive years, and postmenopausal years.

Comorbidity refers to the coexistence of other medical problems alongside a specific primary ailment[37] **.** The results of current study reported that 25.9% of patients with hypothyroidism had diabetes. while 13.3% of patients had hypertension A study conducted by [38]likewise suggest that 29.83% of patients with hypothyroidism also had diabetes. A total of 246 patients were diagnosed with clinical hypothyroidism of which 20.5% were classified as diabetic[39]. Furthermore a study carried out in India that found patients with hypothyroidism found 15.8%hypertension and 18.7%had diabetes mellitus[40]. [41] reported 20% association of diabetes mellitus with the hypothyroid patients. There is a complex and important connection between DM and thyroid problems, Increasing evidence suggests a variety of intricate biochemical, genetic , and hormonal dysfunctions that are interconnected, indicating a pathophysiological relationship[42].

In present study 17.7% of females patients with hypothyroidism had polycystic ovary syndrome. this results is agree with a study done in Saudi Arabia showed that (21.8%) of female patients had polycystic ovary syndrome. Another study done in India by [43] revealed that 33% of patients with primary hypothyroidism had ovarian cyst. Another studies confirm that the women having ovarian cyst were at risk of development hypothyroidism[44][45]. Erectile dysfunction (ED) is a pervasive problem among men worldwide [46]**.**Thyroid gland abnormalities are one of the numerous risk factors for erectile dysfunction.in present study demonstrated that a higher proportion of males patients with erectile dysfunction was (87.5%). This finding is closely related with study done in 2019 showed that (63%) of males hypothyroid patients had erectile dysfunction [47].another study found Hypothyroid males also show altered sexual behavior. In adult hypothyroid males impaired sexual behavior including hypoactive sexual desire, erectile dysfunction and ejaculatory disorders are prevalent. In these hypothyroid patients the sexual behavior improved with restoration of thyroid status[48].

Conclusion:

Hypothyroidism is more common in females 94.1%, with poly menorrhea being the most frequent menstrual disturbances48.6%,and also concluded hypothyroidism correlated with obesity . its consider risk factor for erectile dysfunction in male and polycystic ovary syndrome in female.

Recommendation:

We recommended to investigate hypothyroidism for any menstrual disorder in non-pregnant women. Further research is warranted to explore various aspects of hypothyroidism , such as its prevalence, risk factors, quality of life, and economic burden in different populations and settings.

Acknowledgement

We express our profound gratitude to the diabetes center and endocrinology staff of Marginal Medical Hospital, as well as the patients, for their meticulous involvement in the completion of the documentation**.**

References

[1] K. L. Moore, T. V. N. Persaud, and M. G. Torchia, *The developing human-e-book: clinically oriented embryology*. Elsevier Health Sciences, 2018.

[2] R. Guglielmi *et al.*, “Shift from levothyroxine tablets to liquid formulation at breakfast improves quality of life of hypothyroid patients,” *Endocrine, Metab. Immune Disord. Targets (Formerly Curr. Drug Targets-Immune, Endocr. Metab. Disord.*, vol. 18, no. 3, pp. 235–240, 2018.

[3] H. Abid Al-Hussein Hassan, D. Salman Dawood, and R. Jawad Hussein, “Estimation of Apolipoprotein A1, Haptoglobin and Alpha 2macroglobulin with some Biochemical Metabolic Markers in Nonalcoholic Fatty Liver Disease Iraqi Patients,” *J. Tech.*, vol. 3, no. 1, pp. 24–30, 2021, [Online]. Available:

http://journal.mtu.edu.iq

[4] L. Mehran *et al.*, "Evaluation of the congenital hypothyroidism screening programme in Iran: a 3-year retrospective cohort study," *Arch. Dis. Childhood-Fetal Neonatal Ed.*, vol. 104, no. 2, pp. F176–F181, 2019.

[5] L. Chaker, S. Razvi, I. M. Bensenor, F. Azizi, E. N. Pearce, and R. P. Peeters, "Hypothyroidism," *Nat. Rev. Dis. Prim.*, vol. 8, no. 1, 2022, doi: 10.1038/s41572-022-00357-7.

[6] B. M. Heppel-holden, "Hypothyroidism : causes , diagnosis and treatment," no. August, pp. 1–14, 2023.

[7] B. A. Zaman *et al.*, "Prevalence of thyroid dysfunctions in a large, unselected population in Duhok city, Iraqi Kurdistan: A cross-sectional study," *J. Biol. Res.*, vol. 94, no. 2, pp. 107–115, 2021, doi: 10.4081/JBR.2021.10067.

[8] K. Nather, T. İ*, F. A. Risan, and A. J. Mohammed, "Possible Roles of Micro RNA-142-5p and Claudin-1 in Development of Hashimoto's Thyroiditis in Iraqi Patients," *J. Tech.*, vol. 4, no. 2, pp. 50–55, 2022, [Online]. Available: http://journal.mtu.edu.iq

[9] A. M. Alhawiti, A. S. Albalawi, and A. A. Alghamdi, "Assessment of Public Knowledge regarding the Differences between Hyperthyroidism and Hypothyroidism," *Egypt. J. Hosp. Med.*, vol. 70, no. 9, pp. 1595–1602, 2018, doi: 10.12816/0044689.

[10] K. Itriyeva, "The effects of obesity on the menstrual cycle.," *Curr. Probl. Pediatr. Adolesc. Health Care*, vol. 52, no. 8, p. 101241, Aug. 2022, doi: 10.1016/j.cppeds.2022.101241.

[11] D. G. Tomov *et al.*, "Serum Levels of Leptin and Adiponectin in Patients with Autoimmune Hashimoto's Thyroiditis," *Folia Med. (Plovdiv).*, vol. 65, no. 2, pp. 199–206, 2023, doi: 10.3897/folmed.65.e75390.

[12] A. J. Hasan, "Role of leptin and inhibin B in infertile males with metabolic syndrome," *J. Tech.*, vol. 2, no. 1, pp. 30–34, 2020, doi: 10.51173/jt.v2i1.109.

[13] D. Wojtachnio, A. Osiejewska, J. Bartoszewicz, and A. Grądzik, "Hypothyroidism : clinical presentation , diagnosis , treatment," vol. 12, no. 8, pp. 650–660, 2022.

[14] B. Pradhan and S. B. Pradhan, "Prevalence of thyroid dysfunction in community of Duwakot, Bhaktapur," *J. Pathol. Nepal*, vol. 7, no. 2, pp. 1184–1187, 2017.

[15] U. Gottwald-Hostalek and S. Razvi, "Getting the levothyroxine (LT4) dose right for adults with hypothyroidism: opportunities and challenges in the use of modern LT4 preparations," *Curr. Med. Res. Opin.*, vol. 38, no. 11, pp. 1865–1870, 2022.

[16] A. Alsarray and R. Shareef, "Awareness of Healthcare Providers About COVID-19 Vaccinations in Karbala City," *J. Tech.*, vol. 4, pp. 91–96, Nov. 2022, doi: 10.51173/jt.v4i33.654.

[17] A. S. Alzahrani *et al.*, "Diagnosis and Management of Hypothyroidism in Gulf Cooperation Council (GCC) Countries," *Adv. Ther.*, vol. 37, no. 7, pp. 3097–3111, 2020, doi: 10.1007/s12325-020-01382-2.

[18] S. Salih, W. Kamel, M. Abbas, S. Kasim, and K. S. Abass, "Prevalence of Hyperthyroidism and Hypothyroidism and its Correlation with Serum Antithyroglobulin among patients in Kirkuk-Iraq," *J. Adv. Pharm. Educ. Res.*, vol. 11, Jun. 2021, doi: 10.51847/kWVD06AagO.

[19] T. Vadiveloo, P. Donnan, M. Murphy, and G. Leese, "Age- and Gender-Specific TSH Reference Intervals in People With No Obvious Thyroid Disease in Tayside, Scotland: The Thyroid Epidemiology, Audit, and Research Study (TEARS)," *J. Clin. Endocrinol. Metab.*, vol. 98, Jan. 2013, doi: 10.1210/jc.2012-3191.

[20] A. Çiftçi and E. Karaca, "Hipotiroidi Tanısı Almış KadınlarınYaşam Kalitesi ile Besin TüketimAlışkanlıkları ve Bazı AntropometrikParametreler Arasındaki İlişkininSaptanması," *Acibadem Univ. Saglik Bilim. Derg.*, vol. 12, no. 1, pp. 87–93, 2020.

[21] H. Mousa and A. Zoori, "The Prevalence of Thyroid disorders in Nasiriya City, Iraq: Thyroid disorders," *Univ. Thi-Qar J. Sci.*, vol. 10, no. 1, 2023.

[22] M. D. Ettleson, A. C. Bianco, M. Zhu, and N. Laiteerapong, "Sociodemographic Disparities in the Treatment of Hypothyroidism: NHANES 2007-2012," *J. Endocr. Soc.*, vol. 5, no. 7, pp. 1–10, 2021, doi: 10.1210/jendso/bvab041.

[23] . K. N. K., . S. A., . A. K., . M. M. S., and . G. N., "Distribution of Thyroid Patients Between Age Groups, Sex and Seasons in the Thyroid Patients Referred to Irnum Peshawar," *Journal of Medical Sciences*, vol. 1, no. 6. pp. 400–403, 2001. doi: 10.3923/jms.2001.400.403.

[24] B. Sethi, S. Barua, M. S. Raghavendra, J. Gotur, D. Khandelwal, and U. Vyas, "The thyroid registry: Clinical and hormonal characteristics of adult indian patients with hypothyroidism," *Indian J. Endocrinol. Metab.*, vol. 21, no. 2, pp. 302–307, 2017, doi: 10.4103/ijem.IJEM_387_16.

[25] N. H. Rasheed, B. Z. Al-Metwali, and M. S. M. Al Shamaa, "Evaluation of Anxiety and Depression among a Sample of Hypothyroidism-Treated Iraqi Patients," *Iraqi J. Pharm. Sci.*, vol. 32, no. 2, pp. 162–168, 2023, doi: 10.31351/vol32iss2pp162-168.

[26] F. N. Shakor, "KUFA JOURNAL FOR NURSING SCIENCES . VOL . 9 No . 2 / 2019 Assessment of the clinical concern about the non-malignant thyroid disorders in Sulaimaniyah city – Kurdistan Region – Iraq –," vol. 9, no. 2, pp. 1–14, 2019.

[27] P. Hamasaeed, S. Hussain, and S. Ashraf, "Evaluation of Thyroid Stimulating Hormone and Thyroid Hormone Concentrations in Females with Hypothyroidism and Hyperthyroidism," *Rafidain J. Sci.*, vol. 28, no. 4, pp. 1–7, 2019, doi: 10.33899/rjs.2019.163290.

[28] A. Alyahya, A. AlNaim, A. W. AlBahr, F. Almansour, and A. Elshebiny, "Knowledge of Thyroid Disease Manifestations and Risk Factors Among Residents of the Eastern Province, Saudi Arabia.," *Cureus*, vol. 13, no. 1, p. e13035, Jan. 2021, doi: 10.7759/cureus.13035.

[29] W. F. M. E. J. O. F. Medicine ; Mohammad Eid and M. Mahfouz, "Risk factors for hypothyroidism in Saudi Arabia," *World Fam. Med.*, vol. 19, no. 1, pp. 215–224, 2021, doi: 10.5742/MEWFM.2021.93972.

[30] H. Mousa and A. Zoori, "Prevalence of Thyroid disorders in Nasiriya City, Iraq," *Univ. Thi-Qar J. Sci.*, vol. 10, no. 1, pp. 122–127, 2023, doi: 10.32792/utq/utjsci/v10i1.1040.

[31] R. Kumar, C. M. Sitaram, and K. Anusha, "Clinical profile of patients with hypothyroidism," *MRIMS J. Heal. Sci.*, vol. 4, no. 2, pp. 74–76, 2016.

[32] P. Singh, P. Dubey, S. Yadav, and S. S. Yadav, "Thyroid abnormality in abnormal uterine bleeding: an observational study from Medical College in Eastern UP, India," *Int. J. Reprod. Contraception, Obstet. Gynecol.*, vol. 7, no. 1, p. 308, 2017, doi: 10.18203/2320-1770.ijrcog20175867.

[33] M. Thakur *et al.*, "Thyroid Dysfunction in Patients with Abnormal Uterine Bleeding in a Tertiary Care Hospital: A Descriptive Cross-sectional Study.," *JNMA. J. Nepal Med. Assoc.*, vol. 58, no. 225, pp. 333–337, May 2020, doi: 10.31729/jnma.5033.

[34] 3Dr. Abha Rani Sinha 1Dr. Swan Lata Das, 2Dr. Shalini Kumari, "Thyroid Dysfunction in Patient with Abnormal Uterine Bleeding," vol. 12, no. 1, pp. 85–88, 2023.

[35] Y. Kakuno *et al.*, "Menstrual disturbances in various thyroid diseases," *Endocr. J.*, vol. 57, no. 12, pp. 1017–1022, 2010, doi: 10.1507/endocrj.K10E-216.

[36] N. S. Ajmani, V. Sarbhai, N. Yadav, M. Paul, A. Ahmad, and A. K. Ajmani, "Role of Thyroid Dysfunction in Patients with Menstrual Disorders in Tertiary Care Center of Walled City of Delhi," *J. Obstet. Gynecol. India*, vol. 66, no. 2, pp. 115–119, 2016, doi: 10.1007/s13224-014-0650-0.

[37] P. Hanlon *et al.*, "Representation of people with comorbidity and multimorbidity in clinical trials of novel drug therapies: An individual-level participant data analysis," *BMC Med.*, vol. 17, no. 1, 2019, doi: 10.1186/s12916-019-1427-1.

[38] S. Khatiwada *et al.*, "Thyroid dysfunction and associated risk factors among Nepalese diabetes mellitus patients," *Int. J. Endocrinol.*, vol. 2015, pp. 3–7, 2015, doi: 10.1155/2015/570198.

[39] A. R. Abdelhai, "COMORBIDITY ASSESSMENT AND THYROID HORMONES IN INDEPENDENTLY- LIVING ELDERLY Running title: Comorbidity and thyroid hormones," no. April, 2016, doi: 10.21608/zumj.2016.4643.

[40] H. K. Jain, A. K. Sharma, and A. Mishra, "Study of clinical profile of hypothyroidism in a

tertiary care hospital, Central India," *Int. J. Health Sci. (Qassim).*, vol. 6, no. May, pp. 2594–2601, 2022, doi: 10.53730/ijhs.v6ns8.12619.

[41] J. A. Phillips, "Thyroid hormone disorder/released May 2001." 2010.

[42] R. S, "Thyroid Disorders and Diabetes Mellitus: Double Trouble," *J. Diabetes Res. Ther. (ISSN 2380-5544)*, vol. 2, no. 1, 2016, doi: 10.16966/2380-5544.113.

[43] R. C, U. E, and F. K, "INCIDENCE OF OVARIAN CYST IN HYPOTHYROIDISM: AN INSTITUTIONAL STUDY," *J. Evid. Based Med. Healthc.*, vol. 3, pp. 4236–4241, Sep. 2016, doi: 10.18410/jebmh/2016/902.

[44] M. Al-Azri, M. Al-Saidi, A.-M. Eman, and S. M. Panchatcharam, "Awareness of risk factors, symptoms and time to seek medical help of ovarian cancer amongst Omani women attending teaching hospital in Muscat Governorate, Oman," *Asian Pacific J. cancer Prev. APJCP*, vol. 19, no. 7, p. 1833, 2018.

[45] S. Mobeen and R. Apostol, "Ovarian Cyst.," Treasure Island (FL), 2024.

[46] A. Alsarray, W. Ani, and S. Abed, "Clinico-Epidemiological Study of Patients with Erectile Dysfunction Attending Al-Kadymia Teaching Hospital in Baghdad," *Indian J. Public Heal. Res. Dev.*, vol. 10, p. 1570, Jan. 2019, doi: 10.5958/0976-5506.2019.00939.2.

[47] A. T. Gabrielson, R. A. Sartor, and W. J. G. Hellstrom, "The Impact of Thyroid Disease on Sexual Dysfunction in Men and Women.," *Sex. Med. Rev.*, vol. 7, no. 1, pp. 57–70, Jan. 2019, doi: 10.1016/j.sxmr.2018.05.002.

[48] A. Kumar, S. Shekhar, and B. Dhole, "Thyroid and male reproduction.," *Indian J. Endocrinol. Metab.*, vol. 18, no. 1, pp. 23–31, Jan. 2014, doi: 10.4103/2230-8210.126523.