CMMB

ORIGINAL PAPERS

https://doi.org/10.31689/rmm.2025.32.4.411

Prevalence of Thyroid Dysfunction Among Postmenopausal Women in Baghdad Medical City

Shaymaa Kadhim JASIM[1,*], Hayder AL-MOMEN[2], Harith Abdul Rahman IBRAHIM[1], Sajad Adel Abdul HUSSEIN[1], Abdullah Ahmed MAHDI[1]

Abstract

Background: One of the most frequent endocrine abnormalities and changes in females, especially during the postmenopausal period, is thyroid dysfunction.

Objectives: To assess the prevalence and pattern of thyroid dysfunction among postmenopausal women visiting Baghdad Medical City.

Methods: A cross-sectional study was done in Baghdad Medical City over two months. A total of 469 postmenopausal women were asked, 63 were interviewed, and 50 were confirmed to have thyroid dysfunction and met our inclusion criteria, whether based on history taking or laboratory results. Data were collected through structured interviews and analyzed using SPSS. Descriptive statistics summarized sample characteristics, and the Chi-square test assessed the association between age groups and some sociodemographic variables and thyroid status.

Results: The prevalence of thyroid dysfunction among postmenopausal women was 10.66%, with hypothyroidism (58%) predominating over hyperthyroidism (42%). Most participants were illiterate (62%), unemployed (74%), and married (80%). A higher prevalence of thyroid dysfunction was observed among women with earlier menopause (45–54 years); however, this association did not reach statistical significance ($p = 0.60$). The majority (68%) experienced natural menopause, while (32%) had surgical menopause.

Conclusion: Thyroid dysfunction represents a notable endocrine disorder among postmenopausal women in Baghdad, with hypothyroidism being the predominant form.

Keywords: Baghdad, Menopause, Thyroid, Women.

[1]Department of Obstetrics and Gynecology, College of Medicine, University of Baghdad, Baghdad, Iraq
[2]Department of Pediatrics, Al-Kindy College of Medicine, University of Baghdad, Baghdad, Iraq

***Corresponding author:**
Shaymaa Kadhim JASIM, Department of Obstetrics and Gynecology, College of Medicine, University of Baghdad, Baghdad, Iraq
E-mail: shaimaa79kadhim@yahoo.com

INTRODUCTION

Thyroid dysfunctions represent a spectrum of disorders differing from either excessive or insufficient synthesis of thyroid hormones, primarily thyroxine (T_4) and triiodothyronine (T_3). These hormones regulate the metabolic processes – examples are cellular respiration, thermogenesis, cardiovascular performance, and cognitive function. Dysfunction of this system, whether in the form of hypothyroidism or hyperthyroidism, therefore, carries important systemic consequences and represents one of the most common endocrine disorders worldwide, particularly among women. Epidemiological studies have consistently demonstrated a three- to five-fold higher prevalence of thyroid disease in women than in men, underscoring the strong hormonal and immunological interplay underlying thyroid regulation.[1,2]

Menopause, defined by the permanent stoppage of ovarian follicular activity and the consequent hypoestrogenic state, marks a transition in a woman's endocrine and metabolic profile. Besides its reproductive implications, menopause induces widespread systemic changes that extend to thyroid physiology. Estrogen has multiple regulatory effects on the hypothalamic–pituitary–thyroid (HPT) axis. It stimulates hepatic synthesis of thyroxine-binding globulin (TBG), thereby increasing circulating bound thyroid hormones and modifying free hormone availability. Estrogen also modulates thyrotropin-releasing hormone (TRH) and thyroid-stimulating hormone (TSH) secretion and influences peripheral conversion of T_4 to T_3 through its effects on deiodinase enzymes, particularly type I and II isoforms. The decline in estrogen levels during menopause decreases TBG concentrations, changes deiodinase activity, and deregulates the normal feedback sensitivity of the HPT axis.[3,4]

Furthermore, estrogen exerts important anti-inflammatory and immunomodulatory actions that contribute to the maintenance of immune tolerance. Its stoppage during menopause enhances autoreactive immune activity, predisposing women to autoimmune thyroid diseases such as Hashimoto's thyroiditis – the principal cause of hypothyroidism in this demographic[5,6]. These mechanisms collectively explain the increased vulnerability of postmenopausal women to both overt and subclinical thyroid dysfunction.

Clinically, this relationship presents a diagnostic challenge. The symptomatology of thyroid disease – fatigue, mood changes, sleep disturbance, weight fluctuation, palpitations, and thermoregulatory intolerance – overlaps significantly with that of menopause. Consequently, thyroid disorders in postmenopausal women are often underdiagnosed or misattributed to menopausal transition itself, delaying proper intervention. Such diagnostic ambiguity can exacerbate metabolic and cardiovascular complications, including dyslipidemia, osteoporosis, and accelerated atherosclerosis.[7-9]

Globally, the prevalence of thyroid dysfunction in postmenopausal women ranges between 7% and 20%, with substantial regional variation depending on iodine intake, genetics, and access to healthcare[10,11]. Studies from neighboring Middle Eastern countries, such as Iran and Jordan, report similar prevalence rates, emphasizing the importance of regional determinants such as iodine nutrition and autoimmune predisposition. However, epidemiological data from Iraq remain limited despite the country's ongoing demographic transition and increasing burden of noncommunicable diseases.[10-13]

The relationship between menopause and thyroid dysfunction has been the focus of extensive investigation, as both conditions intersect through shared endocrine and immunologic pathways. Recent evidence emphasizes that the decline in ovarian hormones – particularly estrogen – during menopause alters the sensitivity of the hypothalamic–pituitary–thyroid axis and may unmask latent thyroid disorders. Estrogen normally modulates hepatic thyroxine-binding globulin synthesis and peripheral deiodinase activity; its loss reduces circulating binding capacity and modifies T_4-to-T_3 conversion efficiency, contributing to subtle shifts in thyroid homeostasis that may manifest as subclinical or overt dysfunction.[10,12,14]

Furthermore, postmenopausal hypoestrogenism enhances pro-inflammatory cytokine activity and reduces immune tolerance, creating conditions favorable for autoimmune thyroiditis. The European Menopause and Andropause Society (EMAS) recently reaffirmed this mechanistic link, noting that estrogen withdrawal increases the risk of Hashimoto's thyroiditis and, consequently, hypothyroidism in midlife and older women.[11,12]

Epidemiological studies consistently report hypothyroidism as the predominant thyroid disorder among postmenopausal women. A Korean population study identified a marked rise in both overt and subclinical hypothyroidism after menopause, while regional studies from the Middle East demonstrated comparable findings, suggesting a similar hormonal and environmental influence. An Iraqi study from Nasiriya (2023) found hypothyroidism to be the most frequent thyroid disorder among women attending endocrine clinics, underscoring the need for systematic screening and further multicentric data collection.[15-17]

Epidemiological Evidence: Global and Regional Patterns

Large cohort studies reveal that the prevalence of thyroid dysfunction among women rises in the menopausal period. A Korean screening study found significantly higher rates of overt and subclinical hypothyroidism in women after menopause compared to pre-menopause. Regional Middle East data mirrors this trend. Importantly, these studies also highlight that the prevalence estimates vary widely (typically 7-20%) depending on definition (overt vs subclinical), iodine status, autoimmunity, and age- distribution of the cohort.[18,19]

Knowledge Gaps and Research Directions

Despite the mechanistic explanation and accumulating epidemiological data, important gaps remain: (1) Few studies include thyroid autoantibody profiles alongside menopause variables, making causal inference about autoimmunity limited. (2) Many reports do not adjust for age and other comorbidities (e.g., diabetes, hypertension), which may confound associations seen in postmenopausal women. (3) There is a shortage of large, population-based studies in the Iraqi context, particularly focusing exclusively on post-menopausal women and thyroid outcomes. (4) Longitudinal data tracking transitions from euthyroid to dysfunction in relation to menopause timing and hormonal change are scarce. Addressing these gaps would enhance our ability to identify high-risk subgroups and refine screening strategies in mid-life women.

This study aimed to assess the prevalence and patterns of thyroid dysfunction in a sample of postmenopausal women attending the Baghdad Medical City complex and to investigate its association with sociodemographic factors, clinical parameters, and menopausal-related changes.

PATIENTS AND METHODS

Study Design

A cross-sectional study among postmenopausal women was conducted for two months in Baghdad's medical city complex from the first of July to the first of September 2025.

Study Population

The target population was the post-menopausal women who visited the endocrine clinic and/or the obstetrics and gynecology (OB/GYN) clinic in Baghdad Medical City during this period.

The Inclusion Criteria

Postmenopausal women aged 45 and above with No prior thyroid dysfunction diagnosis or treatment before menopause.

The Exclusion Criteria

Women with pre-existing diagnosed thyroid disorders before menopause. Those with a history of thyroid surgery or malignancy were also excluded.

Operational Definition

Thyroid abnormality was defined as any deviation of serum thyroid stimulating hormone (TSH), free T3, or free T4 from the reference range provided by the hospital laboratory.

Data Collection

Extensive data were collected through structured questionnaires only with postmenopausal women with thyroid abnormalities that we identified during the study period. Every interviewed postmenopausal woman was then informed of the nature and purpose of the study and was invited to participate in the study.

Our questionnaire included questions about demographic info (such as age, gender, and marital status, etc.) as well as clinical info regarding thyroid abnormalities (type of thyroid disease, signs and symptoms) and laboratory findings (thyroid stimulating hormone TSH, T4, T3).

Data Analysis

Analysis was performed using Statistical Package for the Social Sciences (SPSS) software, version 26 and we obtained descriptive data (such as mean, prevalence, and chi- square) accordingly.

Ethical Approval

Ethical approval from the University of Baghdad/ College of Medicine/ Ethics Committee was acquired. Informed consent was obtained from all participants, and participant confidentiality and privacy were ensured.

RESULTS

The ages in this study were classified into three age-groups: 45-54 {42% (n=21)}, 55-64 {32% (n=16)}, and 65-74 {26% (n=13)} (Figure 1).

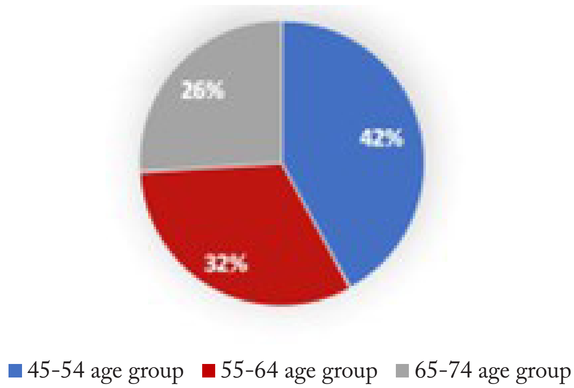

Figure 1. Age distribution

A total of 50 positive samples with thyroid abnormalities were obtained out of 469 visitors in the two-month period. Giving a prevalence of (10.66%) (Figure 2). Over half of the positive cases, we're hypothyroid {58% (n=29)}, while {42% (n=21)} we're hyperthyroid (Figure 3).

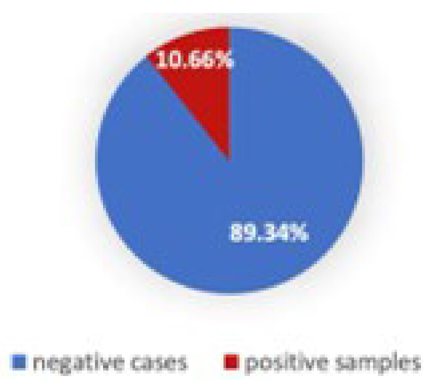

Figure 2. Thyroid cases' distribution

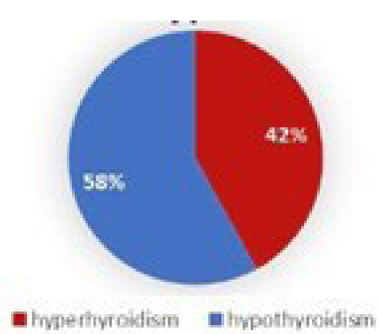

Figure 3. Thyroid disease`s type

We assessed the association and distribution of thyroid abnormality across the three age groups; the results were insignificant with a P value of 0.602 (Table 1).

Table 1: *The association between the type of thyroid abnormality and the different age groups.*

Age group	Hyperthyroidism	Hypothyroidism	Total	P value
45-54	8	13	21	0.602
55-64	6	10	16	
65-74	7	6	13	

We then assessed multiple factors of different categories that might play a role in the development of thyroid disease, regarding the type of menopause: 68% (n=34) had natural menopause, while 32% (n=16) had surgical menopause.

80% (n=40) were married, 14% (n=7) were single, and 6% (n=3) were widows. 23 (46%) had positive family history for thyroid disease, while 27 (54%) had negative family history.

Regarding Their Education Status: 31 (62%) were illiterate, 7 (14%) had primary education, 6 (12%) had secondary education, and 6 (12%) had tertiary education.

Regarding Concomitant Diseases: 9 (18%) percent had osteoporosis, 9 (18%) percent had arthritis, 10 (20%) had hypertension, 6 (12%) had DM, 6 (12%) had a current or past history of breast carcinoma, and only 7 (16%) had no concomitant diseases.

Finally, only 13 (26%) were employed, and the other 37 (74%) were housewives.

Table 2: *Descriptive variables of some general variables among participants.*

Variable	Mean	Minimum	Maximum
Age	57.6	47	74
Age at menopause	45.5	39	57
BMI hypothyroid patients	37.9	21.2	31.6
BMI hyperthyroid patients	22.4	3	43.3
TSH level in hypothyroid patients	8.9	8.4	9.9
TSH level in hyperthyroid patients	0.3	0.01	0.6

***Table 3:** distribution and percentage of risk factors in thyroid disease patients.*

Statistic Type		Number	Percentage
Menopause	Natural	34	68%
	Surgical	16	32%
Marital status	Married	40	80%
	Single	7	14%
	Widow	3	6%
Education status	Illiterate	31	62%
	Primary	7	14%
	Secondary	6	12%
	Tertiary	6	12%
Family History	positive	23	46%
	negative	27	57%
Employment Status	employed	13	26%
	unemployed	37	74%
Concomitant Diseases	DM	6	12%
	HTN	10	20%
	Arthritis	9	18%
	Osteoporosis	9	18%
	Breast Cancer	6	12%

DISCUSSION

The number of samples acquired was 50 cases among 469 postmenopausal female participants that met the inclusion criteria and visited the obstetrics/gynecology (OB/GYN) and endocrine clinics between the first of July to the first of September. The participants were divided into three groups based on the age of menopause: the first between 45-54, the second between 55-64, and the last between 65-74.

A chi-squared test was used to find the significance of the association between age at menopause and thyroid status. The analysis showed a significant relation between the age of menopause and thyroid status. A higher prevalence of thyroid disease among females with a younger menopause age (45 – 54), while an older menopause age has a lesser prevalence, with hypothyroidism having a higher prevalence than hyperthyroidism. Considering the pro-inflammatory actions in post-menopause occurring due to low levels of estrogen, this could explain the higher prevalence of thyroid disease in participants with an earlier age at menopause.[20-22]

Since menopause is a stage of adaptive metabolic reactions in which the thyroid plays a significant role. Thyroid hormones and estrogen play a reciprocal role in the metabolism of each other by increasing the concentrations of binding globulins, thus reducing the clearance of the hormones from the circulation. However, this relation becomes ambiguous in the menopausal stage, causing difficulty in the diagnosis of thyroid dysfunction[23,24]. This in addition to the effect of estrogen on the action of deiodinases could explain the hyperthyroid state in post-menopause.

There were 46% with a positive family history, indicating a genetic component of the disease that could potentiate the effects of menopausal syndrome on thyroid function.[25-27]

An unexpected result shown was that most females attending the clinics were illiterate (62%), with the rest distributed between elementary (14%), secondary (12%), and university (12%) degrees. This could indicate a socioeconomic factor in disease awareness and health access.[28,29]

The research shows that thyroid disease is indeed prevalent among post-menopausal females, with hypothyroidism being predominant in accordance with research done in this field.

Previous studies have been conducted in this field and have shown significant results. A study conducted by Pavlovska et al. showed a prevalence of 64% among post-menopausal females with menopause syndrome, with subclinical hypothyroidism being most prevalent (53%). Other studies had similar results.[30-33]

In addition, another study conducted by Usha et al. concluded that the prevalence of thyroid disease is higher among females between 46-50 years of age compared to females between 51-55 years, with a significant change in TSH level and minor changes in levels of T3 and T4.[3]

A Korean paper done by Kim et al. showed that overt hypothyroidism was significantly prevalent in females in the late transition of menopause and post-menopause stages. Another study conducted by Yadav et al. showed that in a group of 150 females, including both pre- and post-menopause states, there were 53% normal cases, 13% with overt hypothyroidism, 3% with hyperthyroidism, and 23% with subclinical hypothyroidism.[1,23]

Further research could focus on a larger sample size from multiple centers with further detailed history, physical examinations, and investigations of their thyroid and estrogen hormone status, with additional imaging if necessary. Also, due to the overlap of symptoms between menopausal syndrome and thyroid disease, this makes clinical assessment inconclusive in diagnosing thyroid disease, thus urging physicians to assess thyroid status using investigation for this age group, particularly due to the increased risk of developing subclinical hypothyroidism with increasing age.[34-36]

Limitations

Due to the short period of time for sample collection and the rarity of the cases, this resulted in the sample size being small. Also, due to facility limitations, we could not assess the hormone status of the participants. Also, the sample was collected from one center, making the sample not truly representative of the general population of post – menopausal females in Baghdad. However, the involved setting is the most important tertiary center in the city.

CONCLUSION

This study underscores that thyroid dysfunction is a prevalent and clinically significant among postmenopausal women in Baghdad, with hypothyroidism emerging as the dominant form. The findings support the hypothesis that estrogen deficiency, coupled with immune and metabolic alterations, contributes to thyroid dysregulation following menopause.

Although the relationship between menopause and thyroid health is multifactorial, the observed pattern – higher prevalence among women with earlier menopause and positive family history – suggests a combined hormonal and genetic predisposition.

Given the symptom overlap between menopausal transition and thyroid disease, clinicians should maintain a low diagnostic threshold for thyroid testing in this population.

Acknowledgements:

Great thanks to the paramedical and editorial staff of the involved hospital for their valuable assistance.

References

1. Kim Y, Chang Y, Cho IY, Kwon R, Lim GY, Jee JH, Ryu S, Kang M. The Prevalence of Thyroid Dysfunction in Korean Women Undergoing Routine Health Screening: A Cross-Sectional Study. Thyroid. 2022 Jul;32(7):819-827. doi: 10.1089/thy.2021.0544. Epub 2022 May 16. PMID: 35293242.
2. KHAMOSHINA MB, PUGA DP, SHCHEGLOV BO, KOVAL IP, REVA IV, SHCHEGLOVA SN, STEGNIY KV, REVA GV. Assessment of the Level of Expression Activity and Localization of Cd-Receptors in the Postmenopausal Period. Modern Medicine. 2024 Jul 1;31(3).
3. Usha SMR, Bindu CM, Chandrika N. Thyroid Dysfunction: An Alternate Plausibility in Perimenopausal Women! J Midlife Health. 2022 Oct- Dec;13(4):300-303. doi: 10.4103/jmh.jmh_67_22. Epub 2023 Apr 28. PMID: 37324792; PMCID: PMC10266572.
4. PAULET FP, MEHEDINTU C, ANTONOVICI M, CIRSTOIU MM. Pandora's Box: Autoimmune Hypothyroidism Treatment During Pregnancy. Modern Medicine. 2021 Oct 1;28(4).
5. Pavlovska O, Savelyeva O, Pavlovska K. Thyroid dysfunction in women with a menopausal syndrome. Prz Menopauzalny. 2024 Sep;23(3):145-151. doi: 10.5114/pm.2024.143481. Epub 2024 Oct 14. PMID: 39464495; PMCID: PMC11504480.
6. Jasim SK, Al-Momen H, Wahbi MA. Treatment options of adolescent gestational diabetes: effect on outcome. Pakistan Journal of Medical Sciences. 2021 Jul;37(4):1139.
7. Yadav M, Kose V, Bhalerao A. Frequency of Thyroid Disorder in Pre- and Postmenopausal Women and Its Association With Menopausal Symptoms. Cureus. 2023 Jun 24;15(6):e40900. doi: 10.7759/cureus.40900. PMID: 37492845; PMCID: PMC10365143.
8. Frank-Raue K, Raue F. Thyroid Dysfunction in Periand Postmenopausal Women-Cumulative Risks. Dtsch Arztebl Int. 2023 May 5;120(18):311-316. doi: 10.3238/arztebl.m2023.0069. PMID: 37013812; PMCID: PMC10398375.
9. Rija FF, Hussein SZ, Abdalla MA. Study the effect of some adipokines and interleukins in hypo and hyperthyroidism patients. Mod Med. 2023 Oct 1;30:199-203.
10. Müller P, Leow MK, Dietrich JW. Minor perturbations of thyroid homeostasis and major cardiovascular endpoints – physiological mechanisms and clinical evidence. Front Cardiovasc Med. 2022;9:942971.
11. Mintziori G, Veneti S, Poppe K, et al. EMAS position statement: Thyroid disease and menopause. Maturitas. 2024;175:107991. Available from: https://emas-online.org/wp- content/uploads/2024/04/PIIS0378512224000860.pdf .
12. Daher AM, Al-Momen H, Jasim SK. Deferasirox in thalassemia: a comparative study between an innovator drug and its copy among a sample of Iraqi patients. Therapeutic advances in drug safety. 2019 Oct;10:2042098619880123.
13. Al-Asadi FA, Jasim SK. Accuracy of office hysteroscopy in diagnosis of endometrial pathologies compared to ultrasound and histopathology in Baghdad Teaching Hospital. Journal of Population Therapeutics and Clinical Pharmacology= Journal de la Therapeutique des Populations et de la Pharmacologie Clinique. 2022 Aug 18;29(3):e104-8.
14. Niculescu D, Dusceac R, Caragheorgheopol A, Ismail G,

Poiana C. Parathyroid Hormone-Related Bone Loss in End-Stage Renal Disease: Where to Measure?. Modern Medicine. 2015 Nov 1;22(4):333-8.
15. Taylor PN, Davies TF. Age-related variation in thyroid function – implications for diagnosis and management. Thyroid Res. 2023;16:10. Available from: https://thyroidresearchjournal.biomedcentral.com/articles/10.1186/s13044- 023-00149-5.
16. Jasim SK, Al-Momen H, Alqurishi AK. Effects of excessive tea consumption on pregnancy weight gain and neonatal birth weight. Obstetrics & Gynecology Science. 2021 Jan 1;64(1):34-41.
17. Al-Momen H, Jasim SK, Alqurishi AK, Olewi AO, Obaid AA, Hussein HK, et al. Prevalence of Prematurity Outcomes of Overweight Adolescent Pregnancy in One Thousand Premature Neonates in Baghdad. Medicina Moderna. 2025;32(2):175–9.
18. Jasim SK, Al-Momen H, Obaid AA. Differences in perinatal outcomes in teenage mothers with their first and third pregnancies and predictors of adverse neonatal events: A cross-sectional study. International journal of reproductive biomedicine. 2021 Dec 13;19(11):1005.
19. Mazer NA. Interaction of estrogen therapy and thyroid hormone replacement in postmenopausal women. Thyroid. 2004;14 Suppl 1:S27–34. doi:10.1089/105072504323024561. PMID: 15142374.
20. KAMIL RA, ABUBAKER NE, MOHAMED SA, IBRAHIM MA, ABD ALLA AB. Evaluation of Thyroid Hormones and Anti-Thyroglobulin Antibodies among Sudanese Polycystic Ovarian Syndrome Patients. Modern Medicine. 2020;27(3):192.
21. Ji J, Li Z, Xue L, Xue H, Wen T, Yang T, Ma T, Tu Y. The impact of thyroid function on total spine bone mineral density in postmenopausal women. Endocrine. 2024 Jul;85(1):279–286. doi:10.1007/s12020-024-03712-8. Epub 2024 Feb 3. PMID: 38308787.
22. Al-Momen H, Jasim SK, Hassan QA, Ali HH. Relationship between liver iron concentration determined by R2-MRI, serum ferritin, and liver enzymes in patients with thalassemia intermedia. Blood research. 2018 Dec;53(4):314-9.
23. Alzahrani AS, Al Mourad M, Hafez K, Almaghamsy AM, Alamri FA, Al Juhani NR, Alhazmi AS, Saeedi MY, Alsefri S, Alzahrani MDA, Al Ali N, Hussein WI, Ismail M, Adel A, El Bahtimy H, Abdelhamid E. Diagnosis and management of hypothyroidism in Gulf Cooperation Council (GCC) countries. Adv Ther. 2020 Jul;37(7):3097–3111. doi:10.1007/s12325-020- 01382-2. Epub 2020 Jun 1. PMID: 32488819.
24. TIWARI R, GUPTA R, VERMA AK, KUMAR S, KATIYAR Y. Radio pathological correlation of thyroid nodules using TIRADS based ultrasound classification and Bethesda Classification for FNAC: a prospective study. Modern Medicine. 2020;27(3):210.
25. Jasim SK, Al-Momen H, Mahdi ZI, Almomen R. Obstetric and neonatal complications in large for gestational age pregnancy with late gestational diabetes. Journal of the Turkish German Gynecological Association. 2023 Mar 15;24(1):12.
26. Mintziori G, Veneti S, Poppe K, Goulis DG, Armeni E, Erel CT, Fistonić I, Hillard T, Hirschberg AL, Meczekalski B, Mendoza N. EMAS position statement: Thyroid disease and menopause. Maturitas. 2024 Jul 1;185:107991.
27. Jasim SK, Al-Momen H, Wahbi MA, Almomen R. Maternal and neonatal outcomes in adolescent pregnant women with one prior Cesarean section in Baghdad. Journal of the Turkish German Gynecological Association. 2023 Jun 7;24(2):86.
28. Al-Momen H, Hussein HK, Al-Attar Z, Hussein MJ. Green tea influence on iron overload in thalassemia intermedia patients: a randomized controlled trial. F1000Research. 2020 Sep 16;9:1136.
29. Jasim SK, Olewi AO, Al-Asadi F, Al-Momen H, Hussein MJ, Majeed BA, Almomen R. Obstetric and Neonatal Outcomes in Overweight Adolescent Pregnant Mothers: S. Kadhim Jasim et al. The Journal of Obstetrics and Gynecology of India. 2025 Apr;75(Suppl 1):274-9.
30. Yadav M, Kose V, Bhalerao A. Frequency of thyroid disorder in pre- and postmenopausal women and its association with menopausal symptoms. Cureus. 2023 Jun 24;15(6):e40900. doi:10.7759/cureus.40900. PMID: 37492845; PMCID: PMC10365143.
31. Jasim SK, Daad R, Olewi AO, Al-Momen H, Almomen R. Twin pregnancy: adolescents versus adults. Journal of the Turkish German Gynecological Association. 2025 Sep 3;26(3):174.
32. Zhao H, Zhang Y, Jiang X, Wang W, Hu X, Yang Y, et al. Association between thyroid disorders and osteoporosis in postmenopausal women: A systematic review and meta-analysis. Front Endocrinol (Lausanne). 2021;12:703366.
33. Jasim SK, Al-Momen H, Al-Naddawi AM. Prediction of maternal diabetes and adverse neonatal outcome in normotensive pregnancy using serum uric acid. Int J Res Pharm Sci. 2019;10(4):3563-9.
34. Krajcovicova K, Maclaren K, Mavrogeni S, McKillop G, Gopinath D, Elsherbini AM, et al. Thyroid dysfunction and cardiovascular disease: Unraveling the link. J Clin Endocrinol Metab. 2023;108(6):1489-1502.
35. Al-Momen H, Hussein HK, Al-Attar Z, Hussein MJ. Green tea influence on iron overload in thalassemia intermedia patients: a randomized controlled trial. F1000Research. 2020 Sep 16;9:1136.
36. Salih AL-ASADI FA, JASIM SK. Pregnancy Rate Following Different Types of Hysteroscopic Polypectomy in Iraqi Women with Subfertility. Medicina Moderna. 2025 Jan 1;32(1).