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PREVALENCE OF SUBCLINICAL HYPOTHYROIDISM IN WOMEN WITH ABNORMAL UTERINE BLEEDING

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ABSTRACT

Background: Abnormal uterine bleeding is a common gynecological condition among women of reproductive age and is frequently associated with endocrine disorders, particularly thyroid dysfunction. Subclinical hypothyroidism has been increasingly recognized as a potential contributor to menstrual irregularities. **Objectives:** To determine the prevalence of subclinical hypothyroidism among women presenting with abnormal uterine bleeding and to evaluate its association with different clinical patterns of abnormal uterine bleeding and selected demographic factors. **Methods:** This cross-sectional study was conducted at Um Al-Baneen Private Hospital in Baghdad from September 2023 to December 2025. A total of 120 women aged 18–45 years presenting with abnormal uterine bleeding were included. Serum thyroid-stimulating hormone and free thyroxine levels were measured to assess thyroid function. Subclinical hypothyroidism was defined as elevated thyroid stimulating hormones with normal thyroxin levels. Data were analyzed using descriptive statistics, chi-square test, and logistic regression analysis, with a p-value <0.05 considered statistically significant. **Results:** The mean age of participants was 31.6 ± 6.4 years, and the mean BMI was 28.1 ± 4.8 kg/m². Subclinical hypothyroidism was detected in 22 patients (18.3%), while 86 (71.7%) were euthyroid. Menorrhagia was the most common bleeding pattern (43.3%) and showed a significant association with subclinical hypothyroidism (p = 0.041). Women with SCH were significantly older than non-SCH participants (33.8 ± 5.9 vs 31.1 ± 6.5 years, p = 0.048). Logistic regression analysis revealed that age >30 years (OR = 1.94, 95% CI: 1.02–3.68, p = 0.042) and menorrhagia (OR = 1.73, 95% CI: 1.01–3.45, p = 0.039) were significant predictors of SCH, while BMI was not significantly associated. **Conclusion:** Subclinical hypothyroidism is relatively prevalent among women with abnormal uterine bleeding and is significantly associated with menorrhagia and increasing age. These findings highlight the importance of routine thyroid function screening in women presenting with abnormal uterine bleeding, as early detection and management of subclinical hypothyroidism may improve clinical outcomes.

KEYWORDS: Abnormal uterine bleeding, Reproductive health, Thyroid dysfunction.

1-INTRODUCTION

Abnormal uterine bleeding (AUB) is one of the most prevalent gynecological problems among women of reproductive age, accounting for a significant number of outpatient visits globally. It is characterized as any variation from typical menstrual patterns in terms of frequency, duration, regularity, or volume of bleeding. Abnormal uterine bleeding significantly affects women's quality of life and may indicate underlying systemic, structural, or endocrine problems.[1,2]

The etiology of AUB is multifactorial and it is commonly classified using the PALM-COEIN system, which includes structural causes such as polyps, adenomyosis, leiomyoma, and malignancy, as well as non-structural causes such as coagulopathy, ovulatory dysfunction, endometrial disorders, iatrogenic causes, and uncategorized conditions. Among these, ovarian dysfunction is usually linked to endocrine problems, notably thyroid disorders.[2,3]

Thyroid hormones play an important role in regulating the hypothalamic-pituitary-ovarian (HPO) axis and are required for normal menstruation. They have an impact on gonadotropin-releasing hormone secretion, ovarian follicular growth, and the peripheral metabolism of estrogen and progesterone. Even modest thyroid dysfunction can disrupt menstruation cyclicity, resulting in a variety of clinical symptoms including menorrhagia, oligomenorrhea, polymenorrhea, and amenorrhea.[3,4]

Subclinical hypothyroidism (SCH), characterized as high serum thyroid-stimulating hormone (TSH) levels but normal circulating free thyroxine (FT4), is a common endocrine condition, especially among women of reproductive age. Although generally asymptomatic, SCH is now recognized as a cause of menstrual irregularities and reproductive problems. It may affect ovulation, alter endometrial receptivity, and interfere with coagulation pathways, all of which contribute to irregular uterine bleeding.[4,5]

Recent studies have found a higher prevalence of thyroid dysfunction, particularly SCH, among women with AUB than in the general population. A 2024 study found that roughly 13-15% of women with AUB had subclinical hypothyroidism, with menorrhagia being the most frequent symptom.[6] Other recent studies have found that thyroid problems may be present in up to 20-25% of women with menstrual irregularities, indicating a strong association between thyroid dysfunction and AUB.[7,8]

The underlying mechanisms that link SCH and AUB are complicated, involving changes in prolactin levels, sex hormone-binding globulin (SHBG), estrogen metabolism, and coagulation factors. Furthermore, accumulating evidence suggests that endocrine and metabolic interactions play a key role in menstrual abnormalities, emphasizing the significance of a full hormonal evaluation in women with AUB.[9]

Despite expanding worldwide evidence, there is a lack of locally generated data on the frequency of subclinical hypothyroidism among women with unexplained uterine bleeding in Iraq. Given that SCH is potentially reversible and easily curable, early detection could improve clinical results and reduce the need for needless procedures. As a result, the purpose of this study is to investigate the incidence of subclinical hypothyroidism among women who present with abnormal uterine bleeding and to assess its association with various clinical patterns of AUB.

2-PATIENTS AND METHODS

This cross-sectional study was conducted at Um Al-Baneen private Hospital in Baghdad during the period from September 2023 to December 2025. A total of 120 women of reproductive age (18–45 years) presenting with complaints of abnormal uterine bleeding were enrolled in the study. Abnormal uterine bleeding was defined according to standard clinical criteria as any deviation from normal menstrual patterns in terms of frequency, duration, regularity, or volume. Participants were recruited using a consecutive sampling technique from outpatient gynecology and internal medicine clinics.

Women aged 18 to 45 with clinically confirmed AUB who provided informed consent were eligible to participate. Women were excluded if they had a known thyroid disorder (overt hypothyroidism or hyperthyroidism), were currently taking thyroid medications, had pregnancy-related bleeding, known structural uterine abnormalities (such as fibroids, polyps, or malignancy confirmed by ultrasound), bleeding disorders, or had used hormonal therapy within the previous three months. Patients suffering from chronic systemic conditions such as liver disease, kidney disease, or autoimmune disorders were also excluded.

Data were collected by a structured questionnaire administered during direct interview. Demographic variables (age, marital status), menstruation history (cycle regularity, duration, and amount of bleeding), obstetric history, and relevant medical history were also collected. AUB patterns were classified as menorrhagia, metrorrhagia, polymenorrhea, oligomenorrhea, or mixed based on clinical presentation. All of the study participants underwent a full clinical evaluation, which included a general and pelvic examination as needed. Body mass index (BMI) was computed using a standard formula (kg/m²) based on anthropometric measures, including weight and height.

Venous blood samples (5 mL) were collected from each participant under aseptic circumstances. Serum thyroid function tests, including thyroid-stimulating hormone (TSH) and free thyroxine (FT4), were conducted using enzyme-linked immunosorbent assay (ELISA) or chemiluminescent immunoassay techniques, depending on laboratory availability. Subclinical hypothyroidism was described as increased TSH readings (>4.0-4.5 mIU/L, depending on the laboratory's reference range) and normal FT4 levels.

Statistical analysis involved descriptive statistics. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. The prevalence of subclinical hypothyroidism was calculated as a proportion of the total study population. Associations between SCH and different AUB patterns were assessed using the chi-square test. Independent t-test or Mann–Whitney U test was used to compare continuous variables as appropriate. A p-value of less than 0.05 was considered statistically significant.

3- RESULTS

A total of 120 women with abnormal uterine bleeding (AUB) were included in this study. The mean age of participants was 31.6 ± 6.4 years, and the mean body

mass index (BMI) was 28.1 ± 4.8 kg/m². Moreover, 98 (81.7%) patients were married, 36 (30%) were nulliparous and 84 (70%) were multiparous. As shown in table 1.

Table 1: Basic characteristics of the study patients (number = 120).

Diagnosis	Mean ± SD / number (%)
Age (years)	31.6 ± 6.4
BMI (kg/m²)	28.1 ± 4.8
Married	98 (81.7%)
Nulliparous	36 (30.0%)
Multiparous	84 (70.0%)

Table 2 shows types of abnormal uterine bleeding among the study patients. Menorrhagia was prevalent among 52 (43.3%) patients, polymenorrhea was prevalent among 26 (21.7%) patients, metrorrhagia among 26 (21.7%) patients, oligomenorrhea among 14 (11.7%) patients and mixed pattern among 6 (5%) patients.

Table 2: Type of abnormal uterine bleeding among the study patients (number = 120).

Type of abnormal uterine bleeding	Number	Percent
Menorrhagia	52	43.3%
Polymenorrhea	26	21.7%
Metrorrhagia	22	18.3%
Oligomenorrhea	14	11.7%
Mixed pattern	6	5%

Table 3 shows thyroid function status of the study patients. Euthyroid state was prevalent among 86 (71.7%) patients, subclinical hypothyroidism among 22 (18.3%) patients, overt hypothyroidism among 8 (6.7%) patients and hyperthyroidism among 4 (3.3%) patients.

Table 3: Thyroid function status of the study patients (number = 120).

Thyroid status	Number	Percent
Euthyroid	86	71.7%
Subclinical hypothyroidism	22	18.3%
Overt hypothyroidism	8	6.7%
Hyperthyroidism	4	3.3%

Table 4 shows comparison between patients with subclinical hypothyroidism and patients without subclinical hypothyroidism regarding different types of abnormal uterine bleeding. Statistically significant difference (P value = 0.041) was present between them with regard to menorrhagia.

Table 4: Comparison between patients with subclinical hypothyroidism and patients without subclinical hypothyroidism regarding different types of abnormal uterine bleeding (number = 120).

Type of abnormal uterine bleeding	Subclinical hypothyroidism =22	Non subclinical hypothyroidism =22	P value
Menorrhagia	12 (54.5%)	40 (40.8%)	**0.041**
Polymenorrhea	4 (18.2%)	22 (22.4%)	0.612
Metrorrhagia	3 (13.6%)	19 (19.4%)	0.488
Oligomenorrhea	2 (9.1%)	12 (12.2%)	0.653
Mixed pattern	1 (4.6%)	5 (5.1%)	0.921

Table 5 shows comparison between patients with subclinical hypothyroidism and patients without subclinical hypothyroidism regarding their mean of ages and BMI. Statistically significant difference (P value = 0.048) was present between them with regard to their mean of ages.

Table 5: Comparison between patients with subclinical hypothyroidism and patients without subclinical hypothyroidism regarding their mean of ages and BMI variables (number = 120).

Variable	Subclinical hypothyroidism =22	Non subclinical hypothyroidism =22	P value
Age, mean ± SD	33.8 ± 5.9	31.1 ± 6.5	**0.048**
BMI, mean ± SD	29.6 ± 4.5	27.7 ± 4.8	0.072

Table 6 shows association between subclinical hypothyroidism and different variables included in the study. It's evident that subclinical hypothyroidism had statistically significant association with patient's age of more than 30 years and menorrhagia (odds ratio = 1.94 and 1.73) respectively.

Table 6: Association between subclinical hypothyroidism and different variables included in the study.

Variable	Odds ratio	95 %Confidence interval	P value
Age more than 30 years	**1.94**	**1.02 – 3.68**	**0.042**
Body mass index ≥30 kg/m²	1.67	0.85 – 3.28	0.136
Menorrhagia	**1.73**	**1.01 – 3.45**	**0.039**

4. DISCUSSION

The current study found that subclinical hypothyroidism was prevalent in 18.3% of patient who presented with abnormal uterine bleeding, indicating a rather high prevalence when compared to the general population. This observation emphasizes the clinical significance of assessing thyroid function in women with menstrual disorders. The found prevalence is comparable with recent studies demonstrating that SCH affects 10-20% of women with AUB, indicating a significant association between mild thyroid dysfunction and menstrual irregularities.[10,11]

Menorrhagia was the most common bleeding pattern in this study, and it had a significant association with subclinical hypothyroidism. This finding is consistent with other study, which has shown that hypothyroidism, even in its subclinical form, is frequently related with significant menstrual bleeding. The underlying mechanisms are complex, with poor estrogen metabolism, reduced levels of sex hormone-binding globulin (SHBG), and changes in coagulation factors all contributing to a hyperestrogenic state and excessive endometrial growth.[12,13] Recent clinical evidence has confirmed that thyroid dysfunction, particularly SCH, is strongly associated to menorrhagia as the most common clinical manifestation.[14]

The current study also found that women with SCH were significantly older than non-SCH women, with age higher than 30 years being a major predictor of SCH. This finding is consistent with epidemiological data indicating that the prevalence of thyroid dysfunction rises with age, especially among women.[15] This rise could be attributed to age-related changes in thyroid physiology, as well as increased autoimmune thyroid disease. Similar findings have been reported in recent regional and international study, with age being identified as an important risk factor for subclinical hypothyroidism.[16]

Although women with SCH had a higher body mass index (BMI) in this study, the association was not statistically significant. This finding is consistent with previous study, which found a trend toward increased BMI in patients with thyroid disease but no reach the level of significancy.[17] Obesity, however, may still play a role by influencing hormonal balance and thyroid hormone metabolism, as adipose tissue has been shown to alter thyroid function through leptin-mediated pathways.[18]

The pathophysiology of subclinical hypothyroidism and irregular uterine bleeding is complex, including numerous endocrine and metabolic connections. Thyroid hormones are required for the hypothalamic-pituitary-ovarian axis to operate properly, and even modest thyroid disease can interfere with gonadotropin secretion and ovulatory cycles. Furthermore, SCH has been linked to elevated prolactin levels, which may exacerbate ovulatory dysfunction and monthly abnormalities.[12,19] A recent study suggests that thyroid dysfunction may impair endometrial receptivity and vascular control, contributing to abnormal bleeding patterns.[20]

From a medical point of view this study's comparatively high SCH prevalence emphasizes the significance of routine thyroid function testing for women who present with AUB. Thyroid hormone replacement therapy has been demonstrated to enhance menstrual regularity and lessen irregular bleeding in affected women, and early identification of SCH may enable prompt intervention with this treatment.[21] Additionally, detecting SCH can enhance overall medical care and prevent needless invasive diagnostic procedures.

This study has many limitations that must be addressed when evaluating the results. First, the cross-sectional design makes it difficult to demonstrate a causal link between subclinical hypothyroidism and irregular uterine bleeding since temporal relationships cannot be ascertained. Second, the study was carried out at a single hospital, which may restrict the generalizability of the findings to other groups with varied demographic and environmental variables. Third, potential confounding factors such as dietary iodine consumption, socioeconomic status, stress levels, and thorough reproductive hormone profiles were not considered, which could affect thyroid function and menstruation patterns. Furthermore, structural causes of AUB were ruled out based on available clinical and imaging data; nevertheless, subclinical or undiscovered diseases cannot be completely eliminated. The study also did not examine thyroid autoantibodies, which could shed light on the underlying cause of subclinical hypothyroidism. Finally, while the sample size is appropriate for assessing prevalence, it may reduce the power of subgroup analysis and the identification of weaker associations.

5- CONCLUSION

In summary, subclinical hypothyroidism is relatively common among women who present with abnormal uterine bleeding, with a prevalence of 18.3% in the current study. The most common clinical presentation was menorrhagia, which had a significant association with subclinical hypothyroidism. Age more than 30 years was found to be a significant predictor, although body mass index showed no trend. These findings emphasize the importance of thyroid dysfunction, especially in its subclinical form, in the development of menstrual irregularities. Early detection of subclinical hypothyroidism may result in better clinical care and reproductive health outcomes. Future research should include large-scale, multicenter prospective studies to confirm these findings and assess the effect of thyroid hormone replacement treatment on menstrual outcomes. Additional studies exploring the role of thyroid autoimmunity, reproductive hormones, and metabolic variables in the pathogenesis of AUB is needed to further understand the underlying mechanisms.

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Conflict of intertest

About this study, the authors disclose no conflicts of interest.

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