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THYROID DYSFUNCTION IN PATIENTS OF REPRODUCTIVE AGE GROUP PRESENTING WITH ABNORMAL UTERINE BLEEDING

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Abstract

Background: *Abnormal uterine bleeding (AUB) significantly affects women's health, with thyroid dysfunction being a potential underlying cause. However, controversy exists regarding its frequency in AUB. This study aimed to clarify the prevalence of thyroid dysfunction in such cases.*

Objective: *To determine the frequency of thyroid dysfunction in patients of reproductive age group presenting with AUB.*

Duration: *Three months w.e.f 16-10-2024 to 15-03-2025*

Methodology: *After receiving approval from the Ethical Committee of Ghurki Trust Teaching Hospital, 151 women of reproductive age presenting with AUB were enrolled from the outpatient ward. Informed written consent was taken, and participants underwent a demographic examination and thyroid profile tests (T3, T4, TSH). Data was collected using a predesigned questionnaire and analyzed using SPSS version 26.0.*

Results: *The study included 151 participants with a mean age of 31.15±7.71 years and mean BMI of 26.57±3.55 kg/m². Participants were categorized by age, parity, and types AUB. Thyroid dysfunction was present in 31.1% of participants. Stratification showed no significant differences in thyroid dysfunction across age, parity, BMI or AUB types.*

Conclusion: *In conclusion, thyroid dysfunction was present in 31.1% of participants with abnormal uterine bleeding. Despite no significant differences in stratification, this highlights the importance of routine thyroid screening in this population.*

INTRODUCTION

Thyroid hormones play a crucial role in regulating reproductive biology, influencing menstrual cycles and overall reproductive health. AUB is a prevalent condition in gynecology outpatient departments, with thyroid dysfunction being a known factor in its progression.[1] While AUB is not life-threatening yet it can lead to significant social, psychological, and occupational disruptions. Defined as any bleeding that deviates from the normal volume, frequency, duration, or periodicity, AUB includes conditions such as menorrhagia (excessive bleeding), oligomenorrhea (infrequent periods), and polymenorrhea (frequent periods).[2,3] Common symptoms reported by women with AUB include prolonged bleeding, fatigue, passage of clots, and pain. These symptoms can severely impact a woman's health-related quality of life (HRQL), with excessive blood loss contributing to physical and emotional

distress. AUB affects approximately 9-14% of women between menarche and menopause.[4]

Evidence shows that thyroid dysfunction produces adverse effects on the hypothalamic-pituitary-ovarian axis which results in reproductive abnormalities e.g. delayed puberty and premature menopause and AUB and infertility.[5] Thyroid disorders are more prevalent in women than in men, with autoimmune causes being a significant contributor.[6] The menstrual patterns of women with AUB are affected by thyroid function disorders such as hypothyroidism and hyperthyroidism.[7] Ovarian dysfunction, often associated with hormonal imbalances, is the most common underlying pathology of AUB.[8] Therefore assessment of thyroid dysfunction among AUB patients represents a logical approach to diagnosing proper treatment and enhancing patient outcomes in women's reproductive health. .[9]

Chaudhary et al. (2022)[10] in Pakistan reported frequency of thyroid dysfunction in patients of reproductive age group presenting with AUB to be 28.12%. Sahu et al. (2021)[11] in India reported frequency of thyroid dysfunction in patients of reproductive age group presenting with AUB to be 20.0%. However, Shawl et al. (2020)[12] in India reported it only 11%.

The frequency of thyroid dysfunction in reproductive-age women with AUB remains controversial, with studies reporting varying rates from 11% to 28.12%. Given Pakistan's limited resources, it is important to allocate funds wisely, especially when prevalence figures differ significantly. This study aims to clarify these discrepancies. Early detection and management of thyroid dysfunction in AUB patients can prevent unnecessary surgeries, reduce financial strain, and enhance quality of life, offering better outcomes for women with AUB.

METHODOLOGY

This descriptive cross-sectional study was conducted at the Department of Obstetrics & Gynaecology, Ghurki Trust Teaching Hospital, Lahore, with the aim to determine the frequency of thyroid dysfunction in reproductive-age women presenting with abnormal uterine bleeding (AUB). The study's duration was five months following the approval of the synopsis. A sample size of 151 cases was calculated using a 95% confidence level and a 5% margin of error, with an expected frequency of thyroid dysfunction among this population estimated at 11%.[12] Non-probability consecutive sampling was used to select participants, who were women aged 18 to 45 years, diagnosed with AUB as per operational definitions. Abnormal uterine bleeding was categorized into polymenorrhea (bleeding at intervals of less than 21 days), oligomenorrhea (bleeding at intervals of more than 35 days), menorrhagia (heavy blood flow greater than 80ml per cycle), metrorrhagia (inter-menstrual irregular bleeding), and amenorrhea (absence of menstrual bleeding in non-menopausal women). Thyroid dysfunction was defined based on serum levels of T3, T4, and TSH. Dysfunction was labeled if any value of TSH (0.5-4.7 mU/L), T3 (0.92-2.78 nmol/L), or T4 (58-140 nmol/L) fell outside the reference range. The inclusion criteria were female patients aged 18 to 45 years suffering from AUB, while those excluded included women using intrauterine contraceptive devices (IUCDs), on hormonal preparations (e.g., oral contraceptives), receiving thyroid replacement therapy, or having conditions such as pelvic pathology (fibroids, polyps, cervical growths), genital malignancy, pelvic inflammatory disease, or polycystic ovarian disease (PCOD), or taking medications like steroids, anticoagulants, antithyroid drugs, and cytotoxic agents. Following ethical approval, 151 eligible patients were enrolled after obtaining informed consent. Each participant underwent a detailed demographic examination and a thyroid profile (serum T3, T4, and TSH levels). All the patients were given treatment as standard protocol of the hospital. Data were collected using a pre-designed questionnaire and analyzed using SPSS version 26.0. Numerical variables (age, BMI, serum T3, T4 levels) were presented as mean ± SD, while categorical variables (parity, type of AUB, thyroid dysfunction) were presented as frequency and percentages. Chi-square tests were used to compare the frequency of thyroid dysfunction across subgroups of age, parity, BMI and type of AUB, with a p-value ≤0.05 considered statistically significant.

RESULTS

The study included 151 participants with an average age of 31.15±7.71 years. The age distribution was as follows: 70 participants (46.4%) were between 18 and

30 years old, while 81 participants (53.6%) were between 31 and 45 years old. The mean BMI of the study population was 26.57±3.55 kg/m², with 34.4% classified as having normal weight and 65.6% falling into the overweight or obese category. Regarding parity, 56 participants (37.1%) were nulliparous, 52 participants (34.4%) were primiparous, and 43 participants (28.5%) were multiparous. The types of abnormal uterine bleeding (AUB) observed included polymenorrhea in 22 participants (14.6%), oligomenorrhea in 52 parti (34.4%), menorrhagia in 41 participants (27.2%), metrorrhagia in 16 participants (10.6%), and amenorrhea in 20 participants (13.2%). The thyroid function tests showed a mean TSH level of 3.56±1.53 mU/L, a mean T3 level of 2.27±0.81 mU/L, and a mean T4 level of 111.87±32.51 mU/L. Data is given in Table 1.0. Thyroid dysfunction was present in 47 participants, accounting for 31.1% of the total sample, while 104 participants (68.9%) did not have thyroid dysfunction as given in Table 2.0. Table 3.0 compares thyroid dysfunction across various subgroups of women with preeclampsia. The p-values indicate no statistically significant differences in thyroid dysfunction across age, parity, or AUB types.

Table 1.0: Demographic & Baseline Characteristics of Study Cohort

Characteristics	Participants n=151
Age (years)	31.15±7.71
• 18-30 years	70 (46.4%)
• 31-45 years	81 (53.6%)
BMI (Kg/m2)	26.57±3.55
• Normal Weight	52 (34.4%)
• Overweight/Obese	99 (65.6%)
Parity	
• Nulliparous	56 (37.1%)
• Primiparous	52 (34.4%)
• Multiparous	43 (28.5%)
Type of AUB	
• Polymenorrhea	22 (14.6%)
• Oligomenorrhea	52 (34.4%)
• Menorrhagia	41 (27.2%)
• Metorrhagia	16 (10.6%)
• Amenorrhea	20 (13.2%)
TSH (mU/L)	3.56±1.53
T3 (mU/L)	2.27±0.81
T4 (mU/L)	111.87±32.51

Table 2.0: Frequency of Thyroid Dysfunction in Women Presenting with AUB

Thyroid Dysfunction	Frequency (n)	Percent (%)
Yes	**47**	**31.1 %**
No	**104**	**68.9 %**
Total	**151**	**100.0 %**

Table 3.0 Comparison of Thyroid Dysfunction across various Subgroups of Women with AUB

Subgroups	n	Thyroid Dysfunction n (%)	P-value
Age (years)			
• **18-30 years**	70	25 (35.7%)	0.580
• **31-45 years**	81	22 (27.2%)	
BMI (kg/m^2)			
• Normal Weight	52	14 (26.9%)	0.419
• Overweight/Obese	99	33 (33.3%)	
Parity			
• **Nulliparous**	56	18 (32.1%)	0.691
• **Primiparous**	52	14 (26.9%)	
• **Multiparous**	43	15 (34.9%)	
Type of AUB			
• **Polymenorrhea**	22	7 (31.8%)	0.970
• **Oligomenorrhea**	52	16 (30.8%)	
• **Menorrhagia**	41	14 (34.1%)	
• **Metorrhagia**	16	5 (31.3%)	
• **Amenorrhea**	20	5 (25.0%)	

Chi-square test.

DISCUSSION

Abnormal uterine bleeding (AUB) is a common condition in women of reproductive age, which can have significant consequences on their health and quality of life, including anemia, fertility issues, and emotional distress.[2,13] One probable underlying factor for AUB is thyroid dysfunction, as thyroid hormones play a crucial role in regulating menstrual cycles.[14,15] However, there is controversy in existing literature regarding frequency of thyroid dysfunction in women with AUB.[10,11,12] To address gap in existing literature, determine the prevalence of thyroid dysfunction in women with AUB and establish a clearer understanding of the relationship between the two this study was conducted in local settings.

In this study, the mean age of women with AUB was 31.15±7.71 years. Previously, Farrukh et al.[16] reported a mean age of 36.25±5.89 years, Irshad et al.[17] reported 33.72±7.62 years, Habib et al.[18] reported 32.5±7.4 years, and Gulzar et al.[19] reported 46.8±5.98 years. Additionally, in a study conducted by Chaudhary et al.,[10] 23.75% of participants were in the 13-25 years age group, 71.87% were in the 26-38 years age group, and 4.38% were in the 39-50 years age group. The observed variations in age reflect differences in the inclusion criteria across these studies.

The mean BMI of the study population was 26.57±3.55 kg/m^2, with 34.4% classified as having normal weight and 65.6% falling into the overweight or obese category. Previopusly, mean BMI of the participant in a similar studies was reported as 26.78±4.13 kg/m^2 and 27.98+6.21 kg/m^2 by Irshad et al. and Gulzar et al., respectively.[17,19] Regarding parity, 56 participants (37.1%) were nulliparous, 52 participants (34.4%) were primiparous, and 43 participants (28.5%) were multiparous in this study. Sahu et al. reported 35.4% women with AUB as nulliparous, 15.0% primiparous and 49.6% multiparous.[11] Shawl et al. reported it 17%, 7%, 14% 37%, 20% and 5% as unmarried, nullipara, para 1, para 2, para 3 and para 4 or more, respectively.[12]

The types of AUB in this study included polymenorrhea in 22 participants (14.6%), oligomenorrhea in 52 participants (34.4%), menorrhagia in 41 participants (27.2%), metrorrhagia in 16 participants (10.6%), and amenorrhea in 20 participants (13.2%). Chaudhary et al.[10] reported it as polymenorrhea (7.86%), oligomenorrhea (25.0%), menorrhagia (42.14%), Metorrhagia (10.0%) and amenorrhea (10.0%) whereas Irshad et al.[17] reported it as amenorrhea (13.3%), hypomenorrhea (1.3%),

oligomenorrhea (10.7%), metorrhagia (7.3%), menorrhagia (51.3%) and polymenorrhea (16.0%).

In this study, the thyroid function tests showed a mean TSH level of 3.56±1.53 mU/L, a mean T3 level of 2.27±0.81 mU/L, and a mean T4 level of 111.87±32.51 mU/L. Previously, mean values for TSH, T3 and T4 levels were reported by Gulzar et al. as 4.5±2.4 mU/L, 3.4±1.7 pmol/L and 1.8±0.6 pmol/L respectively.[19]

Thyroid dysfunction was observed in 47 participants, accounting for 31.1% of the total sample. Our findings closely align with the 28.12% prevalence of thyroid dysfunction in women with AUB reported by Chaudhary et al.[10] However, Irshad et al.[17] reported a higher frequency of 38.0%. In contrast, other studies reported lower rates, with Sahu et al.[11] finding 20.0%, Habib et al.[18] reporting 21.9%, Thakur et al.[20] at 15.1%, and Shawl et al.[12] at 11.0%.

CONCLUSION

Thyroid dysfunction was observed in 31.1% of women with AUB. Stratification of data across age, parity, and AUB types showed no significant differences. This highlights the need for routine thyroid screening in women with abnormal uterine bleeding, irrespective of demographic factors.

LIMITATIONS & RECOMMENDATIONS

Strengths of this study include its focused exploration of thyroid dysfunction in women with AUB, contributing to the limited local data and offering insights into the relationship between the two conditions. Limitations include the relatively small sample size and potential biases in participant selection. Future prospects include expanding the study to larger, more diverse populations, conducting longitudinal research to establish causality, and investigating the role of thyroid dysfunction in different subtypes of AUB to further clarify its clinical implications.

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Authors Contribution

Author 1

Substantial contributions to study design, acquisition of data
Analysis & Interpretation of Data, Manuscript writing
Has given final approval of the version to be published
Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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