Original Article
DOI: https://doi.org/10.70749/ijbr.v3i3.836

INDUS JOURNAL OF BIOSCIENCE RESEARCH
https://induspublishers.com/IJBR
ISSN: 2960-2793/ 2960-2807

Thyroid Dysfunction and Its Relationship with Abnormal Uterine Bleeding in Females

Asawir Adan Mustafa[1], Abdul Ali Khan[2], Muhammad Adil Abid[3], Mahnoor Shoukat[4], Atiqa Noor[5], Maryam Khalid[6], Sadaf Khan[4]

[1]Riphah International University, Islamabad, Pakistan
[2]University of New Mexico, United States
[3]Northwest Institute of Health Sciences, Peshawar, Pakistan
[4]Nishtar Medical University, Multan, Pakistan
[5]King Edward Medical University, Lahore, Pakistan
[6]Isra University, Islamabad, Pakistan

ARTICLE INFO

Keywords

Thyroid Profile, AUB, Thyroid dysfunction, Menstrual Disturbances.

Corresponding Author: Sadaf Khan, Nishtar Medical University, Multan, Pakistan

Email: sadafkhan@gmail.com

Declaration

Authors' Contribution: All authors equally contributed to the study and approved the final manuscript.

Conflict of Interest: No conflict of interest.

Funding: No funding received by the authors.

Article History

Received: 10-01-2025, Revised: 27-02-2025
Accepted: 13-03-2025, Published: 21-03-2025

ABSTRACT

Background: Abnormal uterine bleeding is regarded as a serious and complicated issue. Thyroid hormones play significant role in the reproductive function of women. Both Hypothyroidism and hyperthyroidism may result in menstrual disturbances. **Objective:** Present study was conducted to assess the prevalence of thyroid disorders in dysfunctional uterine bleeding patients. **Methodology:** Hospital based Cross sectional study is conducted in Gynecology Department of different hospitals and clinics of Rawalpindi and Islamabad. Study period is 4 months after the approval of the research board. 200 patients were analyzed for the entire duration of 4 months (from September 2024 to December 2024) of research. Simple Random Sampling technique was used, and analyzed using SPSS version 25. **Results:** Most of the AUB cases were in the age group of 25-29 years, (26%). Thyroid disorders were prevalent in 33% of the women studied. Hypothyroidism was present in 26% and Hyperthyroidism in 6.7% of the women with AUB. The most common menstrual pattern was oligomenorrhea which was present in 62.8 % of the AUB cases. Pelvic ultrasound (USG) revealed on-structural causes were the most common (48.5%) while structural causes were the least common (7.1%). **Conclusion:** Thyroid dysfunction is associated with menstrual disturbances (abnormal uterine bleeding). Prevalence of hypothyroidism was more common than hyperthyroidism in AUB cases. Thyroid function tests should be performed in all patients with menstrual irregularities (AUB) to avoid unnecessary interventions.

INTRODUCTION

Abnormal uterine bleeding (AUB) is a significant gynecological concern that encompasses a wide spectrum of menstrual irregularities, including deviations in frequency, duration, volume, and cyclicity of menstrual bleeding. Normal menstrual parameters, as defined by the International Federation of Gynecology and Obstetrics (FIGO), include a cycle frequency of 24–38 days, regularity variations within 20 days over 12 months, a duration of 4.5–8 days, and a blood loss volume of 5–80 mL. Any deviation from these parameters is classified as AUB, which accounts for approximately one-third of all outpatient gynecological visits. Recognized as both a clinical and public health challenge, AUB significantly impacts the physical, emotional, and social well-being of affected individuals. In 2009, the FIGO Menstrual Disorders Group redefined AUB as "bleeding from the uterine corpus that is abnormal in volume, regularity, and/or timing and has been present for the majority of the last six months." To standardize the classification of AUB causes, FIGO introduced the PALM-COEIN system in 2011. This framework categorizes AUB into structural causes (Polyps [P], Adenomyosis [A], Leiomyoma [L], Malignancy and hyperplasia [M]) and non-structural causes (Coagulopathy [C], Ovulatory dysfunction [O], Endometrial dysfunction [E], Iatrogenic [I], and Not yet classified [N]).

AUB can manifest in various forms such as menorrhagia (heavy menstrual bleeding), metrorrhagia (irregular bleeding), polymenorrhea (frequent bleeding), or oligomenorrhea (infrequent bleeding). Chronic AUB refers to persistent abnormal bleeding over six months, while acute AUB involves heavy bleeding requiring immediate medical intervention. The condition can lead

to severe anemia and other complications, necessitating timely diagnosis and management.

The prevalence of AUB varies globally but is estimated to affect 10–30% of women in their reproductive years, with higher rates observed in those over 35 years. Despite its widespread occurrence, the etiology of AUB is complex and multifactorial, involving structural abnormalities, hormonal imbalances, systemic conditions, or iatrogenic factors. Effective management strategies range from medical therapies such as hormonal treatments to surgical interventions like hysteroscopy or hysterectomy.

This research paper aims to explore the etiology, clinical presentation, diagnostic approaches, and management options for AUB. By delving into the FIGO classification system and examining both structural and non-structural causes, this study seeks to contribute to a better understanding of AUB and its impact on women's health.

METHODOLOGY

The study was designed as a cross-sectional investigation to explore the association between thyroid dysfunction and abnormal uterine bleeding (AUB). The research was conducted in the gynecology departments of various hospitals and clinics in Rawalpindi and Islamabad over a four-month period following approval from the research board.

The inclusion criteria for the study encompassed women of reproductive age (17–52 years), both married and unmarried, with structural or non-structural uterine abnormalities or significant endocrine disorders, such as polycystic ovarian syndrome (PCOS), Cushing syndrome, or uncontrolled diabetes. Pregnant and lactating women, as well as those who had used hormonal contraceptives or hormone-modulating treatments within the last three months, were excluded.

A total of 196 patients were analyzed during the study period, with blood samples collected for thyroid profile testing. The sample size was calculated using the Open Epi tool, and purposive sampling was employed to select participants.

Data Collection

Data collection involved accessing medical records while adhering to strict confidentiality protocols. Records were screened for inclusion criteria, focusing on females diagnosed with AUB. Relevant information, including patient demographics, diagnosis, treatment history, thyroid profiles, hormonal profiles, and ultrasound reports, was extracted to ensure comprehensive evaluation.

Blood samples were collected using standard phlebotomy procedures for thyroid profile testing (T3, T4, TSH). Venous blood was drawn into serum separating tubes (SST), and proper hygiene and safety protocols were followed throughout the process. Samples were transported to the laboratory under appropriate conditions, centrifuged to separate serum, and analyzed using the ELISA method. Controls and calibrators were used to ensure result accuracy. Results were compared against reference ranges to identify hypothyroidism or hyperthyroidism and interpreted in conjunction with clinical history and symptoms.

Data analysis was performed using SPSS version 25. Frequencies and percentages were calculated for categorical variables, while Chi-square tests were applied to determine associations between thyroid dysfunction and AUB. The results were presented in tables, bar graphs, and pie charts generated using MS Excel, MS Word, and SPSS.

RESULTS

The minimum age of the patient included in the study was 15 years and maximum age of the patient was 49 years with the maximum number of female patients belonging to the age group 25-29 years, N=51cases (26.0%),whereas N=29(14.8%) patients were from 20-24 years of age, N=35(17.9%) patients were from 30-34 years of age, N=29(14.8%) patients were from 35-39 years of age, N=20(10.2%) patients were from 40-44 years of age, N=4(2.0%) patients were from 45-49 years of age with the least prevalent cases.

Pelvic ultrasound (USG) revealed normal findings in N=196 cases (44.3%). Among the causes of abnormal uterine bleeding (AUB), non-structural causes were the most identified in N=95 patients (48.5%) while structural causes were the least common, observed in only N=14 patients (7.1%).

The bleeding pattern of the menstruation in AUB females was also asked and recorded in the questionnaire and was also analyzed statistically. The highest female population with AUB was with the complaint of oligomenorrhea (123/196), followed by menorrhagia (14/196), polymenorrhea (54/196) with the least complaint of amenorrhea (5/196). Oligomenorrhea and polymenorrhea were the common and most prevalent clinical outcomes of the AUB in gyne patients.

In our prevalent study, the prevalence of thyroid dysfunction in AUB was 67% and Euthyroid was 33%. The prevalence of hypothyroidism was N=51(26.2%), N=13 (6.7%) was hyperthyroid. The most common thyroid dysfunction among the study group was noted to be hypothyroidism (26.2%).

Thyroid disorders were prevalent in 32.6% of AUB patients. The prevalence of Hypothyroidism was 26% and Hyperthyroidism was 6.6% among the AUB patients as assessed by the findings of their thyroid function tests.

Age wise distribution of Hypothyroidism and Hyperthyroidism cases among AUB patients showed that though thyroid dysfunction is seen in all age groups, it is most common in 35 – 39 yrs (31.2%) with hypothyroidism in (35%) and hyperthyroidism (15.3%)

of the AUB cases. Among the 20-24 year' age group, (7%) had hypothyroidism while none had hyperthyroidism. Among the 40-45 year' age group (11%) had hypothyroidism while none had hyperthyroidism. And the 40-49 years' age group (1.9%) had hypothyroidism while none had hyperthyroidism. Among the 15 -19 years' age group (3%) had hypothyroidism while (7.6%) had hyperthyroidism. Among the 25-29 years' age group (13%) had hypothyroidism while (53%) had hyperthyroidism. Association of thyroidism was compared with different age groups of females it-was evident from the results that significantly highest ($p<0.01$).

The commonest menstrual complaint was oligomenorrhoea (70.3%) oligomenorrhoea has been found to be one of the early manifestations of sub-clinical hyperthyroidism becomes symptomatic latter. Hypothyroid patients had at least one of the following menstruation irregularities oligomenorrhoea (84.3%) by polymenorrhoea (1.9%.) menorrhagia (7.8%) amenorrhea (1.9%) while hyperthyroid patients had oligomenorrhoea (15.3%) polymenorrhoea (61.5%.) Menorrhagia (23%) except for amenorrhea which is (0. 0%). The association of thyroidism was compared with Menstrual patterns it-was highly significant ($p<0.01$).

Table 1

Age-wise Distribution of Patients

Age	Number of Patients	Percentage (%)
15-19	28	14.3
20-24	29	14.8
25-29	52	26.0
30-34	35	17.9
35-39	29	14.8
40-44	20	10.2
45-49	4	2.0
Total	196	100.0

Table 2

Causes of AUB

Causes of AUB	Number of Patients	Percentage (%)
Structural	14	7.1
Non-structural	95	48.5
Normal	87	44.4
Total	196	100.0

Table 3

Table of Types of AUB

Types of AUB	Number of Patients	Percentage (%)
Oligomenorrhea	123	62.8
Polymenorrhea	54	27.6
Menorragia	14	7.1
Amenorrhea	5	2.6
Total	196	100.0

Table 4

Age-wise Distribution of Hyperthyroid and Hypothyroidism Cases in Females

Age	Hypothyroidism	Hyperthyroidism	Hypothyroidism Hyperthyroidism	Euthyroid	Total	P -value
15-19	2 (3%)	1 (7.6%)	3 (4.6%)	25 (18.9%)	28 (14.2%)	<0.01
20-24	4 (7%)	0	4 (6.2%)	25 (18.9%)	29 (14.7%)	
25-29	7 (13%)	7 (53%)	14 (21%)	37 (28%)	51 (26%)	
30-34	13 (25%)	3 (23%)	16 (25%)	19 (14.3%)	35 (17.8%)	
35-39	18 (35%)	2 (15.3%)	20 (31.2%)	9 (6%)	29 (14.7%)	
40-44	6 (11%)	0	6 (9.3%)	14 (10.6%)	20 (10.2%)	
45-49	1 (1.9%)	0	1 (1.5%)	3 (2.2%)	4 (2%)	
Total (n=196)	51 (26%)	13 (6.6%)	64 (32.6%)	132 (67.3%)	196 (100%)	

Table 5

Bleeding Patterns in Hypothyroid and Hyperthyroid Cases

Menstrual Irregularities	Hypothyroidism (n=51)	Hyperthyroidism (n=13)	Total (n=64)	P- value
Oligomenorrhea	43 (84.3%)	2 (15.3%)	45 (70.3%)	<0.01
Polymenorrhea	3 (1.9%)	8(61.5%)	11 (17%)	
Menorrhagia	4 (7.8%)	3 (23%)	7 (10%)	
Amenorrhea	1 (1.9%)	0	1 (1.5%)	

DISCUSSION

Abnormal uterine bleeding (AUB) refers to bleeding that deviates from the normal range in terms of amount, frequency, duration, or cyclicity. Accounting for one-third of all outpatient gynecological visits, AUB is a complex issue often linked to endocrine disturbances, with thyroid dysfunction being a major contributor to ovulatory problems. Thyroid dysfunction affects 9–14% of women during their reproductive years and can disrupt menstrual cycles through its impact on ovarian function, sex hormone binding globulin (SHBG), gonadotropin-releasing hormones (GnRH), and coagulation factors.

This study analyzed 196 patients with AUB attending gynecological clinics. The highest prevalence was observed in the 25–29 age group (26%), followed by the 30–34 age group (17.9%). Thyroid dysfunction was found in 32% of AUB patients, with hypothyroidism being more common (26%) than hyperthyroidism

(6.6%). These findings align with studies by Dr. Nasrin Chowdhury but differ from Bishal Raj Joshi's research, which reported a lower prevalence of thyroid dysfunction (15.79%). Age-wise distribution showed thyroid dysfunction was most prevalent among patients aged 35–39 years.

Menstrual patterns revealed oligomenorrhea as the most common bleeding pattern (62.8%), followed by polymenorrhea (27.6%), menorrhagia (7.1%), and amenorrhea (2.5%). Hypothyroid patients primarily experienced oligomenorrhea (21.9%), consistent with Dhanusha Nekkanti's findings, while hyperthyroid patients commonly presented polymenorrhea (4.1%). Structural causes accounted for 7.1% of AUB cases, while non-structural causes were more prevalent at 48.5%.

CONCLUSION

The significant association between thyroid dysfunction and abnormal uterine bleeding (AUB) is highlighted in this study. Women across various age groups show an impact from this gynecological issue. These findings underscore the high prevalence of thyroid dysfunction (32%) in AUB patient with hypothyroidism 25.9% being more common than hyperthyroidism 6.6%. In our study thyroid disorders, particularly in the age group 35–39-year N=20(31.2%), play a pivotal role in abnormal menstrual patterns, most notably causing oligomenorrhea in hypothyroid patients and polymenorrhea in hyperthyroid patients. The study further emphasizes that the majority of AUB cases N=95(48.5%), accounts for non-structural causes.

Limitations

Prioritizing women's health, future research should focus on: 1) Qualitative studies to understand the lived experiences of women with AUB and thyroid dysfunction. 2) Multicenter studies to ensure findings are generalizable across diverse populations. 3) Exploring the impact of lifestyle factors (obesity, diet, stress, physical activity) on the AUB-thyroid dysfunction link. 4) Investigating biomarkers (TPO-Ab, TSI) to clarify their relationship with AUB patterns. Ultimately, improving thyroid management can reduce menstrual irregularities and enhance quality of life, highlighting the need for routine thyroid screening in women with AUB.

REFERENCES

1. Menon S, College GM. International Journal of Scientific Research Prevalence of Thyroid Abnormality in Perimenopausal Women Obstetrics & Gynaecology. 2023;(2277):12– 4. https://doi.org/10.36106/ijsr/6006818
2. Choudhury SA, Nath P. Abnormal uterine bleeding; its prevalence, causes and management in a tertiary care hospital. New Indian J OBGYN. 2020;7(1):52–7. https://doi.org/10.21276/obgyn.2020.7.11
3. Whitaker L, Critchley HOD. Abnormal uterine bleeding. Best Pract Res Clin Obstet Gynaecol [Internet]. 2016;34:54–65. Available from: http://doi.org/10.1016/j.bpobgyn.2015.11.012
4. Sabre A, Serventi L, Nuritdinova D, Schiattarella A, Sisti G. Abnormal uterine bleeding types according to the palm-coein figo classification in a medically underserved american community. J Turkish Ger Gynecol Assoc. 2021;22(2):91–6. https://doi.org/10.4274/jtgga.galenos.2021.2020.0228
5. Jain V, Chodankar RR, Maybin JA, Critchley HOD. Uterine bleeding: how understanding endometrial physiology underpins menstrual health. Nat Rev Endocrinol. 2022;18(5):290–308. https://doi.org/10.1038/s41574-021-00629-4
6. Sahu HD, Varma A V, Karmarkar S, Malukani K, Khanuja A, Kesharwani P. Endometrial Histopathology in Abnormal Uterine Bleeding and Its Relation with Thyroid Profile and Endometrial Thickness. Cureus. 2023;15(4):12–8. https://doi.org/10.7759/cureus.37931
7. V. S, Gopalan U. Clinical pattern and presentation of abnormal uterine bleeding. Int J Reprod Contraception, Obstet Gynecol. 2019;9(1):126. https://doi.org/10.18203/2320-1770.ijrcog20195587
8. Munro MG, Critchley HOD, Broder MS, Fraser IS. FIGO classification system (PALM-COEIN) for causes of abnormal uterine bleeding in nongravid women of reproductive age. Int J Gynecol Obstet. 2011;113(1):3–13. https://doi.org/10.1016/j.ijgo.2010.11.011
9. Leal CRV, Vannuccini S, Jain V, Dolmans M-M, Di Spiezio Sardo A, Al- Hendy A, et al. Abnormal uterine bleeding: The well-known and the hidden face. J Endometr Uterine Disord. 2024;6(April):100071. https://doi.org/10.1016/j.jeud.2024.100071
10. Kitahara Y, Hiraike O, Ishikawa H, Kugu K, Takai Y, Yoshino O, et al. National survey of abnormal uterine bleeding according to the FIGO classification in Japan. J Obstet Gynaecol Res. 2023;49(1):321–30. https://doi.org/10.1111/jog.15464
11. Viganò S, Smedile A, Cazzella C, Marra P, Bonaffini PA, Sironi S. Abnormal Uterine

Bleeding: A Pictorial Review on Differential Diagnosis and Not-So- Common Cases of Interventional Radiology Management. Diagnostics. 2024;14(8). https://doi.org/10.3390/diagnostics14080798
12. Yuksel S, Tuna G, Celik HG, Salman S. Endometrial polyps: Is the prediction of spontaneous regression possible? Obstet Gynecol Sci. 2021;64(1):114–21. https://doi.org/10.5468/ogs.20242
13. MacGregor B, Munro MG, Lumsden MA. Therapeutic options for the management of abnormal uterine bleeding. Int J Gynecol Obstet. 2023;162(S2):43–57. https://doi.org/10.1002/ijgo.14947
14. Lonky NM, Chiu V, Portugal C, Estrada EL, Chang J, Fischer H, et al. Adenomyosis in women undergoing hysterectomy for abnormal uterine bleeding associated with uterine leiomyomas. PLoS One [Internet]. 2023;18(12 December):1–14. http://doi.org/10.1371/journal.pone.0294925
15. Zhang HL, Zhu JE, Deng EY, Li JX, Sun LP, Peng CZ, et al. Ultrasound- guided percutaneous microwave ablation for adenomyosis with abnormal uterine bleeding: clinical outcome and associated factors. Int J Hyperth. https://doi.org/10.1080/02656736.2023.2249274