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Menstrual Bleeding Patterns in Women with Thyroid Dysfunction and Abnormal Uterine Bleeding at a Tertiary Care Hospital in Bangladesh

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Abstract

Background: Thyroid dysfunction can disturb ovulation and endometrial bleeding, yet local data on menstrual bleeding patterns among women with abnormal uterine bleeding (AUB) remain limited. ***Objective:*** To evaluate menstrual bleeding patterns among women with thyroid dysfunction presenting with AUB at a tertiary care hospital in Bangladesh. ***Methods:*** This hospital-based observational cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, from October 2015 to March 2016. Fifty women presenting with AUB were included through consecutive sampling. All participants underwent clinical evaluation and thyroid function testing and were classified as euthyroid, hypothyroid or hyperthyroid. Data were analysed using SPSS version 16.0. ***Results:*** The mean age of the participants was 34.57 ± 9.27 years, and 52.0% were aged 36–45 years. Most participants were urban residents (58.0%) and housewives (56.0%). Thyroid dysfunction was present in 13 women (26.0%), including hypothyroidism in 9 (18.0%) and hyperthyroidism in 4 (8.0%), while 37 (74.0%) were euthyroid. Among women with thyroid dysfunction, menorrhagia was the most common bleeding pattern (61.53%), followed by polymenorrhoea (23.07%), polymenorrhagia (7.69%) and oligomenorrhoea (7.69%). Menorrhagia was observed in 66.7% of hypothyroid women, whereas menorrhagia and polymenorrhoea each accounted for 50.0% of hyperthyroid women. Abdominal pain (76.0%) and nausea or vomiting (68.0%) were the most common associated symptoms. ***Conclusion:*** Thyroid dysfunction was present in approximately one-fourth of women presenting with AUB, with hypothyroidism being more common than hyperthyroidism. Menorrhagia was the predominant bleeding pattern among women with thyroid dysfunction. Thyroid function assessment may be considered as part of the evaluation of women presenting with AUB.

Keywords: Abnormal uterine bleeding; thyroid dysfunction; hypothyroidism; hyperthyroidism; menorrhagia; menstrual bleeding patterns; Bangladesh.

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INTRODUCTION

Abnormal uterine bleeding (AUB) is a prevalent gynecological disorder among women of reproductive age and can considerably impair their quality of life.[1] It is characterized by changes in menstrual blood volume, cycle regularity, and timing, affecting approximately 20–35% of women worldwide.[2] The exact etiology of dysfunctional uterine bleeding remains unclear; however, it is frequently associated with anovulation and the resulting hormonal imbalance. Ovarian dysfunction may arise from intrinsic ovarian abnormalities or lesions, or may occur secondary to disturbances in other endocrine organs, particularly the hypothalamus, pituitary gland, and thyroid. [3,4,5] A surge in luteinizing hormone (LH)

triggers ovulation, after which the corpus luteum secretes progesterone, promoting the development of a secretory endometrium. If pregnancy does not occur, estrogen and progesterone levels decrease, leading to withdrawal bleeding approximately 13–15 days after ovulation.[6] Any disturbance in normal reproductive physiology or structural changes in the endometrium may contribute to abnormal uterine bleeding. Additionally, genital bleeding in childhood, uterine bleeding requiring emergency management, and postmenopausal bleeding are considered abnormal.

AUB is believed to be more common in low- and middle-income countries because of limited access to diagnostic facilities and specialized healthcare services.[7] The International Federation of Gynecology and Obstetrics (FIGO) introduced the PALM–COEIN classification system to establish a standardized approach to identifying the causes of AUB. This system divides the causes into structural categories (polyp, adenomyosis, leiomyoma, and malignancy/hyperplasia) and non-structural categories (coagulopathy, ovulatory dysfunction, endometrial, iatrogenic, and not otherwise classified).[8] Among these, structural abnormalities, particularly leiomyomas and endometrial polyps, are frequently encountered in clinical practice and may necessitate invasive treatment.[9] Several demographic factors, including age, body mass index (BMI), parity, educational status, and place of residence, may influence the clinical presentation and diagnosis of abnormal uterine bleeding (AUB) in tertiary care hospitals.[10] However, recent locally generated evidence regarding the causes of AUB based on the PALM–COEIN classification remains limited in low- and middle-income countries. This lack of data may affect the identification of underlying etiologies, leading to diagnostic challenges, delays in appropriate treatment, and an increased healthcare burden.[11] Therefore, evaluating the common causes of AUB using the PALM–COEIN classification system may help improve diagnostic accuracy, guide appropriate treatment decisions, and enhance the quality of patient care.[12]

In Bangladesh, abnormal uterine bleeding is an important clinical concern, as it can cause anaemia, fatigue, reduced quality of life, and reproductive difficulties. Identifying treatable endocrine abnormalities may improve assessment and guide management, and thyroid evaluation may be particularly relevant in women with unexplained or recurrent AUB. However, thyroid dysfunction does not necessarily cause the bleeding, so thorough gynaecological assessment remains essential. Therefore, this study aims to evaluate the menstrual bleeding patterns among women with thyroid dysfunction presenting with abnormal uterine bleeding (AUB) at a tertiary care hospital in Bangladesh

OBJECTIVES

The main objective was to evaluate the menstrual bleeding patterns among women with thyroid dysfunction presenting with abnormal uterine bleeding (AUB) at a tertiary care hospital in Bangladesh.

METHODOLOGY & MATERIALS

This hospital-based observational cross-sectional study was conducted in the Department of Obstetrics and Gynaecology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Shahbag, Dhaka, Bangladesh, over a period of six months, from 6 October 2015 to 29 March 2016.

Inclusion Criteria

- Women aged 15 years or older presenting with abnormal uterine bleeding.
- Women who provided informed consent to participate in the study.

Exclusion Criteria

- Women receiving hormonal treatment or medications known to interfere with thyroid function.
- Intrauterine contraceptive device (IUCD) users.
- Women with a known history of goitre or thyroid carcinoma.
- Women with overt clinical manifestations of thyroid dysfunction.
- Women with a history of bleeding disorders.

A total of 50 women presenting with AUB were included in the study using a consecutive sampling technique. Data were collected using a pretested, structured questionnaire. Relevant sociodemographic information, including age, residence, occupation and educational status, was recorded. A detailed menstrual history was obtained, including the onset, duration, frequency and amount of menstrual bleeding, along with associated symptoms, relevant medical history and medication history. All participants underwent general physical, neck, systemic and gynaecological examinations. Relevant clinical findings were recorded in the structured data collection form. Routine investigations included haemoglobin estimation, erythrocyte sedimentation rate (ESR), liver function tests (LFT), random blood glucose, complete urine examination, bleeding time and clotting time. Other investigations included chest X-ray, ultrasonography of the abdomen and pelvis, and Pap smear. Endometrial biopsy was performed where indicated.

Thyroid function was assessed in all participants by measuring serum triiodothyronine (T3), thyroxine (T4) and thyroid-stimulating hormone (TSH) in the same laboratory at BSMMU. Based on the laboratory findings, participants were classified into three groups: euthyroid, hypothyroid and hyperthyroid. Among the 50 participants, 37 were euthyroid and 13 had thyroid dysfunction, including 9 with hypothyroidism and 4 with hyperthyroidism.

Menstrual bleeding patterns were assessed based on the menstrual history obtained from each participant. The patterns were categorized as menorrhagia, polymenorrhoea, polymenorrhagia, oligomenorrhoea and hypomenorrhoea. The distribution of these patterns was evaluated among women with thyroid dysfunction. Further assessment was performed separately among women with hypothyroidism and hyperthyroidism to describe the menstrual bleeding patterns according to the type of thyroid dysfunction. The distribution of menstrual bleeding patterns was also compared across the three thyroid function groups.

Ethical approval was obtained from the appropriate Ethical Review Committee of BSMMU. Written informed consent was obtained from each participant before enrolment in the study. Participation was voluntary, and confidentiality of all collected information was maintained throughout the study.

Statistical Analysis:

All collected data were checked, cleaned and analysed using the Statistical Package for Social Sciences (SPSS), version 16.0. Quantitative data were expressed as mean and standard deviation, while qualitative data were presented as frequencies and percentages. The association between thyroid function status and menstrual bleeding patterns was assessed using the Freeman–Halton extension of Fisher's exact test because of small expected cell frequencies in the contingency table. A p-value of less than 0.05 was considered statistically significant.

RESULT

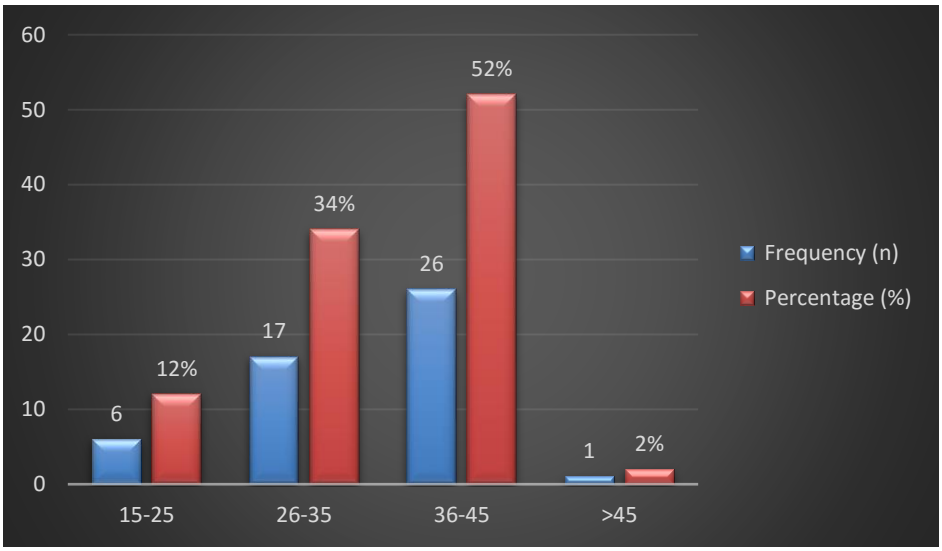


Figure 1: Age distribution of the study participants (50)

Figure 1 shows the age distribution of the study participants. The majority (52.0%) were aged 36–45 years, followed by 34.0% aged 26–35 years. The mean age of the participants was 34.57 ± 9.27 years.

Table 1: Distribution of study participants according to sociodemographic characteristics

Characteristics	Frequency (n)	Percentage (%)
Residence		
Urban	29	58.0
Rural	15	30.0
Suburban/slum	6	12.0
Occupation		
Housewife	28	56.0
Daily worker	11	22.0
Service holder	6	12.0
Schoolteacher	5	10.0
Educational status		
Primary	23	46.0
Secondary	7	14.0
Higher secondary	4	8.0
Can sign only	6	12.0
Illiterate	10	20.0

Table 1 shows the sociodemographic characteristics of the participants. Regarding residence, 58.0% were from urban areas, while 30.0% were from rural areas and 12.0% from suburban or slum areas. Housewives constituted the largest occupational group (56.0%). Nearly half of the participants (46.0%) had primary-level education.

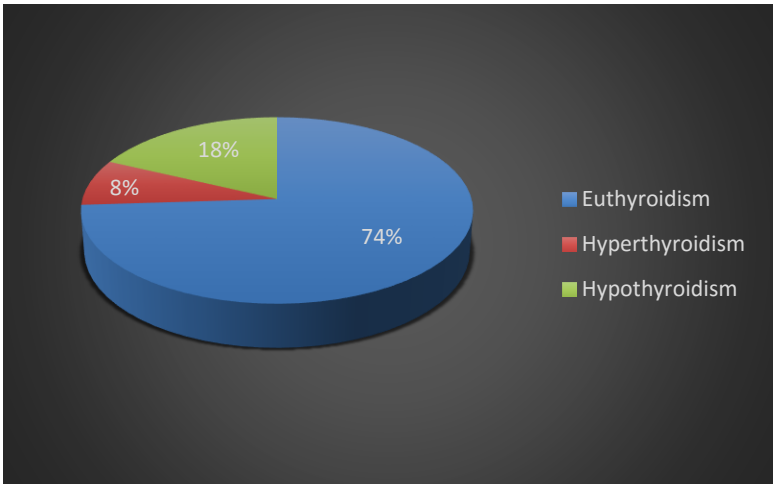


Figure 2: Distribution of study participants according to thyroid function status (n=50)

Figure 2 shows the distribution of study participants according to thyroid function status. Among the 50 women with abnormal uterine bleeding, 37 (74.0%) were euthyroid, while 13 (26.0%) had thyroid dysfunction. Among those with thyroid dysfunction, 9 (18.0%) had hypothyroidism and 4 (8.0%) had hyperthyroidism. Hypothyroidism was the most common thyroid abnormality among the study participants.

Table 2: Distribution of menstrual bleeding patterns among women with thyroid dysfunction (n=13)

Menstrual bleeding pattern	Frequency (n)	Percentage (%)
Menorrhagia	8	61.53
Polymenorrhoea	3	23.07
Polymenorrhagia	1	7.69
Oligomenorrhoea	1	7.69
Hypomenorrhoea	0	0
Total	13	100

Table 2 shows the distribution of menstrual bleeding patterns among women with thyroid dysfunction (n=13). Menorrhagia was the most common menstrual bleeding pattern, observed in 8 (61.53%) women, followed by polymenorrhoea in 3 (23.07%) women. Polymenorrhagia and oligomenorrhoea were each observed in 1 (7.69%) woman. No cases of hypomenorrhoea were reported.

Table 3: Distribution of menstrual bleeding patterns according to thyroid dysfunction (n=13)

Menstrual bleeding pattern	Hypothyroidism (n=9) n (%)	Hyperthyroidism (n=4) n (%)
Menorrhagia	6 (66.7)	2 (50.0)
Polymenorrhoea	1 (11.1)	2 (50.0)
Polymenorrhagia	1 (11.1)	0 (0.0)
Oligomenorrhoea	1 (11.1)	0 (0.0)
Hypomenorrhoea	0 (0.0)	0 (0.0)
Total	9 (100.0)	4 (100.0)

Table 3 shows the distribution of menstrual bleeding patterns according to the type of thyroid dysfunction. Among the 9 women with hypothyroidism, menorrhagia was the predominant bleeding pattern, observed in 6 (66.7%) cases, followed by polymenorrhoea in 1 (11.1%), polymenorrhagia in 1 (11.1%), and oligomenorrhoea in 1 (11.1%) case. Among the 4 women with hyperthyroidism, menorrhagia and polymenorrhoea were equally prevalent, each occurring in 2 (50.0%) cases. No cases of polymenorrhagia, oligomenorrhoea, or hypomenorrhoea were observed among women with hyperthyroidism.

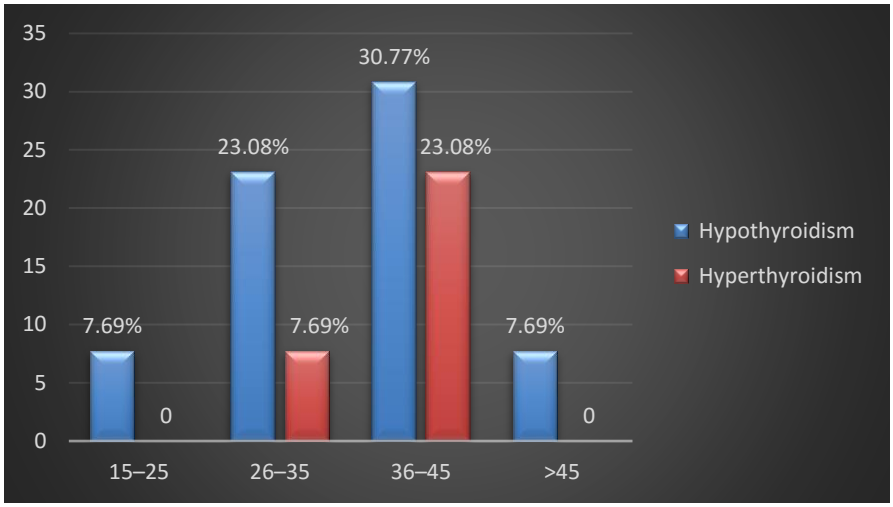


Figure 3: Age-wise distribution of thyroid dysfunction among study participants (n=13)

Figure 3 shows the age-wise distribution of hypothyroidism and hyperthyroidism among women with thyroid dysfunction (n=13). Hypothyroidism was most frequently observed in the 36–45 years age group, accounting for 4 (30.77%) cases, followed by 3 (23.08%) cases in the 26–35 years age group. One (7.69%) case each was observed in the 15–25 years and above 45 years age groups. Similarly, hyperthyroidism was most common in the 36–45 years age group, accounting for 3 (23.08%) cases, while 1 (7.69%) case was observed in the 26–35 years age group. No cases of hyperthyroidism were found in the other age groups.

Table 4: Distribution of associated clinical manifestations among study participants (n=50)

Clinical manifestations	Frequency (n)	Percentage (%)
Per vaginal bleeding	50	100
Abdominal pain	38	76
Lump in lower abdomen	13	26
Heaviness in lower abdomen	27	54
Weight loss	9	18
Weight gain	14	28
Altered bowel habit	18	36
Loss of appetite/dyspepsia	25	50
Nausea/vomiting	34	68

Table 4 shows the distribution of associated clinical manifestations among the study participants (n=50). Per vaginal bleeding was reported by all 50 (100.0%) participants, followed by abdominal pain in 38 (76.0%) and nausea and vomiting in 34 (68.0%) participants. Heaviness in the lower abdomen was reported by 27 (54.0%), while loss of appetite and dyspepsia were observed in 25 (50.0%) participants. Other manifestations included altered bowel habits in 18 (36.0%), weight gain in 14 (28.0%), a lump in the lower abdomen in 13 (26.0%), and weight loss in 9 (18.0%) participants.

DISCUSSION

This study examined menstrual bleeding patterns in women with thyroid dysfunction who presented with AUB at a tertiary hospital in Bangladesh. Of the 50 women with AUB, 13 (26.0%) had thyroid dysfunction, hypothyroidism (18.0%) was twice as common as hyperthyroidism (8.0%), and menorrhagia was the commonest bleeding pattern (61.53%) among those with thyroid dysfunction.

The prevalence of thyroid dysfunction in our series agrees closely with the only other recent study from the same institution. Fatema *et al.,* reported thyroid dysfunction in 26% of 100 women with AUB at BSMMU, with hypothyroidism in 18% and hyperthyroidism in 8%, the same distribution that we found.[13] Our figure also lies within the range reported from neighbouring countries: 28.8% in Karnataka,[14] 29% in Hyderabad,[15] 32% in a series of 100 women,[16] 35.1% in a study of 157 women[17] and 36.1% in Pakistan.[18] A lower prevalence of 12.14% was reported by Patil *et al.,*[19] Part of this spread probably reflects differences in referral populations, sample size and the way subclinical disease was classified, so that the figures are not strictly comparable. Overall, the evidence supports the view that thyroid dysfunction is found in roughly one in four to one in three women who attend with AUB.

Hypothyroidism predominated over hyperthyroidism, as in most comparable studies. Spurthi *et al.,* found hypothyroidism in 32.5% and

hyperthyroidism in only 2.6% of women with AUB,[17] Koneru *et al.,* found hypothyroidism in 25.3% with hyperthyroidism being rare,[15] and Kothapalli and Kolluru reported hypothyroidism as the commonest thyroid disorder in women with menstrual complaints.[20] Our hyperthyroidism rate of 8.0% is higher than the 2.6%, 2% and 1.4% reported by Spurthi, Sudha and Patil, respectively,[16,17,19] but is close to the 6.6% of Soomro *et al.,*[18] and the 8% of Fatema *et al.,*[13] The small number of hyperthyroid women in our sample (n = 4) means that this estimate is imprecise. Biologically, thyroid hormones act on the ovary and endometrium, and they alter sex hormone-binding globulin, gonadotropin and prolactin secretion, which explains how thyroid disease can disturb ovulation and menstrual bleeding. [21,22]

Menorrhagia was the commonest pattern among our women with thyroid dysfunction (61.53%), followed by polymenorrhoea (23.07%). Spurthi *et al.,* similarly found menorrhagia in 74.6% of hypothyroid women with AUB.[17] Soomro *et al.,* reported menorrhagia as the most frequent pattern and found it significantly associated with thyroid abnormality (p = 0.032).[18] Studies that calculated the proportion among all women with AUB, whether or not they had thyroid disease, gave lower values for menorrhagia: 44.28%,[19] 42.5%,[14] 40% [20] and 35%,[16] with polymenorrhoea second at 30% in the last of these.[16] Our higher percentage is partly explained by the denominator, because we calculated patterns only among women with thyroid dysfunction, and so the figures should be compared with caution. Wilansky and Greisman provide supportive clinical evidence that is relevant to this finding: 15 of 67 apparently euthyroid women with menorrhagia (about 22%) had early hypothyroidism, and menorrhagia resolved after levothyroxine treatment.[23]

The pattern in hypothyroid women in our study, with menorrhagia in 66.7% and only one case of oligomenorrhoea, is in keeping with Kothapalli and Kolluru, who observed that menorrhagia and polymenorrhagia were more common than amenorrhoea and oligomenorrhoea in hypothyroid patients.[20] In our four hyperthyroid women, menorrhagia and polymenorrhoea each occurred in two cases and no one had hypomenorrhoea or oligomenorrhoea. This differs from Sudha *et al.,* in whom all hyperthyroid women were oligomenorrhoeic,[16] and from Kakuno *et al.,* who found that severe hyperthyroidism was associated with more hypomenorrhoea and secondary amenorrhoea.[24] With only four cases, and without grading of severity, our hyperthyroid findings can only be regarded as descriptive. Kakuno *et al.,* also reported that menstrual disturbances in thyroid disease were less frequent than previously believed, and that they were commoner in severe hypothyroidism (34.8%) than in mild-to-moderate disease (10.2%),[24] which suggests that the severity of thyroid dysfunction may influence the bleeding pattern.

Oligomenorrhoea accounted for only one case (7.69%) in our series. In contrast, Koneru *et al.,* found oligomenorrhoea to be the commonest pattern (45%) and to be significantly associated with thyroid dysfunction,[15] and Nargis *et al.,* in Dhaka found it to be the commonest menstrual irregularity among infertile women with hypothyroidism.[25] These studies enrolled women with broader menstrual disorders or infertility rather than women who presented specifically with AUB, which probably accounts for the difference.

Most of our participants were aged 36–45 years (52.0%), with the same age group also accounting for the majority of thyroid dysfunction (four hypothyroid and three hyperthyroid cases). This is similar to the 41–50-year peak of Spurthi *et al.,*[17] and the 31–40-year peaks reported by Sudha *et al.,* and Patil *et al.,*,[16,19] while Fatema *et al.,* found most women at 26–35 years.[13] Soomro *et al.,* found thyroid dysfunction to be more prevalent after 30 years, although the difference was not significant.[18] The predominance of urban residents (58.0%) is identical to that in Fatema *et al.,*[13] and probably reflects the referral pattern of a tertiary hospital in the capital rather than the true distribution in the community.

The associated symptoms in our study, namely abdominal pain (76.0%), nausea or vomiting (68.0%) and lower abdominal heaviness (54.0%), are not specific to thyroid disease. They may be explained by coexisting gynaecological conditions, which have to be excluded in every woman with AUB. In the PALM-COEIN system, thyroid disease falls under ovulatory dysfunction, whereas structural causes such as leiomyoma and adenomyosis are separate categories.[26] In the BSMMU series of Fatema *et al.,* leiomyoma (53%) and adenomyosis (28%) accounted for most cases of AUB,[13] and thyroid dysfunction can therefore coexist with, rather than replace, a structural cause. This is why a structured evaluation of AUB remains essential,[27] and why thyroid function testing should be considered as one part of that evaluation rather than as a substitute for gynaecological assessment. Several of the studies we cite recommend routine thyroid testing in AUB, and some suggest that early detection and treatment may avoid unnecessary surgery [14-16, 19].

Overall, the findings of this study suggest that thyroid dysfunction, particularly hypothyroidism, is a relatively common finding among women presenting with abnormal uterine bleeding (AUB). Menorrhagia was the predominant menstrual bleeding pattern among women with thyroid dysfunction, followed by polymenorrhoea. These findings highlight the importance of assessing thyroid function in women presenting with AUB as part of a comprehensive clinical

evaluation, along with appropriate gynaecological examination and investigation.

Limitations of the study

This study was limited by its small sample size, single-centre setting and non-probability sampling. The small number of women with thyroid dysfunction restricted subgroup interpretation. The cross-sectional design could not establish causality, and other potential causes of AUB were not fully evaluated. Additionally, reliance on patient-reported menstrual history may have introduced recall bias.

CONCLUSION

About one in four women with AUB in this tertiary care hospital in Bangladesh had thyroid dysfunction, and hypothyroidism was the commoner type. Menorrhagia was the predominant bleeding pattern among women with thyroid dysfunction (61.53%), followed by polymenorrhoea (23.07%), and menorrhagia was the leading pattern in hypothyroid women (66.7%). These findings are broadly consistent with those of regional studies. Because thyroid disease is common, treatable and easily detected, thyroid function testing should be considered in the evaluation of women with AUB, alongside a complete gynaecological assessment. Larger multicentre studies that include euthyroid comparison groups and grade the severity of thyroid disease are recommended.

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Conflicts of Interest: There are no conflicts of interest.

Ethical Approval: The study was approved by the Ethical Review Committee of BSMMU.

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