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**Original Research Article**

# A descriptive cross-sectional study of association between abnormal uterine bleeding and thyroid dysfunction

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## ABSTRACT

**Background:** Abnormal uterine bleeding (AUB) is one of the most common gynecological presentation, accounting for at least 20% of all outpatient visits. Thyroid dysfunction has profound effect on the female reproductive system. Both hypothyroidism and hyperthyroidism are associated with untoward menstrual changes. This study aims to find the prevalence of thyroid dysfunction among patients with diagnosed AUB.
**Methods:** A descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynaecology at General Hospital Jayanagar, Bengaluru. After taking ethical clearance from the Institutional Review Committee, the study was conducted on 100 patients with AUB satisfying the inclusion and exclusion criteria from November 2020 to May 2022. Thyroid function test was done in all patients by radioimmunoassay on an automated analyzer. Data was collected using a questionnaire which includes patient's profile, pattern of AUB, examination and thyroid profile.
**Results:** Out of 100 patients, it was found that 75% were euthyroid, 20% were hypothyroid, among which 15% had subclinical hypothyroidism and 5% had overt hypothyroidism and 5% were hyperthyroidism. The most common type of AUB was menorrhagia in 38%, followed by acyclical bleeding in 33%, polymenorrhoea in 11%, metrorrhagia in 8%, oligomenorrhoea in 7%, and hypomenorrhea in 3%. The maximum number of patients were between 30-40 years.
**Conclusions:** Thyroid dysfunction is one of the important causes of AUB with hypothyroidism being the most common type in patients with menorrhagia. It was reported that their symptoms improved with thyroid medication.

**Keywords:** Abnormal uterine bleeding, Hyperthyroid, Hypothyroid, Menstrual patterns, Thyroid function test

## INTRODUCTION

Abnormal uterine bleeding (AUB) is considered as one of the most common clinical presentations.[1] It occurs in 10-20% of women between 15-50 years of age.[2] It is defined as any variation from the normal menstrual cycle and includes changes in regularity, frequency, duration of flow, or amount of blood loss affecting the quality of life. "FIGO Palm Coein" classification for causes of AUB includes both structural and non-structural causes.[3] Structural causes are polyp, adenomyosis, leiomyoma, malignancies, and hyperplasia and non-structural causes include coagulopathy, ovulatory, endometrial causes, iatrogenic, and not yet classified causes.[4]

The thyroid hormone has an impact on reproductive biology.[5] Due to similarity of thyroid stimulating hormone (TSH) to follicle stimulating hormone (FSH) and leutinizing hormone (LH), thyroid hormones can affect menstrual cycle by direct action on ovaries or on sex hormone binding globulin (SHBG), prolactin and gonadotropin releasing hormone (GnRH).[6]

Thyroid dysfunction accounts for 30-40% of cases in systemic disorders causing AUB. Hypothyroidism has been found to cause menorrhagia and hyperthyroidism to cause oligomenorrhoea and amenorrhoea.[5] This may significantly affect the quality of life, and result in time off the work, leading to surgical interventions including

hysterectomy and ultimately have a significant impact on the health care system.[7-10]

Most cases of anovulatory bleeding can be treated by hormonal and non-hormonal medicines, thus avoiding surgeries.[11] Treating thyroid dysfunction has shown to improve the menstrual abnormalities.[12,13]

This study aims to find the prevalence of thyroid dysfunction in reproductive age women with AUB.

## METHODS

This was a hospital based cross-sectional study carried from November 2020 to May 2022 after getting approval from the institutional ethical committee. A sample size of 100 women was obtained using sample size formula for estimating proportions in the context of confidence intervals. All patients who were provisionally diagnosed to have AUB from puberty upto 45 years were included in study. Patients who were on hormonal medication, menopausal women, pregnant women, intrauterine contraceptive device (IUCD) users, history of bleeding disorder were excluded from the study.

After obtaining informed written consent, a detailed history examination and ultrasonography was done for all patients followed by baseline investigations. Serum levels of thyroid-stimulating hormone (TSH), T3 and T4 were estimated by immunofluorescence assay. The normal range of thyroid function considered in my study is depicted in Table 1.

**Table 1: Normal range of thyroid profile values considered in this study.**

| S. no. | Hormones | Normal range |
|---|---|---|
| **1** | TSH | 0.4-4.2 µIU/ml |
| **2** | Total T4 | 5.3-10.5 µg/dl |
| **3** | Total T3 | 70-204 ng/dl |

Patients were then grouped into 4 categories namely euthyroid, subclinical hypothyroid, hypothyroid, hyperthyroid. Patients found to have thyroid dysfunction were put on medication. For patients with co-existing other causes of AUB were treated accordingly in the Department of OBG, General Hospital Jayanagar, Bangalore.

The association of thyroid dysfunction with various parameters like age, parity, menstrual pattern, cause of AUB was done by applying student's t-test. The results were considered by p value. P value <0.05 indicated statistically significant data.

## RESULTS

In the current study 100 patients having AUB from puberty till 45 years of age were considered, excluding the menopausal women. Majority of patients were from 31 to 40 years accounting for 36% as shown in Figure 1. Mean age group of AUB was 30.59.

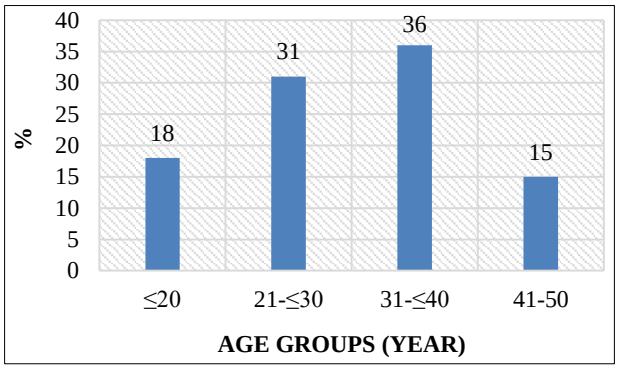


**Figure 1: Age distribution.**

Majority of the patients were nulliparous and contributed to 35% of the sample size. Parity index of one, two, three and four were 7%, 28%, 24%, 6% respectively among the study.

Among 100 patients with AUB, majority of the patients had menorrhagia accounting for 38%. Followed by acyclical menstrual bleeding accounting for 33% patients with as depicted in Figure 2. Acyclical bleeding (61.1%) was the major complaint among less than 20 years with significant p value of 0.009. From age 21 to 45 years majority had menorrhagia as their complaint with significant p value of 0.008.

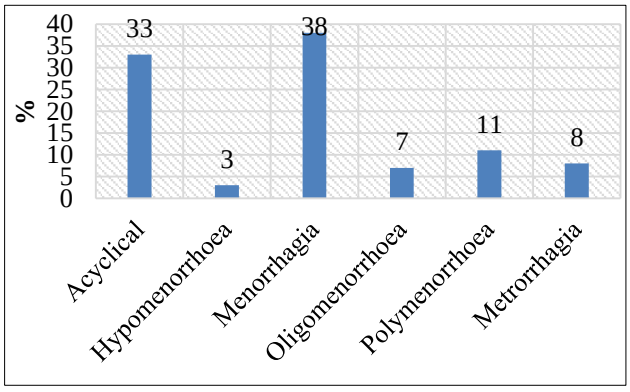


**Figure 2: Bleeding pattern in AUB.**

Figure 3 depicts the thyroid dysfunction among AUB patients. TSH level of 0.4 µg is considered as lower limit and more than 4.2 µg as higher limit of TSH. Majority of them, that is 75% were euthyroid. 25% of patients had abnormal thyroid function test among which subclinical hypothyroid, hypothyroid and hyperthyroidism were 15%, 5%, 5% respectively. Subclinical hypothyroidism accounted to 60% of all thyroid disorder. The incidence of thyroid dysfunction was seen maximum among age group 31 to 40 years. On considering parity index highest incidence of thyroid dysfunction was seen among nulliparous women accounting for 44%.

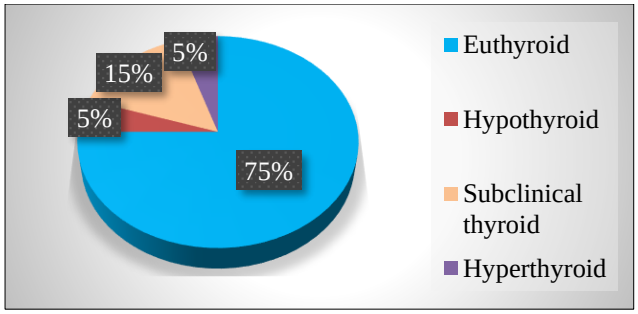


**Figure 3: Thyroid function status.**

Among 25 patients with thyroid dysfunction, majority had acyclical menstrual bleeding accounting for 44% (n=11). 24% (n=6) had menorrhagia. 16% (n=4) had oligomenorrhoea. 8% (n=2) had polymenorrhoea and 8% (n=2) had metrorrhagia as depicted in Table 2.

On considering the cause of AUB, large proportion of patients (40%) had no abnormality on USG, followed by fibroid (19%) and PCOD features (18%) as shown in graph 4. Structural and non structural causes of AUB contributed to 42% and 58% respectively.

Table 3 shows the relationship between thyroid dysfunction and causes of AUB. Among 25 patients, thyroid dysfunction was very significant in patients with PCOD (44%), 12% had fibroid, 8% had adenomyosis, 8% had PID and 28% had other causes (non-structural) which include hormonal causes, ovarian causes, no sonological abnormality and cervical lesion.

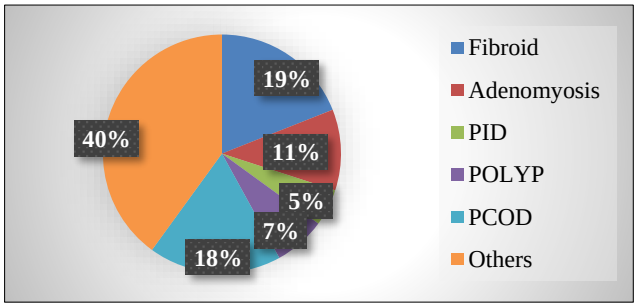


**Figure 4: Causes of AUB.**

**Table 2: Thyroid functional status and menstrual bleeding pattern.**

| Bleeding pattern | Total | Euthyroid | Thyroid dysfunction | | | | % Thyroid dysfunction |
|---|---|---|---|---|---|---|---|
| | | | Hyper thyroid | Hypo thyroid | Sub-clinical hypothyroid | Total | |
| **Acyclical** | 33 | 22 | 3 | 1 | 7 | 11 | 44 |
| **Hypomenorrhoea** | 3 | 3 | 0 | 0 | 0 | 0 | 0 |
| **Menorrhagia** | 38 | 32 | 1 | 2 | 3 | 6 | 24 |
| **Oligomenorrhoea** | 7 | 3 | 1 | 1 | 2 | 4 | 16 |
| **Polymenorrhoea** | 11 | 9 | 0 | 0 | 2 | 2 | 8 |
| **Metrorrhagia** | 8 | 6 | 0 | 1 | 1 | 2 | 8 |

**Table 3: Association between thyroid status and causes of AUB.**

| Causes of AUB | Total | Euthyroid | Thyroid dysfunction | | | | % Thyroid dysfunction |
|---|---|---|---|---|---|---|---|
| | | | Hyper thyroid | Hypo thyroid | Sub-clinical hypothyroid | Total | |
| **Fibroid** | 19 | 16 | 1 | 0 | 2 | 3 | 12 |
| **Adenomyosis** | 11 | 9 | 0 | 1 | 1 | 2 | 8 |
| **PID** | 5 | 5 | 0 | 0 | 0 | 0 | 0 |
| **Polyp** | 7 | 5 | 0 | 0 | 2 | 2 | 8 |
| **PCOD** | 18 | 7 | 4 | 1 | 6 | 11 | 44 |
| **Others** | 40 | 33 | 0 | 3 | 4 | 7 | 28 |

**Table 4: Follow up of AUB patients with thyroid dysfunction.**

| Thyroid dysorder | Total | Follow-up | Lost for follow up |
|---|---|---|---|
| **Subclinical hypothyroid** | 15 | 11 | 4 |
| **Hypothyroid** | 5 | 2 | 3 |
| **Hyperthyroid** | 5 | 2 | 3 |
| **Total** | 25 | 15 | 10 |

## DISCUSSION

The present study was done in the Department of Obstetrics and Gynaecology, General Hospital Jayanagar, Bangalore. A total of 100 patients were considered in this descriptive cross-sectional study.

AUB is one of the most common findings among females of reproductive age in this era. Thyroid dysfunction is one of the occult cause of AUB which when treated may reduce symptoms and surgical intervention.[14] The main

aim of the study was to screen for thyroid function test in patients with AUB and decrease the morbidity of patient. Thyroid dysfunction is common in women and has its effect on all events right from menarche to menopause and cannot be overlooked while treating any forms of menstrual disturbances.[15,16]

Our study consisted of women from puberty till 45 years of age. Similar age group was considered in other studies done on this topic. Majority of AUB patients were from the age group of 31-40 years in our study. In Kattal et al, Rai et al, and Sahu et al, age of majority of patients with AUB was similar to our study where as in the study of Hema et al, and Bedi et al majority of patients with AUB fall under age 41 to 50 years.[17-21]

In this study, 25% cases of AUB had thyroid dysfunction and 75% cases were euthyroid. Out of cases with thyroid dysfunction, subclinical hypothyroid was most common followed by hypothyroid and hyperthyroid. Hypothyroidism is generally known to cause heavy and irregular menstrual bleeding and hyperthyroidism is generally associated with hypo, oligo and amenorrhoea.[5]

Our finding is similar to other studies like Kattal et al, Rai et al, Sahu et al, Hema et al, and Bedi et al where majority of AUB cases were associated with euthyroidism followed by subclinical hypothyroidism.[17-21] Subclinical hypothyroidism was more than overt hypothyroidism in all studies therefore early correction of thyroid levels will lead to better outcome of life.

The most common pattern of AUB among those aged more than 20 years was found to be menorrhagia (38%) with significant p value of 0.008. In those less than 20 years majority had acyclical bleeding accounting for 33% with significant p value of 0.009.

Menorrhagia was common among other studies like Kattal et al, Rai et al, Sahu et al, Hema et al, and Bedi et al accounting to 36.7%, 86%, 42%, 51% and 31% respectively.[17-21]

On observing individual types of AUB, Majority of patients, about 44% with thyroid dysfunction had acyclical bleeding followed by 24% had menorrhagia and none had hypomenorrhoea in the study. This finding is similar to study done by Kattel et al.[17] Subclinical hypothyroidism was the predominant thyroid dysfunction among both acyclical bleeding and menorrhagia.

Out of 25 patients with thyroid dysfunction, 15 patients came back for follow up with in 2-3 months as shown in Table 4. These 15 patients were taking regular thyroid medications, as prescribed. Their symptoms were found to be reduced with initiation of thyroid medications. However, 6 patients were on both thyroid and hormonal medication. Therefore, the benefits of thyroid medication alone on AUB could not be determined among these patients.

In this study, we found that majority of the women with AUB were euthyroid. In hypothyroid patients most common presentation of AUB was acyclical bleeding followed by menorrhagia, oligomenorrhoea, metrorrhagia, and polymenorrhoea.

Thyroid abnormality was very significant in patients with non structural cause like PCOD than structural cause. Therefore, a thyroid screening test can be conducted in women with AUB to detect thyroid dysfunction, as it is inexpensive, easy to perform, and aids in accurately diagnosing the etiology of AUB.

## CONCLUSION

Thyroid dysfunction is one of the important causes of AUB with hypothyroidism being the most common type in patients with menorrhagia. It was reported that their symptoms improved with thyroid medication.

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