

## Study of Thyroid Dysfunction in Patients with Menstrual Disorders

Shweta Mehta<sup>1\*</sup>, Shubha Pande<sup>2</sup> and Krishna Mukherjee<sup>3</sup>

<sup>1</sup>MBBS, DNB Resident, Department of Obstetrics and Gynaecology, Kamla Nehru Memorial Hospital, Prayagraj, India

<sup>2</sup>Senior Consultant, Department of Obstetrics and Gynaecology, Kamla Nehru Memorial Hospital, Prayagraj, India

<sup>3</sup>Medical Superintendent, Chief Consultant, Kamla Nehru Memorial Hospital, Prayagraj, India

**\*Corresponding Author:** Shweta Mehta, MBBS, DNB Resident, Department of Obstetrics and Gynaecology, Kamla Nehru Memorial Hospital, Prayagraj, India

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### Abstract

**Objectives:** To categorise the patients into 4 categories- Euthyroid, Subclinical hypothyroid, Hypothyroid, Hyperthyroid. To determine the type of Menstrual bleeding pattern in relation to different thyroid disorders.

**Methods:** This study is a prospective observational (non-interventional) study undertaken in the Department of Obstetrics and Gynaecology, K.N.M.H, Allahabad from July 2019 to June 2020. A total of 100 patients attending the inpatient and outpatient department of obstetrics and gynaecology department in the age group of 15 - 45 years with complaints of menorrhagia, oligomenorrhea, polymenorrhea, amenorrhea and hypomenorrhea fulfilling the inclusion criteria and exclusion criteria were included in the study and categorized into 4 groups: euthyroid, hypothyroid, subclinical hypothyroid, hypothyroid and hyperthyroid respectively and then comparison among all the groups were done with respect to age, parity, BMI, TSH, FT<sub>3</sub>, FT<sub>4</sub> levels and histopathological findings.

**Results and Interpretation:** All the groups were comparable in terms of age, parity, BMI and family history although the majority of cases of AUB was found in the age group of 36 - 45 years. Subclinical hypothyroidism was found to be the most prevalent thyroid disorder (18%) with menorrhagia as the most common menstrual disorder (n = 12, 66.67%). Hyperthyroid patients (n = 2, 2%) had oligomenorrhea (n = 2, 100%) as the most common complaint.

**Conclusion:** There is high incidence of thyroid diseases in patients of AUB in the present study. Evaluating for thyroid and treating it medically which was most accurate and cost effective and unnecessary surgery was avoided. Hence the thyroid function evaluation should be mandatory in cases of DUB to detect thyroid dysfunction and these cases should be referred to physician for further medical treatment.

**Keywords:** Hypothyroidism; AUB; Hyperthyroidism; Menorrhagia; Subclinical Hypothyroidism; Thyroid Dysfunction; Oligomenorrhea

### Introduction

Abnormal uterine bleeding is a term used to describe any type of bleeding that does not fall within the normal range of amount, frequency, duration and cyclicity. The prevalence is 9 - 14% of women from menarche to menopause and it also affects the quality of life resulting in financial burden as well [1]. The International Federation of Gynaecology and Obstetrics formally accepted a new classification system for the causes of AUB in reproductive years after 2010. The acronym is PALM-COEIN. It includes.

Structural causes: P- polyps A-Adenomyosis L- Leiomyomas M- malignancy.

Non-structural causes: C- coagulopathy O- ovulatory E- endometrial I-Iatrogenic N- not classified.

The cause for dysfunction in the ovaries leading to AUB is either a primary defect or a pathological lesion, or it can be secondary to malfunction of either glands, most importantly hypothalamus, pituitary gland and thyroid. 15 - 26% of menstrual disorders are attributed to thyroid dysfunction [2]. Thyroid hormones exert their effect on the menstrual cycles either directly through ovarian specific thyroid hormone receptors or indirectly through their effect on SHBG, prolactin, GnRH and coagulation factors [3,4].

Hypothyroidism causes excessive menstrual bleeding and severe blood loss. The mechanism for this is not clearly understood. As per the studies menorrhagia is known to be prevalent in 33% of the cases with hypothyroidism. This is due to poor progesterone production leading to persistent endometrial proliferation that may be responsible for massive bleeding. Another mechanism for this may be failure of LH secretion. 44.4% patients with hypothyroidism had oligomenorrhoea due to increased prolactin secretion. In hyperthyroid patients amenorrhoea was described by Von Basedow [5]. The menstrual changes observed ranges from normal cycles to oligomenorrhoea and hypomenorrhoea. In fertile age group, oligomenorrhoea and amenorrhoea are the commonest abnormalities. As menarche, pubertal growth and development, menstrual cycles, fertility and fetal development, post- partum period, reproductive years and menopausal years are profoundly influenced by the thyroid status of the women, timely detection of thyroid dysfunction in patients presenting with AUB should be done.

### Objectives of the Study

To categorise the patients into 4 categories- Euthyroid, Subclinical hypothyroid, Hypothyroid, Hyperthyroid

To determine the type of menstrual bleeding pattern in relation to different thyroid disorders.

### Materials and Methods

#### Study area

The present hospital based study was carried out in women attending the inpatient and outpatient department of obstetrics and gynaecology department of Kamala Nehru Memorial Hospital, Prayagraj.

#### Study population

Patients attending the Obstetrics and Gynaecology OPD and IPD with complaints of abnormal uterine bleeding e.g. menorrhagia polymenorrhoea, oligomenorrhoea, amenorrhoea and hypomenorrhoea falling in the age group of 15 - 45yrs.

#### Data collection technique and tools

The data that needed to be collected included details of the abnormal menstrual bleeding pattern in women belonging to the reproductive age group and their thyroid profile.

Inclusion criteria included: i. Patients attending the Obstetrics and Gynaecology OPD and IPD with complaints of abnormal uterine bleeding e.g. menorrhagia, polymenorrhoea, amenorrhoea, oligomenorrhoea and hypomenorrhoea. ii. Age group of 15-45yrs. iii. Ultrasound showing normal uterus and ovaries. Exclusion criteria included: i) Diagnosed case of ovarian cyst, uterine fibroid, polyp, adenomyosis, endometriosis and malignant (endometrial and cervical) tumors. ii. Premalignant lesions, genital organ malignancy, and autoimmune thyroid diseases. iii. IUCD users, OC pill users, patients on anticoagulants, antithyroid drugs and thyroxin. vi. Patients with overt clinical symptoms of thyroid dysfunction. vii. History of bleeding disorders (hemophilia, Von Willebrand's disease). viii. Known cases of PID, endometritis and PCOS. ix. Patients on sex steroids. x. Patients not willing to give consent. xi. History of abortion within 3 months. xii. History of childbirth within 1 year.

The data collected included detailed description of the abnormal menstrual history, routine haematological parameters, thyroid function tests. A study proforma was devised to inculcate all the parameters.

#### Data analysis

The data so collected was fed into computer using MS-Excel software. The statistical analysis was done using SPSS (Statistical Package for Social Sciences) Version 15.0 statistical Analysis Software. The values were represented in Number (%) and Mean  $\pm$  SD. Continuous variables were expressed as mean  $\pm$  SD values and categorical variables as number (percentage). ANOVA test and was applied for continuous variables (association between different types of AUB and thyroid profile) and chi-square test for categorical variables at 95% confidence interval.

Results

Type of Thyroid Dysfunction	N
Euthyroid	70
Hypothyroidism	10
Subclinical Hypothyroidism	18
Hyperthyroidism	2
Total	100

**Table 1:** Distribution of the patients between different types of thyroid disorders.

With respect to the type of thyroid disorders, subclinical hypothyroidism was the most prevalent which was seen in 18% of the patients whereas hyperthyroidism was seen in only 2% patients.

Age (years)	Hypothyroidism		Subclinical Hypothyroidism		Hyperthyroidism		Euthyroid	
	N	%	N	%	n	%	N	%
15 - 25	0	0.00%	3	16.67%	0	0.00%	7	10.00%
26 - 35	2	20.00%	6	33.33%	1	50.00%	23	32.86%
36 - 45	8	80.00%	9	50.00%	1	50.00%	40	57.14%
Total	10	100%	18	100%	2	100%	70	100%
Mean ± sd	38.50 ± 3.78		34.78 ± 7.5		37 ± 7.07		35.54 ± 6.74	
p-value	0.539							

**Table 2:** Distribution of the patients in different age groups according to their thyroid profile.

Thus, the maximum no. of AUB cases are found in 36 - 45 years of age irrespective of the thyroid status of the patient. In euthyroid group, 57.14% (n = 40) cases, 80% (8) in overt hypothyroid group and 50% cases each in subclinical hypothyroid and hyperthyroid group. Age group of 15 - 25 years had the least cases.

The p-value is 0.539 that was not statistically significant.

Type of AUB	N
Amenorrhoea	10
Hypomenorrhoea	3
Menorrhagia	52
Oligomenorrhoea	32
Polymenorrhoea	3

**Table 3:** Distribution of the patients according to the type of AUB.

Here, the maximum no. of patients (52%) had menorrhagia as their presenting complaint. Oligomenorrhea was seen in 32 (32%) of the patients.

Type of AUB	Hypothyroidism		Subclinical Hypothyroidism		Hyperthyroidism		Euthyroid		p-value
	N	%	N	%	N	%	N	%	
Amenorrhoea	1	10.00%	0	0.00%	0	0.00%	9	12.86%	0.310
Hypomenorrhoea	1	10.00%	1	5.56%	0	0.00%	1	1.43%	
Menorrhagia	7	70.00%	12	66.67%	0	0.00%	33	47.14%	
Oligomenorrhoea	1	10.00%	5	27.78%	2	100.00%	24	34.29%	
Polymenorrhoea	0	0.00%	0	0.00%	0	0.00%	3	4.29%	
Total	10	100%	18	100%	2	100%	70	100%	

**Table 4:** Distribution of type of AUB and type of thyroid disorder.

Among the hypothyroid patients, the most common bleeding pattern seen was menorrhagia in 7 patients (70%) in the overt hypothyroid group and 12 patients (66.67%) in the subclinical group. Even among the euthyroid patients, majority of the women i.e. 47.14% (33) had menorrhagia. In the hyperthyroid group, both the patients (100%) had oligomenorrhoea the association between different types of AUB with different thyroid disorders although were clinically significant, was not statistically significant (p-value 0.310).

	Amenorrhoea		Hypomenorrhoea		Menorrhagia		Oligomenorrhoea		Polymenorrhoea		P Value
	Mean	± Sd	Mean	± Sd	Mean	± Sd	Mean	± Sd	Mean	± Sd	
FT <sub>3</sub>	26.329	10.278	15.333	12.759	22.257	10.062	27.351	7.630	28.533	0.115	0.051
FT <sub>4</sub>	13.768	2.615	12.366	4.176	13.546	3.803	14.289	3.588	14.200	3.019	0.85
TSH	3.444	1.928	6.300	2.535	4.580	2.513	3.607	2.560	1.813	0.704	0.04

**Table 5:** Distribution of different types of AUB according to their thyroid profile.

The association between TSH levels and different menstrual disorders was found to be statistically significant (p value-0.04). The association between FT<sub>4</sub> and FT<sub>3</sub> was not significant statistically (p value 0.85 for FT<sub>4</sub> group and 0.051 in FT<sub>3</sub> group). Mean TSH values of the patients of menorrhagia was  $4.580 \pm 2.513$  mIU/ml but the highest mean TSH was observed in women with hypomenorrhoea i.e.  $6.3 \pm 2.535$  mIU/ml.

## Discussion

Prevalence of thyroid disorders in the present study was 30% with subclinical hypothyroidism seen in 18% followed by overt hypothyroidism in 10% while hyperthyroidism (2%) was the least prevalent. This is because the activity of thyroid gland is closely linked with ovarian maturation. And the gland is itself dependent on direct and indirect stimulation from the ovary to discharge its function. These findings in the present study were similar to Deshmukh, *et al.* (2015) [6] where the incidence of thyroid disorders was found to be 30% with subclinical hypothyroidism having the highest prevalence of 18% and hyperthyroidism was seen in 3% women. In another study done by Sakshi M., *et al.* (2018) [7] the prevalence of thyroid diseases was observed to be around 24.2%. In terms of AUB, menorrhagia was seen in 52% women followed by oligomenorrhoea (32%) and amenorrhoea (10%). This was similar to the results obtained by Deshmukh, *et al.* (2015) [6] and Kumar AHS., *et al.* [8]. Maximum (58%) cases of AUB were seen in the age group of 36 - 45 years, where menorrhagia was the most prevalent followed by oligomenorrhoea. This is because as the menopause approaches the number of ovarian follicles are decreased and they have an increased resistance to gonadotrophic stimulation which results in low level of estrogen, which cannot keep the normal endometrium growing. This causes anovulation and bleeding as a result of estrogen breakthrough. The endometrial growth without periodic shedding, results in eventual breakdown of fragile endometrial tissue and causes menorrhagia. Even on classifying different types of bleeding pattern with respect thyroid disorders, it was found that 70% cases of hypothyroid and 66.67% of

subclinical hypothyroidism had menorrhagia, making it the most prevalent menstrual disorder. This can be explained with the fact that thyroid hormones help in ovarian maturation. Hypothyroidism leads to anovulation due to unopposed estrogen activity which eventually results in breakthrough bleeding. This association was not found to be statistically significant. In a similar study done by Ezhil R., *et al.* (2018) [9] it was concluded that statistically significant association was not found between the pathology causing AUB and thyroid dysfunction ( $p = 0.066$ ). In the present study all (100%) of hyperthyroid patients had oligomenorrhea as compared to 34.29% in the euthyroid group. This can be explained as an increase in the thyroid hormone causes an increase in the concentration of SHBG that prevents ovulation, resulting in amenorrhea, hypomenorrhea and oligomenorrhea. In a study by Sakshi Mishra., *et al.* (2018) [7] the patients with menorrhagia were maximally presenting as hypothyroid (31.04%) and the patients who were having oligomenorrhoea presented equally as hyperthyroid (12.5%) and hypothyroid (12.5%). When these patients were subjected to hormonal tests, TSH was found to be the lowest in patients of polymenorrhea and highest in hypomenorrhea and menorrhagia. Mean  $FT_3$  and  $FT_4$  values were found to be the lowest in hypomenorrhea and menorrhagia. Khatiwada S., *et al.* (2016) [10] found that women with menorrhagia had higher TSH level and lower free  $T_3$  level than women with other menstrual disorders. TSH varied from  $0.06 \pm 0.03$  mIU/ml in hyperthyroidism upto  $7.9 \pm 0.78$  mIU/ml in subclinical hypothyroidism.

### Limitations of the Study

The no. of hyperthyroid patients found in the present study [2] were not sufficient enough to comment on the association between hyperthyroid patients and the menstrual disorder.

Invasive tests including the histopathological study of the endometrium should also be recommended that would further emphasise the association between thyroid disorders and the pattern of AUB.

### Conclusion

The prevalence of thyroid disorders is as high as 30% among women in our study. Most of the cases of AUB were seen in the age group of 36 - 45 years, where menorrhagia was the most prevalent followed by oligomenorrhea. Maximum cases of overt and subclinical hypothyroidism also had menorrhagia as the most prevalent menstrual disorder. Both the hyperthyroid patients had oligomenorrhea. So, in a woman presenting with AUB, it is recommended that thyroid function tests should be made mandatory even in the absence of clinical symptoms and signs of thyroid dysfunction. It would prove cost effective in these patients as it would avoid many costly interventions done for AUB. However, number of hyperthyroid patients obtained in the study were very less to study their association with the type of menstrual disorders. So, we recommend a multicentric study with a larger sample size and longer duration to assess the same.

### Conflict of Interest

None declared.

### Ethical Approval

The study was approved by institutional ethics committee.

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