**ABSTRACT**

**Background:** Abnormal uterine bleeding is a common complaint for women being referred to the gynaecologist and is associated with an array of symptoms. The objective of this study was to detect association of thyroid dysfunction in patients with menstrual irregularities.

**Methods:** This non-interventional prospective study was done over a period of one and half years in a private medical college in Mangalore. All patients in age group of 15-55 years who presented with history of menstrual disturbances were enrolled and evaluated in the study. Patients with structural causes of AUB or using IUCDs or hormonal steroids were excluded. Total of 85 patients were hence evaluated. These 85 patients were divided into two groups. Group A: AUB patients and Group B: Thyroid Dysfunction patients.

**Results:** The most common menstrual disturbance was menorrhagia (47 patients: 55.3%). Thyroid abnormalities were found in 29 of the 85 patients with AUB (34.11%). Of the 29 patients with thyroid dysfunction, 24 were hypothyroid and 5 patients were found to be hyperthyroid.

**Conclusions:** Thyroid abnormalities are frequently associated with menstrual irregularities. Hence Thyroid Function Tests are extremely valuable in patients with provisional diagnosis of AUB and should be made mandatory to avoid unnecessary hormonal or surgical treatment in such patients.

**Keywords:** Abnormal uterine bleeding, Hyperthyroidism, Hypothyroidism, Thyroid dysfunction.
Women with hypothyroidism usually present with menorrhagia (Goldsmith et al., 1952). Hyperthyroidism, on the other hand, is associated with amenorrhea, oligomenorrhea and the decrease in flow is proportional to the severity of thyrotoxicosis (Benson and Dailey, 1955).

Hypothyroidism even in subclinical form may result in excessive menstrual bleeding and severe blood loss. The exact mechanism of menorrhagia in hypothyroidism is not well understood. TRH causes increase in prolactin which thereby inhibits the LH surge. This leads to anovulatory cycle finally causing breakthrough bleeding associated with menorrhagia. Hyperthyroidism alters the peripheral metabolism of oestrogen; thereby decreasing sex hormone binding globulin (SHBG) production. Both the pathways may lead to abnormal feedback at the level of the pituitary gland. Independent of the hormonal mechanisms, hypothyroidism can cause menorrhagia by altered production of coagulation factors (decreased levels of factor 7, 8, 9, 11).

Hyperthyroidism-etiology of menstrual dysfunction is not known, whether it is primary effect of thyroid on ovary or uterus or mediated by pituitary dysfunction. The disturbances are probably a result of the effect of hypersecretion of thyroid hormones on the hypothalamic-pituitary axis with changes in gonadotrophin secretion, or on circulating SHBG, the levels of which are increased in thyrotoxicosis.

Thus, thyroid dysfunction is one very important cause of menstrual disturbances experienced by women. Its recognition is valuable as specific and reliable therapy is available.

METHODS

This non-interventional prospective study was done over a period of one and half years in a private medical college in Mangalore. 85 patients were included in the study. Detailed history was obtained with special relevance to age, bleeding pattern, onset, duration and amount of bleeding.

Inclusion criteria

- Patients belonging to any age group (15-50 years) complaining of irregular bleeding P/V (abnormality in frequency, amount or duration)
- No detectable disease in the genital tract.

Exclusion criteria

Patients suffering from the following conditions

- Endometrial polyp
- Uterine fibroid
- Adenomyosis
- Endometrial or cervical cancer
- Pelvic infections including endometritis
- Endometriosis, PCOD
- Ovarian cyst, tumour
- Patient using intrauterine contraceptive device.

A thorough clinical examination including general physical examination, gynaecological and systemic examination was carried out with special reference to thyroid dysfunction; in cases with a provisional diagnosis of AUB.

Patients were subjected to routine investigations like Hb, BT, CT and platelets (to rule out coagulation defects). All patients were subjected to T3,T4 and TSH estimation in their sera by Electro Chemiluminescence Labelled Antibody Immunoassay by Cobas e 411 machine. Normal serum concentration taken for standard references

- T3 - 0.85 - 2.02 ng/ml
- T4 - 5.14 - 14.1 μg/dl
- TSH - 0.27 - 4.2 μIU/ml

Ultrasoundography (USG - Abdomen and Pelvis with endometrial thickness) was done to rule out the structural causes associated with menstrual irregularities.

Statistical analysis

Frequency distribution tables were made. Based on thyroid dysfunction, the cases were categorised to 3 groups - hypothyroid, euthyroid and hyperthyroid.

Ethical considerations

The following ethical issues were considered for the study

- There was no physical harm for the participants as there was no intervention
- Written informed consent was obtained from all the participants.

Ethical clearance approval obtained from the institutions ethical committee.

RESULTS

Abnormal uterine bleeding is one of the most commonly encountered conditions in gynaecological practice.

Various parameters analyzed were

- Age
- Parity
- Menstrual irregularities
- Thyroid status
- Association of menstrual irregularities with thyroid dysfunction.
Majority patients belonged to age group between 41-50 years (45.9%) followed by age group of 31-40 years (34.1%). 12 patients belonged to age group 21-30 years. Least common age group was 15-20 years (5.9%).

Table 1: Distribution of patients according to age (N = 85).

| Age   | Valid Percent |
|-------|---------------|
| 15-20 | 5             | 5.9          |
| 21-30 | 12            | 14.1         |
| 31-40 | 29            | 34.1         |
| 41-50 | 39            | 45.9         |
| Total | 85            | 100          |

65.9% patients belonged to parity between 2 to 4 making it the most common parity group. 15.2% were nulliparous and 12 patients (14.6%) belonged to parity 1.

Table 2: Distribution of patients according to the parity (N = 85).

| Parity | Valid Percent |
|--------|---------------|
| Nullipara | 13 | 15.2       |
| P1     | 12 | 14.6       |
| P2-4   | 54 | 65.9       |
| P>4    | 6  | 7.3        |
| Total  | 85 | 100        |

55.3% patients presented with menorrhagia making it the most prevalent complaint in this study. Next most common complaint being oligomenorrhea accounts for 16.5% of cases. Polymenorrhea and polymenorrhagia were seen in 7 patients each. 10 patients had irregular bleeding pattern in the present study.

Table 3: Distribution of patients according to menstrual irregularities.

| Menstrual irregularity | Menstrual irregularity | Valid percent |
|------------------------|------------------------|---------------|
| Menorrhagia            | 47                     | 55.3          |
| Oligomenorrhea         | 14                     | 16.5          |
| Polyomenorrhagia       | 7                      | 8.2           |
| Polyomenorrhea         | 7                      | 8.2           |
| Irregular              | 10                     | 11.8          |
| Total                  | 85                     | 100           |

Figure 1: Bleeding patterns in thyroid abnormalities.

Table 5: Distribution of patients according to thyroid status in relation to bleeding pattern.

| Crosstab | Thyroid | Euthyroid | Hypothyroid | Hyperthyroid | Total |
|----------|---------|-----------|-------------|--------------|-------|
| Irregular| Count   | 9         | 0           | 1            | 10    |
| Menorrhagia| Count | 27       | 18          | 2            | 47    |
| Oligomenorrhea| Count | 9       | 3           | 2            | 14    |
| Polyomenorrhagia| Count | 6       | 1           | 0            | 7     |
| Polymenorrhea| Count | 5       | 2           | 0            | 7     |
| Total     | Count   | 56       | 24          | 5            | 85    |

Of the 85 patients studied with menstrual irregularities, 56 were euthyroid, 24 were hypothyroid and 5 were hyperthyroid. 29 out of 85 patients (34.11%) hence had thyroid abnormalities. Out of 24 hypothyroid patients, 18 (75%) were found to have menorrhagia making it the most common menstrual irregularity with
hypothyroidism. Hyperthyroidism – 2 patients had menorrhagia, 2 had oligomenorrhea and 1 patient had irregular bleeding pattern. Among 56 euthyroid patients, 27 patients had menorrhagia, 9 had oligomenorrhea, 6 patients had polymenorrha and 5 patients presented with polymenorrhea. 18 of the 47 patients with menorrhagia were found to be hypothyroid. Patients with hyperthyroidism - 2 had menorrhagia, 2 had oligomenorrhea and 1 patient had irregular bleeding pattern.

**DISCUSSION**

Thyroid disorders in general and hypothyroidism in particular is more commonly seen in women. Menarche, pubertal growth and development, menstrual cycles, fertility and fetal development, reproductive years and menopausal years are significantly influenced by the thyroid status of the women. Although hormonal and other biochemical aberrations are different in hypo and hyperthyroidism, both are associated with menstrual disturbances. In the present study, the most common age group with menstrual irregularities was 41-50 years with 45.9% of the cases. The next most common age group was 31-40 years with 34.1% of patients. The youngest patient was 15 years old in the study and the eldest 50 years old. Dass A, Chugh S in their study also had the most common age pattern as 41-50 years.6

**Table 6: Age pattern in menstrual disturbances.**

| Author                  | 20-30 years | 31-40 years | 41-50 years | >50 years |
|-------------------------|-------------|-------------|-------------|-----------|
| Dass and Chugh          | 20.5%       | 28.2%       | 32.5%       | 4.3%      |
| Devi and Sutaria        | 43.4%       | 33.6%       |             |           |
| Narula                  | 25.5%       | 32.8%       | 29.1%       | 7.0%      |
| Present study           | 14.1%       | 34.1%       | 45.9%       | 0.0%      |

Similar results were obtained in various other studies also. The most common parity group in our study was found to be P2-P4 with 65.9% of the patients. Second most common group was P1L1 with 14.6% of the patients. The commonest menstrual irregularity in the study was menorrhagia with 47 patients (55.3%). 14 patients (16.5%) came to the OPD with complaints of oligomenorrhea. 7 patients (8.2%) came with complaints of polymenorrhea and 7 (8.2%) with menorrhagia. 10 patients (11.8%) of patients had irregular bleeding pattern.

Nearly similar results were obtained in other studies also. Shapely in his study found 41% patients to have menorrhagia and 36% presented with polymenorrhea.7

28.2% of the patients were found to be hypothyroid, 5.9% hyperthyroid and 65.9% were euthyroid after biochemical evaluation.8,9

**Table 7: Menstrual disturbances in different studies.**

| Authors                  | Menorrhagia | Oligomenorrhea | Polymenorrha |
|--------------------------|-------------|----------------|--------------|
| Prasad et al             | 40%         | 15%            | 4%           |
| Ajmani sangita           | 50%         | 20%            | 16%          |
| Shapely                  | 41%         | -              | 36%          |
| Moghal                   | 54%         | -              | 36%          |
| Present study            | 55.3%       | 16.5%          | 8.2%         |

**Table 8: Thyroid disorders in different studies.**

| Study                    | Hypothyroid | Hyperthyroid |
|--------------------------|-------------|--------------|
| Kaur T et al             | 14%         | 1%           |
| Sharma N et al           | 19%         | 2%           |
| Padmaleela et al         | 18.1%       | 8.4%         |
| Jasmine et al            | 22%         | 2%           |
| Present study            | 28.2%       | 5.9%         |

Analysing the correlation of bleeding pattern with thyroid dysfunction, 18 of the 47 (38.3%) patients with menorrhagia had hypothyroidism.

2 patients with hyperthyroidism had menorrhagia as the chief complaint. Hence 42 (55%) of patients with menorrhagia had thyroid dysfunction. However, in the study conducted in Sindh Hyderabad, Pakistan, Simone found that the most common menstrual disturbance detected in thyroid patients was menorrhagia (40%).

**Table 9: Menorrhagia in hypothyroidism-different studies.**

| Authors                  | Menorrhagia (percentage) |
|--------------------------|--------------------------|
| Singh et al              | 44.4%                    |
| Doifode et al            | 63.3%                    |
| Simone et al             | 40%                      |
| Goldsmith et al          | 50%                      |
| Cecil et al              | 45%                      |
| Present study            | 38.3%                    |

Menorrhagia and metrorrhagia, alone or combined, constituted the abnormal menstrual pattern in 75% of the patients in a study conducted by Scott and Mussey. Cecil
reported an incidence of menorrhagia of 45% in patients with myxoedema.

In the present study, 2 (40%) of the hyperthyroid patients had oligomenorrhea, 2 (40%) had menorrhagia and 1 (10%) patient with irregular bleeding pattern.

| Study          | Oligomenorrhea (percentage) |
|----------------|----------------------------|
| Deshmukh PY et al | 66.6%                     |
| Present study     | 40%                       |

Table 10: Oligomenorrhea in hyperthyroidism-different studies.10

Discussing the treatment modalities, in a study conducted by Rosenfeld, menorrhagia was cured and did not recur in all patients with early hypothyroidism to whom L-thyroxine was given, with decline in TSH levels and rise in T3, T4 levels.

CONCLUSION

Prevalence of hypothyroidism was more common than hyperthyroidism in AUB cases Thyroid dysfunction is associated with menstrual disturbances which can get relieved with normalization of thyroid status, so thyroid assessment should be performed in all patients with menstrual irregularities. The menstrual abnormalities most commonly seen are menorrhagia, oligomenorrhea, polymenorrhoea and in majority of the cases menstrual irregularity precedes the occurrence of other clinical symptoms of thyroid dysfunction. Therefore, we summarize that any type of menstrual disorder should be considered as a possible presenting symptom of thyroid dysfunction and it may even indicate subclinical abnormality. These patients with thyroid abnormalities, if given medical line of management, it is possible to avoid unnecessary hormonal treatment and costly surgical interventions.

Funding: No funding sources
Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Bhavani N, Avanthi S, Aradhana G, Sangeeta C, Prasannakumar VS. A study of correlation between abnormal uterine bleeding and thyroid dysfunction. Int J Recent Trends Sci Tech. 2015;14(1):131-5.
2. Munro MG, Critchley HOD, Fraser I. The FIGO systems for nomenclature and classification of causes of abnormal uterine bleeding in the reproductive years who needs them. Am J Obstet Gynaecol. 2012;207(4):259-65.
3. Fraser IS, Langham S, Uhl-Hochgraebber K. Health-related quality of life and economic burden of abnormal uterine bleeding. Expert Rev Obstet Gynecol. 2009;4(2):179-89.
4. Khan A, Khan MM, Akhtar S. Thyroid disorders, etiology and prevalence. J Med Sci. 2002;2(2):89-94.
5. Rani AS, Rekha B, Reddy GA. Study of Hypothyroidism in Women with Abnormal Uterine Bleeding. IOSR-JDMS. 2016;15:12-18.
6. Das A, Chugh S. Dysfunctional uterine bleeding: a clinic-pathological study. J Obstet Gynecol India. 1964;14:343-7.
7. Shapely M, Jordon K, Croft PR. An epidemiological survey of symptoms of menstrual loss in the community. Br J Gen Pract. 2004;54(502):359-63.
8. Kaur T, Aseeja V, Sharma S. Thyroid Dysfunction in dysfunctional uterine bleeding. Obstet Gynaecol. 2011;2(9):WMC002235.
9. Sharma N, Sharma A. Thyroid profile in menstrual disorders. J K Sci. 2012;14(1):14-7.
10. Deshmukh PY, Boricha BG, Pandey A. The association of thyroid disorders with abnormal uterine bleeding. Int J Reprod Contracept Obstet Gynecol. 2015;4(3):701-8.

Cite this article as: Manjeera LM, Kaur P. Association of thyroid dysfunction with abnormal uterine bleeding. Int J Reprod Contracept Obstet Gynecol 2018;7:2388-92.