

Original Research Article

Thyroid Function Test (Serum T₃, T₄ and TSH Concentration) in Patients with Dysfunctional Uterine Bleeding in a Tertiary Care Hospital of Assam

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ABSTRACT

BACKGROUND: Dysfunctional Uterine Bleeding (DUB) forms a major portion of abnormal menstruation cases, being the principal diagnosis in at least 10% of all new outpatient department patients. The thyroid gland is known to play an important role in maintaining a healthy menstrual cycle. Clinical experiences show increased menstrual flow to be the most common reproductive system manifestation of hypothyroidism.

AIM: So, this study was undertaken to assess the thyroid status in apparently euthyroid patients with DUB and also to find out the correlation of thyroid dysfunction with the incidence of DUB.

METHODS: Fifty DUB patients were selected on the basis of clinical history, examination and relevant investigations. Equal numbers of age matched women with normal menstrual cycle were taken as controls. Thyroid hormones viz. TSH, Total T₃ and T₄ were estimated by radioimmunoassay. Statistical analysis of the data was performed by using Microsoft Excel software.

RESULTS: In our study, most common menstrual abnormality is menorrhagia (48%) followed by Metrorrhagia and Polymenorrhea (14% each). Hypothyroidism was more prevalent among cases (85.7%) as compared to controls (14.3%). In patients with menorrhagia, 33.3% of patients had hypothyroidism.

CONCLUSION: We suggest the need for Mandatory thyroid screening in all patients with menstrual irregularities as it will definitely help in early diagnosis and treatment of DUB patients.

Key words: Dysfunctional Uterine Bleeding (DUB), Menorrhagia, Hypothyroidism, Assam.

INTRODUCTION

Menstruation has been regarded as the purifying process of the female health system. So, any change in the volume or pattern of menstrual bleeding is considered as a cause of concern for health in women. This concern is heightened not only by the myths and taboos which surrounds the subject of menstruation but also by well orchestrated campaign for early detection of gynaecological malignancies. ⁽¹⁾ Menstrual

abnormalities in absence of any organic pelvic pathology forms a group of disorders known as Dysfunctional Uterine Bleeding (DUB) where there is a dysfunction at any level of the hypothalamo-pituitary-ovarian axis resulting in disturbance in the rhythmical production of hormones by the ovary. Novak defined it as - bleeding without a causative uterine lesion such as tumour infection or complications of pregnancy, although frequently there may

be associated cysts of the ovary. ⁽²⁾ It forms a major portion of abnormal menstruation cases, being the principal diagnosis in at least 10% of all new outpatient department patients. ⁽³⁾ The bleeding may be abnormal in frequency, amount or duration.

DUB is classified by the character of menstrual cycle as ovulatory or anovulatory. Out of all the aetiologies, age variations and clinical presentations like thyroid dysfunction (sub clinical or clinically evident) are becoming significantly important factors associated with DUB. The thyroid gland is known to play an important role in maintaining a healthy menstrual cycle. The impact of thyroid hormones has been reported to be both direct, through the presence of thyroid hormone receptors on the ovaries and indirectly through the impact on the secretion of sex hormone-binding globulin (SHBG), prolactin and gonadotropin releasing hormone (GnRH). Both hypo and hyperthyroidism are associated with a variety of changes in reproductive function including delayed onset of puberty, anovulatory cycles and abnormally high foetal wastage. ⁽⁴⁾ On the other hand, hyperthyroidism is most commonly associated with oligomenorrhea and hypomenorrhoea. ⁽⁵⁾ So manifestations of DUB can range in between both ends of the spectrum.

Abnormal menstruation, particularly heavy and prolonged menses are frequent debilitating conditions resulting in the need for repeated curettage and hysterectomy with its attendant morbidity and mortality. Hysterectomy, being a major surgery with its associated significant surgical and psychological complications is quite unacceptable to many women today. To avoid such complications and a major surgery at all, it is better to aim at finding out an etiological factor for these abnormal bleeding patterns and treat it conservatively. The introduction of serum tri-iodothyronine (T₃) and tetra-iodothyronine (T₄ or Thyroxine) and serum thyroid stimulating hormone (TSH) radioimmunoassays have increased the sensitivity and specificity of

thyroid function testing. The serum TSH assay has been shown to be a sensitive indicator of diminished thyroid functional reserve, since TSH levels become elevated before circulating serum thyroxine levels fall below the normal range. ⁽⁶⁾ So, we have undertaken this study to evaluate the thyroid status in apparently euthyroid patients with DUB coming to our hospital in upper Assam. We also want to find out the correlation of thyroid dysfunction with the incidence of DUB as no previous data is available regarding it in this eastern most part of the Indian subcontinent.

MATERIALS AND METHODS

The present study was undertaken in the Department of Biochemistry and Radioimmunoassay (RIA) Centre, Assam Medical College and Hospital (AMCH), Dibrugarh, Assam on newly diagnosed patients of DUB from July 2011 to June 2012. After obtaining approval from Institutional Human Ethics Committee, 50 patients were selected on the basis of clinical history, examination and relevant investigations. All the cases were in their reproductive age group i.e. between 15-45 years with menstrual abnormality in absence of any organic pelvic pathology, attending Gynaecology Out-patient Department or admitted in the Gynaecology ward of Assam Medical College and Hospital. Equal numbers of age matched women from similar socio-economic background with normal menstrual cycle were taken as controls. Both the cases and controls were apparently euthyroid. The menstrual abnormalities included in this study ranged from Metrorrhagia, Hypomenorrhoea, Menorrhagia, Oligomenorrhoea and Polymenorrhagia to Polymenorrhoea. All of them were clinically diagnosed and/or supported by Gynaecological investigation/histopathology. Women on IUCD or with organic lesion in genital tract like polyp, fibroid, blood dyscrasias etc. or with history of taking steroid medication were excluded from the study.

Selection Criteria:

The cases were selected as per the following criteria on a lottery basis:

1. Patients presenting with menstrual abnormalities in the Gynaecology Out-patient Department, Assam Medical College and Hospital, Dibrugarh, or who were admitted for its treatment were taken up for the study, after detailed history taking.
2. Patients of reproductive age group were studied. In our study, the age limit was taken from 15–45 years. All cases provisionally diagnosed to have dysfunctional uterine bleeding.
3. Cases where no abnormality could be detected by abdominal and pelvic examination as well as Ultrasonography were selected. All of them were clinically diagnosed and/or supported by Gynaecological investigation/histopathology
4. Since it is difficult to measure the menstrual blood loss accurately, the cases using more than three well soaked sanitary pads or menstrual bleeding associated with the passage of clots within 7 days of flow or prolongation of bleeding beyond 7 days with or without passage of clots was considered as menorrhagia for the purpose of the study
5. All parities were involved.
6. All of them were apparently euthyroid.
7. All patients had no history of medical disorders such as hypertension, diabetes mellitus.
8. All patients had no history of thyroid disorder or thyroid drug intake.

Exclusion Criteria:

1. Pregnancy and pregnancy related complications were excluded from the study.
2. Cases taking exogenous hormones, e.g. OCPs were excluded.
3. No case of post-menopausal bleeding or IUCD users were taken into account.

4. Patients presenting with amenorrhoea having definite cause in the pelvis, e.g. Ashermann's syndrome were excluded.
5. Patients using drugs like steroids, androgens, salicylates, phenytoin, furosemide, dopamine antithyroid drugs and lithium that decrease thyroid hormone concentration were excluded from the study.

Also patients on drugs that raise the thyroid hormone concentration like tamoxifen, amiodarone, propranolol, glucocorticoids, lithium and potassium iodide were exempted from the study.

Gynecological Examination:

Secondary sex character: breast pubic hair, axillary hair and signs of virilization, if any.

Abdominal Examination

Pelvic Examination: Inspection, Per Speculum, Per Vaginum, Per Rectum

Examination under anaesthesia for proper uterine cervix and vagina inspection (with prior informed consent of the guardian)

Investigations:

Blood: Hb in gms. TLC, DLC, ESR, Platelet count, Peripheral blood smear, BT, CT, Random blood sugar, S. creatinine

Urine Examination

Stool Examination

Mantoux test (1: 10,000)

Thyroid Profile (T₃, T₄, TSH)

Ultrasonography of Abdomen and Pelvis

D and C for Histopathological examination

Measurement of Thyroid hormones:

Blood samples were collected in vacutainers under all aseptic and antiseptic conditions and serum separated by centrifugation. Estimations of triiodothyronine (T₃) and Thyroxine (T₄) in serum were done by Radioimmunoassay Method in RIA Centre of AMCH. In this procedure, unlabelled endogenous T₃ or T₄ competes with radio-labelled T₃ or T₄ for the limited binding sites on the antibody made specifically for T₃ or T₄ respectively. Estimations of thyroid stimulating hormone (TSH) were also done here by

Immunoradiometric assay (IRMA) Method in antibody coated tube along with the complementary antibody labelled with ¹²⁵I using IRMA K-9 kit. (7) Statistical analysis of the data was performed by using Microsoft Excel software. A 'p' value of less than or equal to 0.05 was considered significant.

RESULTS

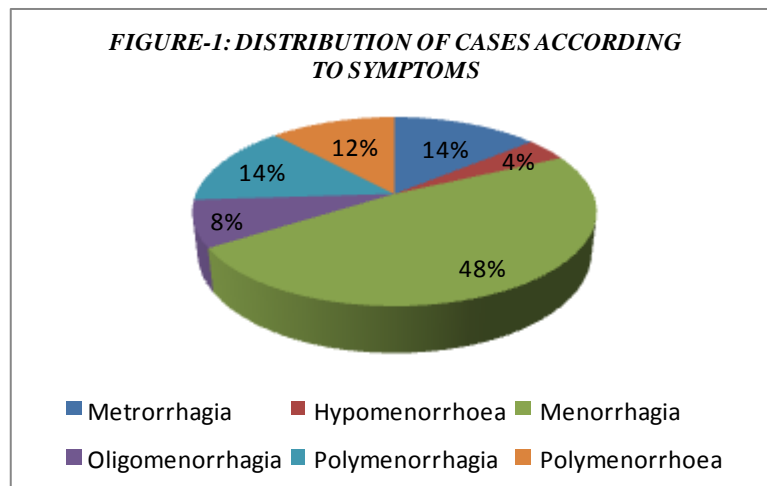
In our study, thyroid hormones of 50 cases and equal number of controls were analysed. The mean age of study population was 32.78±9.32 years with a range from 15 to 45 years. Maximum number of cases and controls i.e. 17 (34%) were seen in the age group of 31-40 years, followed by 14 cases

and controls in 21-30 years age group (Table.1).

Table-1 Distribution Of Cases And Controls According To Age

Age group (years)	Cases		Controls	
	No	Percentage	No	Percentage
≤20	9	18	7	14
21-30	14	28	17	34
31-40	17	34	18	36
≥41	10	20	8	16
Total	50		50	

The Fig.1 shows 50 cases that came with the complaint of different bleeding pattern, commonest being menorrhagia in 24 (48%) cases. After analyses of Serum TSH, T₃ and T₄ in both cases and controls, hypothyroid, euthyroid as well as hyperthyroid women were detected when both groups were taken together i.e. a total of 100 study subjects.



From Table.2 it was evident that the thyroid function was significantly associated with DUB. Hypothyroidism was more prevalent among cases 12 (85.7%) as compared to two controls (14.3%) which are statistically significant.

Table-2 Distribution Of Cases And Controls According To Thyroid Function

Thyroid function	Total	Cases		Controls	
		No.	Percentage	No.	Percentage
Hypothyroid	14	12	85.7	2	14.3
Euthyroid	85	38	44.7	47	55.3
Hyperthyroid	1	0	0	1	100
Total	100	50		50	

X²=8.31, degrees of freedom=1, p<0.01

Fig.2 shows the relationship of hypothyroidism, euthyroidism and

hyperthyroidism to the different bleeding patterns of clinically diagnosed cases of dysfunctional uterine bleeding (DUB). In patients with menorrhagia, 33.3% of patients had hypothyroidism and 66.7% of patients were euthyroid.

Table.3 shows the relation of serum TSH levels to different types of bleeding patterns where the most common bleeding patterns were Menorrhagia (41.2%) followed by Polymenorrhagia (17.6%). Likewise, it was seen that incidence of Menorrhagia was higher (≈45%) than other bleeding patterns where serum T₃ and T₄ concentrations were low.

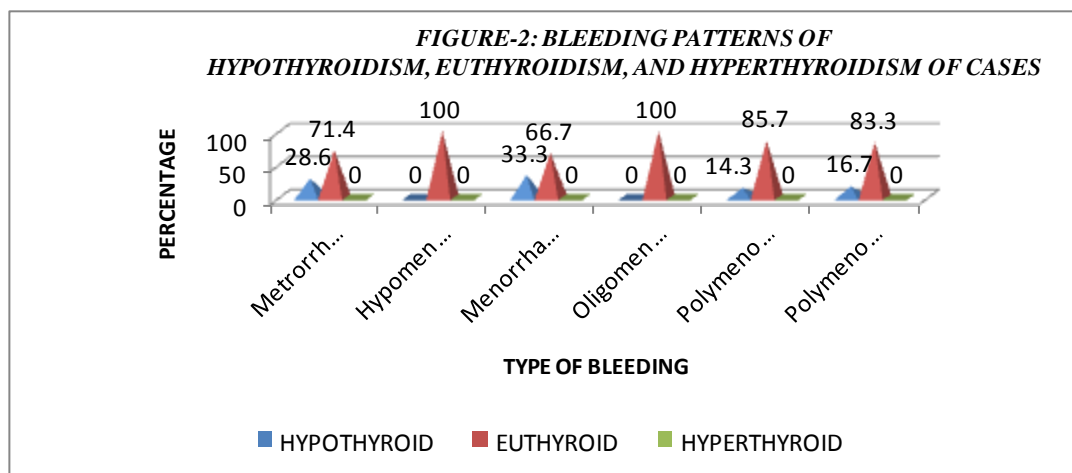


Table-3 TSH Levels And Different Bleeding Patterns Of The Cases

TSH Levels (μ IU/ml)	No. Of cases	Metrorrhagia		Hypomenorrhagia		Menorrhagia		Oligomenorrhagia		Polymenorrhagia		Polymenorrhagia	
		No	%	No	%	No	%	No	%	No	%	No	%
<0.5	4	1	25	0	0	2	50	1	25	0	0	0	0
0.5-4.5	34	4	11.8	2	5.9	14	41.2	3	8.8	6	17.6	5	14.7
4.51-7.0	10	2	20	0	0	7	70	0	0	1	10	0	0
>7.0	2	0	0	0	0	1	50	0	0	0	0	1	50
Total	50	7		2		24		4		7		6	

DISCUSSION

The present study revealed that thyroid hormone levels were altered in DUB patients. As per Table.1 the highest incidence was found in the 31-40 years age group (34%) followed by 28% in 21-30 years group. Doifode et al also reported maximum number of patients belonged to age group 31-40 years. (8) In the present study, 76% of the cases were parous and the commonest type of menstrual abnormality encountered was menorrhagia (48%). Das and Chugh reported the highest incidence in 41-50 years of age group which is 32.5% followed by 28.2% incidence in 31-40 years of age group. (9) Narula gave the highest incidence amongst the age group between 31-40 years (32.8%) followed by the next common age group of 41-50 years (29.1%). (10)

In the present study, 24% cases (12 cases out of 50 patients) with menstrual abnormality had an abnormal thyroid function test. All of them were hypothyroid. It was seen that hypothyroidism was more prevalent among cases [12 out of 14 hypothyroid (85.7%)] as compared to two controls out of 14 (14.3%). Sharma U *et al* and Chakraborti J *et al* have found similar

incidences in their respective studies. (11,12)

On the contrary, Lahiri *et al* reported very high incidence of menstrual abnormality in 53% cases of hypothyroidism. (13) Gowri M *et al* found hypothyroidism in 17.6% cases but reported oligomenorrhagia as the commonest abnormality. (14) In the present study there were no cases of hyperthyroidism with menstrual abnormality. This low incidence of cases with hyperthyroidism may be because in this part of the country, hyperthyroidism is not as common as hypothyroidism. Also patients with hyperthyroidism present more with other symptoms of hyperthyroidism to a physician than to a gynaecologist. In our study, menorrhagia was the predominant abnormality (33.3%) in cases with hypothyroidism, followed by metrorrhagia (28.6%). So, menorrhagia and metrorrhagia combined constituted 61.9% of the abnormal pattern and no case of amenorrhoea was reported. Scott and Mussey also reported menorrhagia and metrorrhagia combined as the most common irregularity in 75% cases with hypothyroidism. (15) Thus our findings are in accordance with these studies. As per our findings, menorrhagia is more common in

hypothyroidism. Similar findings were reported in studies where they demonstrated that menstrual irregularities were significantly more frequent in hypo or hyperthyroidism as compared to control cases. They found that polymenorrhea is common in hypothyroidism and hypomenorrhoea is common in hyperthyroidism. (16,17)

The menstrual irregularities and bleeding problems in hypothyroidism are attributed to multiple factors like high TSH levels inhibit or alter GnRH pulses from hypothalamus causing decrease in pituitary gonadotropin secretion or defect in LH secretion with persistent FSH secretion. This results in chronic anovulation in hypothyroidism or luteal phase defects in less severe cases. Anovulations resulting from either Grave's disease or myxoedema disturb the menstrual cycle. (18)

CONCLUSION

The study reveals that in patients with DUB, hypothyroidism and menorrhagia predominate as presenting sign and symptoms. It can be concluded that DUB is associated with thyroid dysfunctions which can be relieved by normalization of thyroid status. So, thyroid assessment should be routinely performed in all patients with menstrual irregularities as it is seen that menstrual irregularity precedes the occurrence of other clinical symptoms of thyroid dysfunction. This will help in early diagnosis and treatment of DUB patients and definitely will have an impact on reduction in incidence of hysterectomy.

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Contribution of authors: I (We) declare that this work was done by the author(s) named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

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