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Original Article

Evaluation of Thyroid Dysfunction in Abnormal Uterine Bleeding with Ovarian Dysfunction (AUB-O)

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Abstract

Introduction: Abnormal uterine bleeding with ovarian dysfunction (AUB-O) is one of the most frequently encountered conditions in gynecology and defined as an abnormal bleeding from the uterus in the absence of organic disease of genital tract and demonstrable extragenital cause.

Aims and Objectives: The objectives of the study were to study the menstrual pattern in patients with thyroid dysfunction and to study the thyroid dysfunction from puberty to premenopausal age group in AUB-O.

Results: AUB-O is one of the most frequently encountered conditions in gynecological practice which will give a descriptive analysis of the age distribution, the parity distribution, symptomatic distribution of AUB-O, and its association with thyroid dysfunction.

Conclusion: Our study concludes that thyroid dysfunction should be considered as an important etiological factor for menstrual abnormality. Thus, biochemical evaluation of T3, T4, and thyroid-stimulating hormone estimations should be made mandatory in AUB-O cases to detect apparent and occult thyroid dysfunction.

Key words: Abnormal uterine bleeding with ovarian dysfunction, Hyperthyroidism, Hypothyroidism

INTRODUCTION

Abnormal uterine bleeding with ovarian dysfunction (AUB-O) is one of the most frequently encountered conditions in gynecology and defined as an abnormal bleeding from the uterus in the absence of organic disease of genital tract and demonstrable extragenital cause.[1]

Regular cyclic menstruation results from the choreographed relationship between the endometrium and its regulating factors, changes in either of these frequently result in abnormal bleeding.[2] AUB-O affects 20–30% of women[3] and accounts for 12% of the gynecological-related complaints.[4] Thyroid hormones play an important role in normal reproductive function, both through direct effects on the ovaries and indirectly by interacting with sex hormone-binding protein.[5]

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It is recognized universally that menstrual disturbances may accompany clinical alterations in thyroid function, and every clinician has encountered altered menstrual patterns among women suffering from hypothyroidism and hyperthyroidism.[6]

Diseases of thyroid gland are among the most prevalent disorders worldwide second only to diabetes.[7] Both hypo- and hyperthyroidism are associated with a variety of changes in reproductive function including delayed onset of puberty, anovulatory cycles, and abnormally high fetal wastage.[8]

Although the occurrence of menstrual disturbances in hypothyroid woman has been documented, the number of hypothyroid patients originally requiring treatment for menorrhagia has not been carefully elicited.[9]

Danese *et al.* recommended that hypothyroidism is frequent enough to warrant consideration in most older woman, justifying screening even in asymptomatic older women.

The introduction of serum thyroxine and serum thyroid-stimulating hormone (TSH) radioimmunoassay has increased the sensitivity and specificity of thyroid function testing. The serum TSH assay has been shown to be a

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sensitive indicator of diminished thyroid functional reserve since TSH levels become elevated before circulating serum thyroxine levels fall below the normal range.

Hence, this study is to evaluate the thyroid dysfunction in patients having abnormal menstrual bleeding from puberty to premenopausal age groups which will be justifiable and will help in further management of AUB-O.

Aims and Objectives

The objectives of the study were as follows:

1. To study the menstrual pattern in patients with thyroid dysfunction
2. To study the thyroid dysfunction from puberty to premenopausal age group in AUB-O.

MATERIALS AND METHODS

The present study aimed to establish the role of thyroid dysfunctions in relation to menstrual disturbances.

This study was carried out in the Department of Obstetrics and Gynaecology in Chanda Kantha Maternity Hospital, Warangal. One hundred women who were given clinically the diagnosis as AUB-O during the period from June 2018 to May 2019 were selected for the study.

Criteria for the Selection of Cases

1. All cases diagnosed to have AUB-O from puberty to premenopausal age groups
2. All patients had major complaint of menstrual disturbances, for example, menorrhagia, polymenorrhea, polymenorrhagia, metropathia hemorrhagica, metrorrhagia, oligomenorrhea, and hypomenorrhea
3. Patients who were on drug or hormones, intrauterine contraceptive device (IUCD) users, with overt clinical symptoms of thyroid dysfunction, and history of bleeding disorder were excluded from the study.

Method

- A detailed history was obtained with special relevance to age, bleeding pattern
- Onset, duration, amount of bleeding, and complaints related to thyroid dysfunction were noted in detail
- A thorough clinical examination including general physical examination, neck examination, gynecological, and systemic examination was carried out, with special reference to thyroid dysfunction; a clinical diagnosis of AUB-O was attained
- Patients with pre-existing thyroid disorders were excluded from the study
- All these patients were subjected to routine investigations such as hemoglobin percentage, blood counts, urine examination for albumin, sugar, microscopy, bleeding time, and clotting time (to rule out coagulation defect)
- Then, all patients were subjected for T3, T4, and TSH estimation in their sera.

T3, T4, and TSH were assayed by enzyme-linked immunosorbent assay method.

These tests were done in random blood samples as the variation in TSH secretion due to circadian rhythm with a peak at 01:00 h and nadir at 11:00 h is small and does not influence the timing of blood sampling.

The following were noted.

- Level of T3
- Level of T4
- Level of TSH.

Patients were then grouped into four categories:

- Euthyroid
- Subclinical hypothyroid
- Hypothyroid
- Hyperthyroid.

Patients found to have thyroid dysfunction were further managed with the help of physician.

RESULTS

AUB-O is one of the most frequently encountered conditions in gynecological practice.

The following few pages, there are tables which will give a descriptive analysis of the age distribution, the parity distribution, symptomatic distribution of AUB-O, and its association with thyroid dysfunction.

The total number of patients studied was 100 from June 2018 to May 2019.

According to Table 1, maximum number of patients in the study group belongs to the age group of 31–40 years – 37%. Between the age group of 41 and 50 years, 9 cases were seen (9%).

Table 1: Distribution of patients according to age

Age group (years)	Number of cases	Percentage
<20	25	25
21–30	29	29
31–40	37	37
41–50	9	9
Total	100	100

The above column shows relationship of AUB-O with parity. Among 100 cases of AUB-O, 22 patients were unmarried and nulliparas were 8. Eighteen patients were para 3. Nine patients were para 4. Two patients were para 5. In this study, maximum number of patients were para 2 (27%) and minimum number of patient presenting as clinical AUB-O cases were of para 5 [Table 2].

Table 3 shows the relationship of thyroid dysfunction to different age groups. Thyroid dysfunction was most common in the age group between 31 and 40 years – 47.82% followed with 26.08% among patients between 21 and 30 years. About 17.39% of patients of age group <20 years showed thyroid dysfunction.

Thyroid dysfunction was least common in patients age 41–50 years – 8.69%.

This shows that thyroid dysfunction becomes common in reproductive age group.

The difference in thyroid functioning in individual age groups is not statistically significant ($P = 0.65$ [NS], NS – not significant).

Table 2: Distribution of patients according to parity

Parity	Number of patients	Percentage
Unmarried	22	22
0	8	8
1	14	14
2	27	27
3	18	18
4	9	9
5	2	2
100	100	100

Table 4 shows how thyroid dysfunction which can be hypothyroidism, subclinical hypothyroidism, or hyperthyroidism is related to various types of bleeding abnormalities. Thyroid dysfunction was most common in patients with menorrhagia – 43.47% followed by metropathia hemorrhagica – 21.73% and in patients with oligomenorrhea – 17.39%.

Patients with polymenorrhagia had thyroid dysfunction in 8.69% of cases. Thyroid dysfunction was least common in patients with polymenorrhea (8.69%) and absent in patients with metrorrhagia and hypomenorrhea.

Patients who were hyperthyroid were exclusively presenting as oligomenorrhea. Subclinical hypothyroid and hypothyroid patients were presenting menorrhagia as their most common bleeding pattern.

The difference in thyroid functioning in individual type of AUB-O is not statistically significant ($P = 0.58$ [NS], NS – not significant).

Table 5 shows the relation of TSH levels to different types of bleeding patterns. Patients with TSH levels <0.5 all of them presented with symptoms of oligomenorrhea.

Patients with TSH levels moderately elevated 5.1 and above, as seen in subclinical hypothyroidism and hypothyroid, 47.61% of patients presented with menorrhagia, 9.52% of patients presented with polymenorrhea, polymenorrhagia, and oligomenorrhea each, and 23.8% presented with metropathia hemorrhagica. In this group, maximum number of patients presented with menorrhagia. Hence, in this table, it is seen that oligomenorrhea was seen in patients

Table 3: Thyroid dysfunction in different age groups

Age	Number of cases	Euthyroid	Hypothyroid	Sub-hypothyroid	Hyperthyroid	Total thyroid dysfunction	Percentage
<20	25	21	2	2	0	4	17.39
21–30	29	23	3	3	0	6	26.08
31–40	37	26	4	5	2	11	47.82
41–50	9	7	2	0	0	2	8.69
Total	100	77	11	10	2	23	

Table 4: Bleeding pattern and thyroid dysfunction

Types of bleeding	Number of cases	Euthyroid	Hypothyroid	Sub-hypothyroid	Hyperthyroid	Total TDF	Percentage
Metropathia	13	8	3	2	0	5	21.73
Hypomenorrhea	5	5	0	0	0	0	0
Menorrhagia	34	24	5	5	0	10	43.47
Metrorrhagia	5	5	0	0	0	0	0
Oligomenorrhea	20	16	2	0	2	4	17.39
Polymenorrhagia	11	9	1	1	0	2	8.69
Polymenorrhea	12	10	0	2	0	2	8.69
Total	100	77	11	10	2	23	

TDF: Testis-determining factor

Table 5: TSH levels and different bleeding patterns

TSH level	Number of cases	Metropathia hemorrhagica		Hypomenorrhea		Menorrhagia		Metrorrhagia		Oligomenorrhea		Polymenorrhagia		Polymenorrhea	
<0.5	2	0	-	-	-	-	-	-	-	2	100%	-	-	-	-
0.5–5 (normal range)	77	8	-	5	-	24	-	5	-	16	-	9	-	10	-
5.1 and above	21	5	23.8%	0	0	10	47.61%	0	0	2	9.52%	2	9.52%	2	9.52%

TSH: Thyroid-stimulating hormone

with TSH value <0.5. On the other hand, menorrhagia was mostly seen in patients with TSH value (5.1 and above) moderately elevated.

TSH normal range is 0.5–5 IU/ml.

Table 6 shows the relationship of T3 levels to different types of bleeding pattern. Patients with T3 levels <0.5 had metropathia hemorrhagica and menorrhagia in 27.27% of the patients. About 18.18% of patients had oligomenorrhea and polymenorrhea.

Where the T3 levels >1.85, all patients had oligomenorrhea.

Only 13% of the total number of patients showed abnormal T3 levels compared to 23% of patients who showed abnormal TSH levels.

T3 normal range is 0.52–1.85 ng/dl.

Table 7 shows relationship of T4 levels to different types of bleeding pattern.

Patients with T4 level <4.5, menorrhagia (40%) was present predominantly followed by metropathia hemorrhagica and oligomenorrhea (20%) each.

Patients with T4 levels >12 had predominantly oligomenorrhea as their complaints (100%).

Only 11% of the total number of patients showed abnormal T4 levels compared to 23% of patients who showed abnormal TSH levels.

T4 normal range is 4.5–11.6 μg/dl.

DISCUSSION

Thyroid dysfunction is marked by large number of menstrual aberrations. In the present study, patients were taken from all age groups which included <20 years, 21–30 years, 31–40 years, and 41–50 years and maximum number of patients were in the age group of 31–40 years. In a study by Doifode *et al.*, also maximum number of patients were in the age group of 31–40 years.

In the present study, patients with clinical signs and symptoms of thyroid dysfunction were excluded, but in author's study, all patients with menstrual aberrations irrespective of the presence of signs and symptoms of thyroid dysfunction were included in the study.

Patients with organic lesions of genital tract, drug (hormone) intake, bleeding disorders, and IUCD users

were excluded from the present study and also from the author's study (Difode, Fernandes).

The present study groups ranged patients according to parity as unmarried, nullipara, para 1, para 2, para 3, para 4, para 5, and above. Similarly, the author's study had also grouped parity into unmarried, nullipara, para 1, para 2, para 3, para 4, and more.

Table 8 compares the relationship of parity with thyroid dysfunction among patients with AUB-O (diagnosed clinically) in the present study and in the author's study.

In the present study, 17.39% of unmarried patients had thyroid dysfunction and in Doifode *et al.* study (2001), 15% of unmarried patients had thyroid dysfunction. In the present study, thyroid dysfunction was 4.34% among nulliparous patients as compared to the author's study which showed 6.67%. In the present study, patients with para 1, only 17.39% of them had thyroid dysfunction, but in the author's study, thyroid dysfunction was present in 33.33% of patients with para 1.

Maximum number of patients with thyroid dysfunction were para 2 (39.13%) in the present study as compared to the author's study, where maximum number of patients with thyroid dysfunction belonged to para 1.

Thyroid dysfunction was most common in the age group (31–40 years), both in the present study and also in the author's study. About 17.39% of patients with thyroid dysfunction were from the group of patients with AUB-O who were <20 years in the present study as compared to only 11.67% of patients with thyroid dysfunction were from this group. In a study (Doifode *et al.*), 23.33% of patients with thyroid dysfunction belonged to the age group of above 40 years in the author's study as compared to 8.64% of patients with thyroid dysfunction belonged to this age group (above 40) in the present study.

In the present study, 100 cases were taken with the complaint of abnormal menstruation. Cases of metropathia hemorrhagica, menorrhagia, polymenorrhagia, polymenorrhea, metrorrhagia, oligomenorrhea, and hypomenorrhea were included in this study.

In the author's study, 213 cases of clinically diagnosed AUB-O were taken. Patients with oligomenorrhea, hypomenorrhea, and polymenorrhea were excluded in the author's study. In both the studies, the most common complaint was menorrhagia.

In the study (Doifode *et al.*), 60 patients out of 213 patients showed their thyroid dysfunction as hypothyroidism (either subclinical or profound), the author's study had no case of hyperthyroidism.

Table 6: T3 levels and different bleeding patterns

T3 level	Number of cases	Metropathia	Hypomenorrhea	Menorrhagia	Metrorrhagia	Oligomenorrhea	Polymenorrhagia	Polymenorrhea
<0.5	11	3	0	3	0	2	1	2
0.5–1.85	87	10	5	29	5	16	10	12
>1.85	2	0	0	0	0	2	0	0

Table 7: T4 levels and different types of bleeding patterns

T4 levels	Number of cases	Metropathia	Hypomenorrhea	Menorrhagia	Metrorrhagia	Oligomenorrhea	Polymenorrhagia	Polymenorrhea
<4.5	10	2	0	4	0	2	1	1
4.6–12 (normal range)	89	11	5	28	5	17	10	13
>12	1	0	0	0	0	1	0	0

Table 8: Thyroid dysfunction in relation to parity

Para	Present study		Author's study Doifode *et al.*[29]	
	Number of patients with TDF	Percentage	Number of patients with TDF	Percentage
Unmarried	4	17.39	9	15
0	1	4.34	4	6.67
1	4	17.39	20	33.33
2	9	39.13	9	15
3	4	17.39	12	20
4 and above	1	4.34	6	10

TDF: Testis-determining factor

Even in the present study, 23 patients out of 100 patients showed thyroid dysfunction. Twenty-one patients were hypothyroid either subclinical or profound and two patients were hyperthyroid.

In the present study, 76.19% of patients were hypothyroid and 100% of patients were hyperthyroid in multipara.

In Sharma *et al.* study (2012), 81.81% of patients were hypothyroid and 85.71% were hyperthyroid in multipara.

In Sharma *et al.* study, 64% of patients were euthyroid, 22% of patients were hypothyroid, and 14% were hyperthyroid.

In Kour *et al.* study, 85% of patients were euthyroid, 14% were hypothyroid, and 1% of patients were hyperthyroid.

In the author's study, patients with clinical signs and symptoms of hypothyroidism were also included in the study, whereas in the present study, patient with clinically diagnosed AUB-O with any signs or symptoms of hypothyroidism were excluded from the study.

In the present study, hypothyroidism was the most common (i.e., 21%) thyroid dysfunction seen in patient with all the seven different types of menstrual disturbances.

The type of menstrual abnormality commonly seen in hypothyroidism was menorrhagia (63.33%) in the author's study. Menorrhagia was the most common menstrual abnormality even in the present study, i.e., 47.61%. Polymenorrhagia was the next common menstrual abnormality, i.e., 23.33% in the author's study. Metropathia hemorrhagica was the next common menstrual abnormality, i.e., 23.8% in the present study.

The author's study had excluded cases of polymenorrhea. In the present study, polymenorrhea was present in 9.52% of hypothyroid cases.

The author had excluded cases of oligomenorrhea. In the present study, oligomenorrhea was the menstrual pattern in 9.52% of hypothyroid patient.

In Kour *et al.* study, oligomenorrhea was present in 21.4% of hypothyroid patients.

Subclinical hypothyroidism is diagnosed in cases with normal levels of T3 and T4 (low normal levels) and raised TSH levels. In the table below, cases with menorrhagia who were having subclinical hypothyroidism in the present study were compared with the author's study (Douglas *et al.*, 1989).

Subclinical hypothyroidism was seen in 22.3% of cases with menorrhagia in the author's study (Douglas *et al.*, 1989).

Similarly, in the present study, subclinical hypothyroidism was seen in 23.8% of cases with menorrhagia. The incidence of subclinical hypothyroidism was similar in the present study and in the author's study (Douglas *et al.*, 1989).

In the present study, 9 cases of menorrhagia in the age group of <20 years were studied, of which 1 case had hypothyroidism. In the author's study (Mukherji *et al.*, 1986), 70 cases of menorrhagia were studied <20 years, of which 5 patients were hypothyroid.

In the present study, hypothyroidism was seen in menorrhagia patients (<20 years) in 11% of cases. In the author's study, hypothyroidism was seen in 7.14% of menorrhagia patients <20 years.

In the present study, there were total 20 cases of oligomenorrhea, in which 6 cases were from patients <20 years, 8 cases were patients between 21 and 30 years, 5 cases were patients between 31 and 40 years, and 1 case was patient above 40 years.

In the author's study (Mukherjee *et al.*, 1985), 10 cases of oligomenorrhea were taken, age ranging between 25 and 39 years, mean age being 31.7 ± 2.8 years.

In the author's study, there were no cases among oligomenorrhea patients who had hyperthyroidism. In the present study, 10% of oligomenorrheic patients were showing hyperthyroidism and 10% were having hypothyroidism. Total patients show that thyroid dysfunction in the present study is 20% and in the author's study is 80%.

In the author's study, patients with oligomenorrhea and thyroid dysfunction showed 63.6% of hyperthyroidism and 36.3% of hypothyroidism.

In the present study, patients with oligomenorrhea and thyroid dysfunction showed 50% of hyperthyroid cases and 50% of hypothyroid cases. In the present study, hyperthyroidism was seen only in the cases of oligomenorrhea.

Hence, in both the present study and author's study (Singh *et al.*, 1990), oligomenorrhea was the most common menstrual aberration among hyperthyroid patients.

CONCLUSION

Our study concludes that thyroid dysfunction should be considered as an important etiological factor for menstrual abnormality.

Thus, biochemical evaluation of T3, T4, and TSH estimations should be made mandatory in AUB-O cases to detect apparent and occult thyroid dysfunction.

These patients with thyroid dysfunction if given medical treatment avoid necessity of hormonal treatment or surgical intervention.

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