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Original Research Article

Thyroid profile in women with menstrual disorders

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ABSTRACT

Background: Thyroid dysfunction influences both menstrual flow and fertility, likely through changes in sex hormone levels, gonadotrophin release and possibly ovarian function. Objectives of this work were to study thyroid related complaints and thyroid function tests in patients with menstrual irregularities like menorrhagia, oligomenorrhoea, amenorrhoea, hypomenorrhoea and ploymenorrhoea, to study menstrual patterns in women with diagnosed thyroid disease-hypothyroidism/hyperthyroidism and to study changes in menstrual patterns, if any in these patients during the course of treatment of thyroid disease, who receive correct treatment

Methods: This study was conducted in the Department of Obstetrics and Gynecology in Government L.D. Hospital, Government Medical College, Srinagar during the period from 2006 to 2007. There were two groups under which the study was conducted. Group A: Seventy-five patients of DUB from Department of Gynecology in reproductive age group (15-45 years) presenting with menstrual irregularities like menorrhagia, oligomenorrhoea, amenorrhoea, hypomenorrhoea and ploymenorrhoea were studied for thyroid profile. Group B comprised of 25 patients including already diagnosed 17 hypothyroid and 8 hyperthyroid patients. The study protocol included thorough history taking, general physical examination, meticulous per speculum and pelvic examination and routine investigations like Hb, BT, CT, TLC, DLC, Platelet count and ABO-Rh in all patients, Serum T3, T4, TSH estimation.

Results: Most of the patients were in 35-45 years age group. Prevalence of infertility was more in hypothyroid group. 22.66% patients with DUB were detected as hypothyroid where as 13.33% patients were detected as hyperthyroid.

Conclusions: Thyroid function tests, many of which are sensitive radioimmunoassay, radiometric assays and even new chemiluminescence method, which can detect minute changes in hormone levels must be done in women presenting with menstrual disorders.

Keywords: Menstrual disorders, Thyroid profile, Women

INTRODUCTION

Thyroid dysfunction influences both menstrual flow and fertility, likely through changes in sex hormone levels, gonadotrophin release and possibly ovarian function. Similarly, alterations in reproductive physiology can modulate thyroid function.[1] The relation of thyroid gland, pituitary gland and ovary is complex. The thyroid gland is necessary for the suppressive effect of oestrogen upon FSH.[2] In the menstrual abnormalities associated with hyperthyroidism data suggests that there is a decrease in the FSH content and increase in the LH content of the pituitary gland which may be the mechanism of the amenorrhoea in hyperthyroidism[2]. Appropriate ratio of FSH and LH is essential for the maturation of a follicle.[3] Oestrogen exerts a thyrotropic effect recognizable by the

resulting proliferation of the epithelium of the thyroid follicles.

Thyroid hyperfunction would seem to be necessary prerequisite for normal pubertal development considering that both cretins and patients with myxedema show retarded puberty and occasionally essential ammenorrhoea. Prepubertal and pubertal thyroid hyperfunction is therefore believed to be aimed not only at stimulating sexual maturation but probably also at contributing towards the somatic development of the individual.[4] During the reproductive period, hypothyroidism (mild and overt) can cause infertility by producing menstrual irregularities, anovulatory cycles and luteal phase dysfunction, changes that are typically reversible with thyroid hormone replacement. Unlike in hypothyroidism, mild to moderately thyrotoxic women remain ovulatory and not necessarily infertile.[5] However, severe thyrotoxicosis causes oligomenorrhoea and amenorrhoea and increases the risk of spontaneous miscarriage.[6]

Recent observations suggest that any type of menstrual irregularity can occur with either hypo or hyperfunction of the thyroid. The menstrual symptoms may be due to anovulation and other ovarian under function occurring in thyroid disorders. Clinical experience shows increased menstrual flow to be the most common reproductive system manifestation of established hypothyroidism. Urinary pregnanetriol levels are low which suggest failure of LH production and ovulation and resultant menorrhagia. In later stages, secondary depression of pituitary occur leading to ovarian atrophy and amenorrhoea. Also rise in TRH levels subsequent to primary hypothyroidism lead to increase in prolactin secretion which may inhibit gonadotrophins leading to amenorrhoea. Thyrotoxicosis, on the other hand manifests chiefly with hypomenorrhoea. Cycles may be shortened or prolonged and ultimately amenorrhoea develops.

METHODS

This study was conducted in the Department of Obstetrics and Gynaecology in Govt. L.D. Hospital, Government Medical College, Srinagar during the period from 2006 to 2007. There were two groups under which the study was conducted.

Group A

Seventy-five patients of DUB from Department of Gynaecology in reproductive age group (15-45 years) presenting with menstrual irregularities like menorrhagia, oligomenorrhoea, amenorrhoea, hypomenorrhoea and ploymenorrhoea were studied for thyroid profile. For convenience these irregularities were clubbed in two groups, one included patients with menorrhagia/polymenorrhoea and second with oligomenorrhoea/amenorrhoea/hypomenorrhoea. The study protocol included thorough history taking, general physical examination, meticulous per speculum and pelvic examination and routine investigations like Hb, BT, CT, TLC, DLC, Platelet count and ABO-Rh in all patients, Serum T3, T4, TSH estimation, special investigations, wherever required. Exclusion criteria for group A

- Patients with organic lesions of the genital tract.
- Patients on drugs or hormones intake, which can alter menstrual cycles.
- Patients with bleeding disorders.
- IUCD users.

Group B

Comprised of 25 patients including already diagnosed 17 hypothyroid and 8 hyperthyroid patients. The study protocol included detailed history taking with emphasis on age, parity, infertility and menstrual disorder, evaluation by pelvic examination along with general physical examination of those with menstrual complaints, routine investigations like Hb, BT, CT, TLC, DLC, Platelet count and ABO-Rh in all. Serum T3, T4, TSH were measured by ECLIA (Electrochemiluminescent Immuno Assay) Method. The reference values used in our study were

- Serum levels of T3-0.8-2.1 ng/ml.
- Serum levels of T4-5.0-14.1 ug/dl
- Serum levels of TSH-0.2-4.3 uIU/ml.

RESULTS

All patients in menorrhagia group were anaemic with mild anaemia in 41.3%, moderate anaemia in 46.55% and severe anaemia in 12.06%.

Table 1: Age wise distribution of menstrual irregularities (Group-A).

Menstrual group	Age group		
	15-24 yrs	25-34 yrs	35-45 yrs
	No. of cases (%)	No. of cases (%)	No. of cases (%)
Menorrhagia, polymenorrhoea group, n=58	6 (8%)	15 (20%)	37 (49.33%)
Oligomenorrhoea, hypomenorrhoea, amenorrhoea group, n=17	8 (10.66%)	6 (8%)	3 (4%)

BT, CT, TLC, Platelet count of all patients with DUB were in normal range.

Of the 6 babies who required immediate resusucitation, one expired in immediate neonatal period due to birth asphyxia (intrapartum fetal distress at 32 weeks in

woman with severe preeclampsia), one expired after 10 days due to metabolic complications and the rest four survived.

Table 2: Thyroid dysfunction wise distribution of patients with menstrual disorders in DUB (Group A).

Study group (n=75)	No. of cases (%)
Detected hypothyroid	17 (22.66%)
Detected hypothyroid	10 (13.33%)
Detected euthyroid	48 (64%)

All menstrual irregularities were more common in 35-45 years age group in both hypothyroidism and hyperthyroidism.

Table 3: Distribution of signs and symptoms of thyroid dysfunction in DUB (Group A).

Signs and symptoms of thyroid dysfunction	No. of cases (%)
Fatigue	36 (48%)
Heat intolerance	9 (12%)
Cold intolerance	12 (16%)
Palpitations	12 (16%)
Weight loss	4 (5.33%)
Goitre	5 (6.66%)
Obesity	12 (16%)
Hypertension	15 (20%)
Pallor	45 (60%)
Edema	6 (8%)
Tachycardia	12 (16%)
Delayed tendon reflex	4 (5.33%)
Eye signs	3 (4%)
Dry skin and hair loss	9 (12%)

Table 4: Distribution of signs and symptoms of thyroid dysfunction in hypothyroid cases (Group A).

Signs and symptoms of thyroid dysfunction	Detected hypothyroid	Detected hyperthyroid
Fatigue	100%	100%
Heat intolerance	5.8%	60%
Cold intolerance	47%	0%
Palpitations	17.6%	60%
Weight loss	0%	40%
Goitre	11.7%	30%
Obesity	52.9%	30%
Hypertension	47%	60%
Pallor	100%	60%
Edema	35%	0%
Tachycardia	17.6%	80%
Delayed tendon reflex	23%	0%
Eye signs	0%	10%
Dry skin and hair loss	35%	0%

Table 5: T3, T4, TSH values observed in menorrhagia polymenorrhoea, n=58 (Group A).

	Raised levels	Normal	Decreased level
T3	6 (10.34%)	44 (75.86%)	8 (13.79%)
T4	4 (6.89%)	49 (84.48%)	5 (8.62%)
TSH	14 (24.13%)	39 (67.24%)	5 (8.62%)

Table 6: T3, T4, TSH values observed in menorrhagia polymenorrhoea, n=58 (Group A).

	Raised levels	Normal	Decreased level
T3	3 (17.64%)	14 (82.35%)	0
T4	0	17 (100%)	0
TSH	2 (11.76%)	11 (64.70%)	4 (23.52%)

Most of hypothyroid and hyperthyroid women were multiparous (72%), 16% were para 1, 4% were infertile and 8% were unmarried girls.

Table 7: Age distribution of hypothyroid and hyperthyroid cases studied (Group B) n=25.

Age group (in years)	Hypothyroid N=17	Hyperthyroid N=8
15-24	2 (11.76%)	1 (12.50%)
25-34	4 (23.52%)	2 (25%)
35-45	11 (64.70%)	5 (62.50%)

In hypothyroid group fatigue was chief symptom in 64.70%, cold intolerance in 35.29%, weight gain in 35.29%, hoarseness in 23.52%, palpitation in 52.94%, hair loss in 29.41, while 5.88% has heat tolerance. In hyperthyroid group 62.5% had palpitation, 37.50% each had fatigue and heat intolerance, 25% each had weight loss and hair loss.

Table 8: Menstrual disorders in hypothyroid and hyperthyroid patients (Group B).

Observed menstrual irregularity	Hypothyroid N=17	Hyperthyroid N=8
Normal	8 (47%)	3 (37.50%)
Oligomenorrhoea	1 (5.88%)	1 (12.50%)
Hypomenorrhoea	1 (5.88%)	2 (25%)
Amenorrhoea	1 (5.88%)	0
Menorrhagia	6 (35.29%)	2 (25%)
Polymenorrhoea	4 (23.52%)	1 (12.50%)

In hypothyroid group, pallor was present in 52.90%, myxoedema, bradycardia and HTN in 23.52% each. Goitre and DTR in 17.64% each. Tachycardia and Dermopathy in 11.76% each, galactorrhoea and eye signs in 5.88% each. In hyperthyroid group 62.50% showed tachycardia, 37.50% had goiter, 25% each had pallor and eye signs, 12.50% each had myxoedema, DTR, Dermapathy and hypertension.

Table 9: Subjective response to treatment.

Thyroid disorders	Menorrhagia	Oligomenorrhoea hypomenorrhoea amenorrhoea
Hypothyroid	58.31%	57.14%
Hyperthyroid	75%	66%

DISCUSSION

In present study, most of the patients with DUB presented in the age group of 35-45 years (53.33%), followed by 25-34 years (28%) and 18.66% were in 15-24 years age group. Pilli et al also reported most of DUB patients (58%) in 21-40 years age group.[7] As far as parity in DUB (Group A) patients was concerned, 73.33% were multiparous, 6.66% were para 1, and 6.66% were nulliparous. Pilli et al also reported 87% multipara, 7% para 1, and 6% nulliparious patients in DUB study.[7]

In present study of 75 patients of DUB (Group A), menorrhagia was chief complaint in 72% patients, with 56% also complaining of polymenorrhoea, while 1.33% patients complained of amenorrhoea.[7] Pilli et al also reported menorrhagia as the commonest type of bleeding (34%), profuse bleeding following amenorrhoea in 14% and polymenorrhoea in 11% as least common.[7] Mehrota et al found an incidence of 54.2% menorrhagia in their series.[8]

In present study most of the patients had easy fatigability (48%) which can be compared with that of Doifode and Fernandes as 43%, followed by hypertension (20%), weight gain (16%), cold intolerance (16%), heat intolerance (12%), paliptations (16%), tachycardia (16%), weight loss (5.33%), goiter (6.66%), edema (8%), delayed tendon reflexes (5.33%), dry skin and hair loss (12%) and eye signs (4%).[9] In present study 9.3% patients with menstrual irregularities had subclinical thyroid dysfunction which was similar to study by Muzaaferi who found it in 10% of cases.[10] Prevalence of hypothyroidism in present study (Group A) was 22.66%, with 24.13% in menorrhagia group and 11.76% in oligomenorrhoea/hypotmenorrhoea/amenorrhoea group. Mukherjee and Ghosh showed 44% incidence of hypothyroidism in their study.[11]

Doifode and Fernandes showed 28.17% incidence of hypothyroidism in DUB patients.[9] Wilansky and Greisman based on evalulation of clinically euthyroid menorrhagic women by a thyrotropin releasing hormone test (TRH test) quoted a prevalence of some 22.38% of early hypothyroidism.[12] In present study of group B, most of the hypothyroid patients with menstrual complaints were in 35-45 years (64.70%) followed by 25-34 years (23.52%) and in 15-24 years (11.76%). This goes in accordance with study by Doifode and Fernandes who had 48.33% patients of DUB with hypothyroidism in 31-40 years, 23.3% above 40 years, 16.67% in 21-30 years and 11.67% below 20 years.[9] In hyperthyroid group with menstrual disturbances, 62.5% were in 35-45 years, 25% in 25-34 years and 12.5% in 15-24 years age group. In present study of group B, 25 already diagnosed cases of thyroid disorders, which included 17 hypothyroid and 8 hyperthyroid cases, gave us an incidence of 47% normal menstrual cycles in hypothyroid group, which goes hand in hand with 46.87% normalcy observed by Lahiri et al.[13]

35.29% hypothyroid women had menorrhagia/ polymenorrhoea and 17.64% had oliogomenorrhoea/ hypomenorrhoea/ amenorrhoea. Menon and Bharucha gave incidence of 46.15% menorrhagia/ polymenorrhoea and 23.07% oligomenorrhoea in the hypothyroid patients that nearly matches our results.[14] Though Singh et al have reported a high incidence of oligomenorrhoea in the hypothyroid patients having infertility yet menorrhagia incidence is same as in present study.[15]

56% of the patients of myxedema studied by Scott and Mussey presented with abnormal menstruation and most of them with menorrhagia and metrorrhagia.[16] Means observed menorrhagia in 32% of premenopausal women with myxedema.[17] In present study, primary infertility and galactorrhoea was found in 5.8% patients from group B apart from menstrual complaints. Kleinberg et al had noted 1-3% incidence of galactorrhoea in hypothyroidism.[18]

In group B, among the 8 hyperthyroid patients, 37.5% had normal menstrual pattern, 25% had menorrhagia/polymenorrhoea, 37.5% had oligomenorrhoea/hypomenorrhoea/amenorrhoea. Menon and Bharucha found 17% menorrhagia, 50% hypomenorrhoea and 33% regular cylces in the hyperthyroid patients.[14] Benson and Dailey found 17% menorrhagia, 50% hypomenorrhoea and 33% regular cycles in the hyperthyroid patients.[19]

Benson and Dailey found 58% oligomenorrhoea/amenorrhoea and only 5% menorrhagia in hyperthyroid patients.[19] Singh et al reported oligomenorrhoea as the commonest anomaly in 63.6% while menorrhagia only in 9% cases of hyperthyroidism with infertility.[15] Most of the infertility patients present in younger age groups while menorrhagia is common in parous perimenopausal women. This could be the reason of our finding of greater number of cases with menorrhagia than in Singh's study which included infertile hyperthyroid women.

Hyperthyroidism, in contrast to the hypothyroid state is associated with increased production of sex hormone binding globulin. Although the plasma concentration of total testosterone is increased, the free or active fraction of testosterone is reduced. There is also an increased rate of conversation of androgens to estrogens in hyperthyroidism, this reduction in circulating androgen and increased estrogen may explain, in part, the soft skin and fine downy hair growth observed in hyperthyroidism. Estrogen metabolism is altered, with preferential

metabolism of estradiol and estrone by 2-hydroxylation rather than 16 alpha hydroxylation. Their exact effect on hypothalamic pituitary function is unknown. Both the nutitional disturbances and the emotional upheavals associated with hyperthyroidism may also influence menstrual function. Baseline gonadotropin concentrations are frequently elevated in hyperthyroidism, and the absence of an adequate LH surge in the face of tonically elevated gonadotrophins may be one of the causes of anovulation and the menstrual dysfunction seen in this disorder.

Hyperthyroxinemia may have augmented gonadotrophin response to gonadotrophin releasing harmone. The precise neuroendocrine relationship in this disorder require further clarification to account for the variable patterns of ovulatory function that may exist. In present study of group B, out of 17 hypothyroid patients with menorrhagia/oligomenorrhoea, 53% responded to Eltroxin treatment which is little lower than 78% response obtained by Doifode and Fernandes but more than Lahiri et al though he obtained very good response to thyroxine in infertility and abortion cases.[9] We observed 58.31% and 57.14% response in menorrhagia and oligomenorrhoea respectively.

Menon and Bharucha obtained 66% response in menorrhagic patients.[14] Lower response in present study may be due to short period of medical treatment because of perimenopausal patients visiting gynae OPD with intent of surgery. 75% hyperthyroid patients with menorrhagia as against 66% with oligomenorrhoea/hypomenorrhoea responded to treatment with antithyoid drungs (neomercazole/propylthiouracil) with return to normal menstrual pattern. Menon and Bharucha report an improvement of 75% in hypomenorrhoea. Interestingly, one of our patients had fibroids detected on hysterectomy.

CONCLUSION

Thyroid function tests, many of which are sensitive radioimmunoassay, radiometric assays and even new chemiluminescence method, which can detect minute changes in hormone levels must be done in women presenting with menstrual disorders, and also in those presenting with fatigue, obesity, lethargy in addition to infertility, luteal phase defects, delayed puberty and recurrent abortions. "Occult menorrhagia" has also been found to be an early manifestation of subclinical hypothyroidism with disease becoming symptomatic later.

The subclinical cases may be benefited from medical management before resorting to surgery, especially the younger patients. The detection of 'subclinical hypothyroidism in periminopausal women with DUB and its treatment with small doses of Eltroxin will also alleviate chronic fatigue, which may of our menopausal women keep suffering from and remain undiagnosed.

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