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Original Research Article

Assessment of thyroid dysfunction in women with menstrual disorders in reproductive age group

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ABSTRACT

Background: Thyroid disorders are among the most common endocrine disorders in the world. Thyroid dysfunction can disrupt a variety of metabolic and physiological processes, including the menstrual cycle. The purpose of this study was to discover a pattern of thyroid dysfunction in women with menstrual disorders.

Methods: It is a cross-sectional study that includes 116 women with reproductive age menstrual disorder. Thyroid dysfunction was tested in women who had menstrual problems. Serum free triiodothyronine (T3), free thyroxine (T4), and thyroid stimulating hormone (TSH) levels were used to assess thyroid function.

Results: The mean age of study patients was 25.7±6.8 years. The most common menstrual disorder was irregular cycle 72.5%, amenorrhea 21.9%, and menorrhagia 5.6%. The majority of the patients were between the ages of 15 and 24 (51.1%), followed by 25-34 (36.1%) and 35-45 (12.9%). The mean free T3 and T4 levels were 2.911.05 pg/ml and 1.420.57 ng/dl, respectively. TSH was 2.0 mIU/L on average (IQR, 1.0-4.0). Thyroid dysfunction was observed in 25.8% of the women (n=60). Subclinical hypothyroidism (14.2%, n=33) was the most common thyroid dysfunction, followed by subclinical hyperthyroidism (6.9%, n=16), overt hyperthyroidism (3%, n=7), and overt hypothyroidism (1.7%, n=4).

Conclusions: The study reveals that women with menstrual disorders frequently have thyroid dysfunction, particularly subclinical hypothyroidism. In order to rule out thyroid disorders as potential etiological agents for menstrual disturbances, it may therefore be advantageous to screen patients with menstrual disorders for thyroid function.

Keywords: Menstrual disorder, Reproductive age, Thyroid dysfunction

INTRODUCTION

Menstrual disorders are a common issue for women of reproductive age and are responsible for 20% of visits to gynaecology OPD, which is a significant burden. These lead to significant social embarrassment, reduced productivity and quality of life, financial burden, and surgical procedures like hysterectomy.¹ Both directly affecting the ovaries and indirectly interacting with sex hormone-binding globulin, thyroid hormones play a significant role in normal reproductive physiology.² Thyroid conditions are more prevalent in women than in men and are associated with abnormal sexual maturation,

menstrual irregularities, infertility, and early menopause. Thyroid issues are among the most prevalent endocrine illnesses in India.³ Thyroid disorders are more common as people age, and about 26% of premenopausal and menopausal women have some form of thyroid disease.⁴ The onset of clinically obvious hypothyroidism or hyperthyroidism is preceded by menstrual abnormality.⁵ A number of reproductive disorders, including abnormal sexual development, irregular menstruation, and infertility, are linked to hypothyroidism.⁶ Before becoming symptomatic, occult menorrhagia (modest disturbances in menstrual amount blood and duration) is linked to subclinical hypothyroidism.⁷ For women, the prevalence

of subclinical hypothyroidism can reach 9.5%.⁸ When hyperthyroidism develops before puberty, menstruation is delayed. The most frequent abnormalities linked to hyperthyroidism in females of reproductive age are oligomenorrhea and amenorrhea.⁹ Additionally, various forms of thyroid dysfunction are linked to thyroid autoimmunity.¹⁰ Prompt identification and treatment of thyroid disorders in patients who present with menstrual disorders can avoid surgical procedures like curettage, hysteroscopy, hysterectomy, etc.⁹ In order to assess the prevalence of thyroid disorders and their relationship to menstrual disorders in women of reproductive age, this study was carried out.

METHODS

This present cross-sectional study was conducted at obstetrics and gynecology department at Sri Aurobindo Medical College and Post Graduate Institute, Indore and who satisfy the inclusion criteria was be studied from 1st April 2021 to 30th September 2022 (18 months). After approval from Institutional ethical committee. Each patient fulfilling the inclusion criteria was be included in the study. Informed written consent was taken. A pre-structured proforma was be used to collect the baseline data. Detailed clinical examination and biochemical tests was be done on all patients as per the protocol.

Inclusion criteria

It is a cross sectional study which involves the women with menstrual disorder of reproductive age.

Exclusion criteria

Woman with abnormal uterine bleeding undergoing thyroid profile test. Patients using contraceptives: IUCD

users, OC pills, inj. DMPA, or with Bleeding disorders were excluded.

Detailed history, clinical examination and lab investigations of the patient was be done. All the patient fulfilling the inclusion criteria was be thoroughly investigated. All the relevant menstrual, obstetric, medical, personal and surgical history along with thorough clinical examination was be done. Predesigned pre-structured proforma was be used for collecting the data. The data was also be obtained from history and biochemical blood investigations which shall be directly transcribed from the reports to the proforma by the investigator.

Statistical analysis

Descriptive statistic was be used to show features and characteristics of the data. Chi square test was used to show association. P value less than 0.05 will be considered as statistically significant.

RESULTS

Patients in the study had an average age of 25.7±6.8 years. The most prevalent menstrual disorder among the study participants was an irregular cycle (72.5%, n=84), which was followed by amenorrhea (21.9%, n=25), and menorrhagia (5.6%, n=6). 15–24 years old made up the majority of the patient population (51.1%, n=59), followed by 25–34 years (36.1%, n=42), and 35–45 years (12.9%, n=15). The average levels of free T3 and T4 were respectively 2.911.05 pg/ml and 1.420.57 ng/dl. TSH was 2.0 mIU/L on average (1.0- 4.0). Table 1 displays thyroid hormone levels by type of menstrual disorder. Different menstrual disorders showed a significant difference in free T3 (p=0.026) and TSH level (p=0.012).

Table 1: Thyroid hormones level according to menstrual disorders.

Hormones	Total, n=116	Irregular cycle, n=84	Amenorrhea, n=25	Menorrhagia, n=6	P value
Free T3 (pg/ml)	2.91±1.05	2.88±0.89	3.16±1.45	2.31±0.86	0.026
Free T4 (ng/dl)	1.42±0.57	1.41±0.54	1.55±0.67	1.15±0.38	0.062
TSH (mIU/L)	2.0 (1.0-4.0)	2.0 (1.0-3.0)	2.0 (1.0-4.0)	5.0 (2.5-6.0)	0.012

Thyroid hormone levels are expressed as mean±SD except for TSH which is expressed as median (IQR). P value was calculated using one way ANOVA and Kruskal wallis test at 95% confidence interval.

Table 2: Thyroid function status according to menstrual disorders and age range.

Thyroid status	Total, n=116	Irregular cycle, n=84	Amenorrhea, n=25	Menorrhagia, n=6	P value	15-24 years, n=59	25-34 years, n=42	35-45 years, n=15	P value
Euthyroid	86 (74.2%)	63 (54.5%)	19 (16.3%)	4 (3.2%)	0.557	46 (39.5%)	30 (26%)	10 (8.6%)	0.449
Subclinical hypothyroidism	16 (14.2%)	10 (8.6%)	4 (3.9%)	1 (1.4%)	0.122	5 (4.2%)	8 (6.6%)	3 (2.6%)	0.088

Continued.

Thyroid status	Total, n=116	Irregular cycle, n=84	Amenorrhoea, n=25	Menorrhagia, n=6	P value	15-24 years, n=59	25-34 years, n=42	35-45 years, n=15	P value
Overt hypothyroidism	2 (1.7%)	2 (1.3%)	-	1 (0.48%)	0.162	1 (0.48%)	1 (0.48%)	1 (0.86%)	0.08
Subclinical hyperthyroidism	8 (6.9%)	7 (6.4%)	1 (0.46%)	-	0.139	5 (4.3%)	2 (1.7%)	1 (0.86%)	0.6
Overt hyperthyroidism	3 (3%)	2 (1.7%)	1 (1%)	-	0.352	2 (2.1%)	1 (0.86%)	-	0.44

The data is expressed as number (percentage). P value was calculated using chi-square test at 95% confidence interval.

A total 25.8% (n=30) of the study participants had some form of thyroid dysfunction, compared to 74.2% (n=86) of the euthyroid patients. Subclinical hypothyroidism (14.2%, n=16), subclinical hyperthyroidism (6.9%, n=8), overt hyperthyroidism (3%, n=3), and overt hypothyroidism (1.7%, n=4) were the most prevalent thyroid disorders. Table 2 displays thyroid dysfunction by menstrual disorder type and age range. There was no discernible difference in thyroid dysfunction between the various menstrual disorders and age subgroups.

DISCUSSION

In the current study, we found that women visiting the thyroid laboratory most frequently had irregular cycles, and a large portion of the patients were in the 15-24 age range. The majority of patients in a different study of people with abnormal uterine bleeding were, however, in the 35-45 age group (54%), followed by the 25-34 age group (28%).¹¹ Menorrhagia made up 50% of the most common menstrual complaint among 100 patients with abnormal uterine bleeding, followed by polymenorrhoea (19%), menometrorrhagia (18%), metropathia haemorrhagica (7%), and irregular bleeding with an unknown pattern (6%), according to a study by Pahwa et al.¹² Menstrual disorders were discovered to be the second most common gynaecological issue (23.80%) in a study of adolescent girls.¹³ Women with menstrual disorders made up 25.8% of the study's participants, and those with menorrhagia had higher TSH levels and lower free T3 levels than those with other menstrual disorders. There were fewer menorrhagic women in the current study, which may have contributed to the higher level of TSH and lower free T3 found in this condition compared to other menstrual disorders. Subclinical hypothyroidism was the most common type of thyroid dysfunction, and it was followed by subclinical hyperthyroidism, overt hyperthyroidism, and overt hypothyroidism. Thyroid dysfunction has been documented in various populations in previous studies of women with menstrual disorders.^{11,12} Sharma et al. reported hypothyroidism and hyperthyroidism in 22% and 14% of patients, respectively, in a study of people with abnormal uterine bleeding.¹¹ In a study by Pahwa et al, among 100 patients with abnormal uterine bleeding, 22 were found to have hypothyroidism, 2 to have hyperthyroidism, and the remaining patients had euthyroidism.¹² Thyroid dysfunction has also been discovered in a significant portion of the study population

in earlier studies among people.^{14,15} Menstrual irregularities and thyroid dysfunction have been linked, but research has shown that menstrual irregularities can occur more frequently or less frequently in thyroid dysfunction.¹⁶ Menstrual irregularities can result from either hyperthyroidism or hypothyroidism because thyroid hormones have an impact on the menstrual cycle.¹⁷ The ovaries are directly affected by thyroid hormones, and these hormones also indirectly affect sex hormone binding proteins, which in turn affects the ovaries, to a significant extent, in normal reproductive function. Menstrual irregularities and infertility are both (reversible) effects of thyroid dysfunction. Menstrual irregularities can be reversed and fertility improved by treating thyroid dysfunction.¹⁸

Limitations

The study has several drawbacks. First, the sample size was small, so a larger population may be needed to confirm results. The cross-sectional study found no causal link between menstrual disorders and thyroid dysfunction. Since these elements were not studied, thyroid autoimmunity and iodine excess or deficiency in the study population may also cause thyroid disorders in study patients.

CONCLUSION

Thyroid dysfunction, particularly subclinical hypothyroidism, is common in women with menstrual irregularities, according to the study. Thyroid dysfunction screening may help rule out thyroid disease as a cause of menstrual disturbance.

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Conflict of interest: None declared

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

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