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ASSOCIATION BETWEEN REPRODUCTIVE DYSFUNCTION WITH SPECIAL REFERENCE TO ABNORMAL UTERINE BLEEDING AND THYROID DYSFUNCTION: A STUDY FROM KOLKATA, INDIA

Obstetrics & Gynaecology

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ABSTRACT

Introduction: Thyroid gland plays important role in growth, development, metabolism and function of every organ in the body. Hypothyroidism and hyperthyroidism leads to menstrual irregularities. Females with thyroid gland abnormality have chances of reproductive abnormalities ranging from abnormal sexual development, menstrual irregularities including abnormal uterine bleeding (AUB), infertility and premature menopause. **Objective:** To determine the association between menstrual disorders and thyroid dysfunction from puberty to menopause. **Methodology:** The present descriptive observational study was carried out in a tertiary care hospital in Kolkata, India, involving 240 patients who attended OPD during the period from 1st March 2021 to 28th February 2022. **Results:** 164 (68.3%) patients had euthyroid, 4 (1.7%) patients had overt hyperthyroidism, 24 (10.0%) patients had overt hypothyroidism; 4 (1.7%) patients had subclinical hyperthyroidism and 44 (18.3%) patients had subclinical hypothyroidism. Association of age in years with type of thyroid dysfunction was statistically significant ($p<0.0001$). Association of both reproductive dysfunction and menstrual abnormality with type of thyroid dysfunction was statistically significant ($p<0.0001$). **Conclusion:** Prevalence of overt hypothyroidism was 10.0%, overt hyperthyroidism was 1.70%, subclinical hypothyroidism was 18.3% and subclinical hyperthyroidism was 1.70%. Thyroid dysfunction was significantly associated with age, menstrual abnormality and reproductive dysfunction.

KEYWORDS

Thyroid Dysfunction, Abnormal Uterine Bleeding, Menstrual Disorders

INTRODUCTION

Thyroid gland plays important role in growth, development, metabolism and function of every organ in the body (Olive et al 2002; Gollakota et al 2017). Hypothyroidism and hyperthyroidism leads to menstrual irregularities. Females with thyroid gland abnormality have chances of reproductive abnormalities ranging from abnormal sexual development, menstrual irregularities, infertility and premature menopause (Thomas and Reid 1987; Yatish et al 2022). Because of autoimmune nature of thyroid disorders, thyroid disorder prevalence is seen more among females (Mazzaferri, 1997). Incidence increases with age and its prevalence is 26% in women (Kochupillai 2000, Hollowell 2002). Hypothyroidism even in subclinical form can cause menorrhagia Gollakota et al 2017).

The menstrual pattern is influenced by thyroid hormones directly through impact on the ovaries and indirectly through impact on SHBG, PRL and GnRH secretion and coagulation factors. Severe hypothyroidism is commonly associated with ovulatory dysfunction due to numerous interactions of thyroid hormones with the female reproductive system. Secondary hyperprolactinaemia, due to increased TRH production, and altered GnRH pulsatile secretion, leading to a delay in LH response and inadequate corpus luteum, in hypothyroid have been reported (Scanlon et al, 1981; Thomas and Reid 1987; Longcope et al, 1990). Thyroid responsivity by the ovaries could be explained by the presence of thyroid hormone receptors in human oocytes (Thomas and Reid 1987). The objective of our study is to determine the association between reproductive dysfunction mainly menstrual disorders and thyroid dysfunction from puberty to menopause.

MATERIALS AND METHODS

A descriptive observational study was carried out in a tertiary care hospital in Kolkata, India, involving 240 patients who attended OPD during the period from 1st March 2021 to 28th February 2022.

Table 1: Inclusion and Exclusion criteria for patient involved in this study

S.No.	Inclusion criteria	Exclusion criteria
1.	All women with abnormal uterine bleeding	Patients with previous known thyroid disorder
2.	No obvious cervical and genital lesions	Abortion history within 3 months
3.	Not on hormonal therapy	History of childbirth within 1 year
4.	No evidence of any haematological disorder	IUCD /OC pill users
5.	No contraindications for dilatation and curettage study	Patients with known liver disorders or coagulopathy
6.	Patients willing to give consent	Known cases of cancer of genital organs
7.		Known cases of autoimmune disorders
8.		Patients not willing to give consent

Method of Data Collection: The data was collected using a prepared Performa meeting the objectives of the study after taking verbal consent.

Procedure Of Study: The study protocol included a thorough history taking regarding age, bleeding pattern (onset, duration, quantity of bleeding) and complaints related to thyroid dysfunction was noted in detail. A thorough clinical examination including general physical examination, neck examination, systemic and gynaecologic examinations was carried out. All the recruited patients was subjected to routine investigations like CBC, LFT, RBS, complete urine examination, bleeding time, clotting time, chest x-ray, ultrasound abdomen and pelvis, PAP smear, endometrial biopsy. All patients were subjected to T3, T4 and TSH. T3 and T4 were assayed by competitive chemiluminescent immunoassay. TSH was estimated by ultra-sensitive fully automated ADV1A centaur, using two sites, chemiluminescent immunoassay and analyzed.

RESULTS

In our study, 4 (1.7%) patients were <20 years of age, 72 (30.0%) patients were 21-30 years of age, 136 (56.7%) patients were 31-40 years of age and 28 (11.7%) patients were ≥41years of age. In our study, 44 (18.3%) patients had multipara, 49 (20.4%) patients had parity one (P1) and 147 (61.3%) patients had two (P2). In our study, 12 (5.0%) patients had amenorrhea, 27 (11.3%) patients had frequent menses, 135 (56.3%) patients had heavy menstrual bleeding, 55 (22.9%) patients had infrequent menses, 4 (1.6%) patients had intermenstrual bleeding and 7 (2.9%) patients had scanty menses.

Table 2: Demographic profile of study population

Age in years	Frequency	Percent
<20	4	1.70%
21-30	72	30.00%
31-40	136	56.70%

≥41	28	11.70%
Total	240	100.00%
Parity		
Multipara	44	18.30%
P1	49	20.40%
P2	147	61.30%
Total	240	100.00%
Menstrual Abnormality		
Amenorrhea	12	5.00%
Frequent menses	27	11.30%
Heavy menstrual bleeding	135	56.30%
Infrequent menses	55	22.90%
Intermenstrual bleeding	4	1.70%
Scanty menses	7	2.90%
Total	240	100.00%

In our study, 164 (68.3%) patients had euthyroid, 4 (1.7%) patients had overt hyperthyroidism, 24 (10.0%) patients had overt hypothyroidism; 4 (1.7%) patients had subclinical hyperthyroidism and 44 (18.3%) patients had subclinical hypothyroidism.

Table 3: Type of thyroid disorder

Type of thyroid dysfunction	Frequency	Percent
Euthyroid	164	68.30%
Overt hyperthyroidism	4	1.70%
Overt hypothyroidism	24	10.00%
Subclinical hyperthyroidism	4	1.70%
Subclinical hypothyroidism	44	18.30%
Total	240	100.00%

In euthyroid, 44 (26.8%) patients were 21-30 years of age, 108 (65.9%) patients were 31-40 years of age and 12 (42.9%) patients were ≥41years of age. In overt hyperthyroidism, 4 (100.0%) patients were 21-30 years of age. In overt hypothyroidism, 4 (16.7%) patients were <20 years of age, 4 (16.7%) patients were 21- 30 years of age, 8 (33.3%) patients were 31-40 years of age and 8 (33.3%) patients were ≥41years of age. In subclinical hyperthyroidism, 4 (100.0%) patients were 31-40 years of age. In subclinical hypothyroidism, 20 (45.5%) patients were 21-30 years of age, 16 (36.4%) patients were 31-40 years of age and 8 (18.2%) patients were ≥41years of age. Association of age in years with type of thyroid dysfunction was statistically significant (p<0.0001).

Table 4: Association between age in years: Type of thyroid dysfunction

Age in years	Euthyroid	Overt hyperthyroi dism	Overt hypothyr oidism	Subclinical hyperthyroidism	Subclinical hypothyroidism	Total
<20	0	0	4	0	0	4
Row %	0	0	100	0	0	100
Col %	0	0	16.7	0	0	1.7
21-30	44	4	4	0	20	72
Row %	61.1	5.6	5.6	0	27.8	100
Col %	26.8	100	16.7	0	45.5	30
31-40	108	0	8	4	16	136
Row %	79.4	0	5.9	2.9	11.8	100
Col %	65.9	0	33.3	100	36.4	56.7
≥41	12	0	8	0	8	28
Row %	42.9	0	28.6	0	28.6	100
Col %	7.3	0	33.3	0	18.2	11.7
Total	164	4	24	4	44	240
Row %	68.3	1.7	10	1.7	18.3	100
Col %	100	100	100	100	100	100

Chi-square value: 75.6004; **p-value:** <0.0001

In euthyroid, 16 (9.8%) patients had miscarriage and 4 (2.4%) patients had subfertility. In overt hyperthyroidism, 4 (100.0%) patients had miscarriage. In overt hypothyroidism, 4 (16.7%) patients had miscarriage and 4 (16.7%) patients had secondary subfertility.

In subclinical hyperthyroidism, 4 (100.0%) patients had secondary subfertility. In subclinical hypothyroidism, 8 (18.2%) patients had miscarriage, 36 (81.8%) patients had secondary subfertility. Association of reproductive dysfunction with type of thyroid dysfunction was statistically significant (p<0.0001)

Table 5: Association between reproductive dysfunction: Type of thyroid dysfunction

Type of thyroid dysfunction						
Reproductive dysfunction	Euthyroid	Overt hyperthyroidism	Overt hypothyroidism	Subclinical hyperthyroi dism	Subclinical hypothyroidism	Total
Miscarriage	16	4	4	0	8	32
Row %	50.0	12.5	12.5	0.0	25.0	100.0
Col %	9.8	100.0	16.7	0.0	18.2	13.3
Nil	144	0	16	4	36	200
Row %	72.0	0.0	8.0	2.0	18.0	100.0
Col %	87.8	0.0	66.7	100.0	81.8	83.3
Secondary subfertility	0	0	4	0	0	4
Row %	0.0	0.0	100.0	0.0	0.0	100.0
Col %	0.0	0.0	16.7	0.0	0.0	1.7
Subfertility	4	0	0	0	0	4
Row %	100.0	0.0	0.0	0.0	0.0	100.0
Col %	2.4	0.0	0.0	0.0	0.0	1.7
Total	164	4	24	4	44	240
Row %	68.3	1.7	10.0	1.7	18.3	100.0
Col %	100.0	100.0	100.0	100.0	100.0	100.0

Chi-square value: 68.1424; p-value: <0.0001

In euthyroid, 4 (2.4%) patients had amenorrhea, 19 (11.6%) patients had frequent menses, 95 (57.9%) patients had heavy menstrual bleeding, 35 (21.3%) patients had infrequent menses, 4 (2.4%) patients had intermenstrual bleeding and 7 (4.3%) patients had scanty menses. In overt hyperthyroidism, 2 (25.0%) patients had amenorrhea and 2 (50.0%) patients had heavy menstrual bleeding. In overt hypothyroidism, 6 (2.4%) patients had amenorrhea, 14 (58.3%) patients had heavy menstrual bleeding and 4 (16.7%) patients had infrequent menses. In subclinical hyperthyroidism, 4 (100.0%) patients had infrequent menses. in subclinical hypothyroidism, 8 (18.2%) patients had frequent menses, 24 (54.5%) patients had heavy menstrual bleeding and 12 (27.3%) patients had infrequent menses. Association of menstrual abnormality with type of thyroid dysfunction was statistically significant (p<0.0001).

Table 6: Association between menstrual abnormality: Type of thyroid dysfunction

Menstrual Abnormality	Euthyroid	Overt Hyperthyroidism	Overt Hypothyroidism	Subclinical Hyperthyroidism	Subclinical Hypothyroidism
Amenorrhea	4	2	6	0	0
Row %	33.3	16.7	50.0	0	0.0
Col %	2.4	50.0	25.0	0	0.0
Frequent menses	19	0	0	0	8
Row %	70.4	0.0	0.0	0	29.6
Col %	11.6	0.0	0.0	0	18.2
Heavy menstrual bleeding	95	2	14	0	24
Row %	70.4	1.5	10.4	0	17.8
Col %	57.9	50.0	58.3	0	54.5
Infrequent menses	35	0	4	4	12
Row %	63.6	0.0	7.3	7.3	21.8
Col %	21.3	0.0	16.7	100.0	27.3
Intermenstrual bleeding	4	0	0	0	0
Row %	100.0	0.0	0.0	0.0	0.0
Col %	2.4	0.0	0.0	0.0	0.0
Scanty Menses	7	0	0	0	0
Row %	100.0	0.0	0.0	0.0	0.0
Col %	4.3	0.0	0.0	0.0	0.0
Total	164	4	24	4	44
Row %	68.3	1.7	10.0	1.7	18.3
Col %	100.0	100.0	100.0	100.0	100.0

Chi-square value: 65.1843; p-value: <0.0001

DISCUSSION

During this study, women with abnormal uterine bleeding, no obvious cervical and genital lesions, not on hormonal therapy, no evidence of any haematological disorder and no contraindications for dilatation

and curettage procedure were included. Ashok et al (2017) showed that thyroid gland is the most vital endocrine organ which plays a major role in growth, development, metabolism and function of almost every organ of their body. Both hypothyroidism and hyperthyroidism can result in menstrual irregularities. As per present study, majority of the patients with abnormal uterine bleeding (AUB) were from the age group of 35-49 years (43%). According to their study thyroid dysfunction was most commonly seen in the age group of 35-49 years. Hema et al (2020) observed that AUB is one of the commonest presentations encountered in gynecological outpatient department. Menstruation is also regulated by many mechanisms, including thyroid hormone. AUB was most common among woman age 40 years at 49.23% (257 of total 522 cases). Thakur et al (2020) examined that AUB is a common gynecological presentation, accounting for at least 20% of all new outpatient visits. It has been recognized that thyroid dysfunction may have profound effects on the female reproductive system (Yatish et al 2022). The maximum number of patients was between 20-25 years with the mean age of 31 years.

In our study, out of 240 patients most of the patients were 31-40 years old [136 (56.7%)]. 108 (65.9%) patients were 31-40 years of age in Euthyroid, 4 (100.0%) patients were 21-30 years of age in overt hyperthyroidism, 8 (33.3%) patients were 31-40 years of age in overt hypothyroidism, 4 (100.0%) patients were 31-40 years of age in subclinical hyperthyroidism and 20 (45.5%) patients were 21-30 years of age in subclinical hypothyroidism, which was statistically significant ($p<0.0001$).

Tamilarasi et al (2020) observed that a relationship between the thyroid gland and the gonads is suggested by far more frequent occurrence of thyroid disorders in women than in men by clinical appearance of goiter during pregnancy, puberty, and menopause after detailed history taking with an emphasis on age, parity, infertility, and menstrual disorders.

Our study showed that, higher number of patients had Parity2l2 in overt hyperthyroidism and subclinical hyperthyroidism [4 (100.0%)] compared to subclinical hypothyroidism [28 (63.6%)], euthyroid [107 (65.2%)] and parity 1l1 in overt hypothyroidism [12 (50.0%)] but this was statistically significant ($p=0.0006$).

We found that, lower number of patients had sub fertility in euthyroid [4 (2.4%)] compared to miscarriage and secondary subfertility in overt hypothyroidism [4 (16.7%)], subclinical hypothyroidism [8 (18.2%)], overt hyperthyroidism and subclinical hyperthyroidism [4 (100.0%)], which was statistically significant ($p<0.0001$).

CONCLUSION

In our study, out of 240 patients most were 31-40 years old and age was significantly associated with type of thyroid dysfunction. Our study showed that, higher number of patients had parity P2 in overt hyperthyroidism and subclinical hyperthyroidism compared to subclinical hypothyroidism, euthyroid and parity P1 in overt hypothyroidism but this was statistically significant. We found that, lower number of patients had sub fertility in euthyroid compared to miscarriage and secondary sub fertility in overt hypothyroidism, subclinical hypothyroidism, overt hyperthyroidism and subclinical hyperthyroidism which was statistically significant. We observed that, majority number of patients had infrequent menses in subclinical hyperthyroidism compared to heavy menstrual bleeding in overt hypothyroidism, euthyroid, subclinical hypothyroidism and overt hyperthyroidism though it was statistically significant. In recent times, the incidence of thyroid diseases has increased significantly thus seriously affecting human life (Fang et al, 2022). As per our present study, thyroid diseases are being positively associated with women with AUB, hence more and more improvement in screening and treatment technologies are warranted. This would also avoid unnecessary hormonal treatment and surgery in these patients.

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