Section: General Medicine

Original Research Article

EVALUATION OF THYROID DYSFUNCTIONS IN PERIMENOPAUSAL WOMEN: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: One of the prevalent conditions affecting perimenopausal women is thyroid dysfunction. Thyroid dysfunction symptoms are frequently mistaken for perimenopausal hormonal changes. This results in the use of needless drugs and the neglect of vital medical care. The aim and objective is to study the incidence of thyroid dysfunction in perimenopausal women and to study the clinical profile of thyroid dysfunction in perimenopausal women.

Materials and Methods: This is a cross-sectional descriptive study, which was conducted in the department of medicine, Bapuji Hospital, and Chigateri General Hospital, Davangere. The study comprised 100 women between the ages of 40 and 55, and a thorough history, clinical examination, and laboratory testing were used to evaluate the patients.

Results: The Highest incidence (45%) of thyroid dysfunction was seen in the age group 40-45 years. Hypothyroidism was the most common thyroid disorder observed in the perimenopausal women, followed by subclinical hypothyroidism, hyperthyroidism. The most common menstrual disorder observed in the study group was menorrhagia (56%) of patients, followed by oligomenorrhea (32%). Common perimenopausal symptoms observed in patients of thyroid dysfunction were menstrual disturbances (88%), weight gain (65%), mood swings and irritability (74%), anxiety, depression (61%), and loss of libido (5%).

Conclusion: Thyroid dysfunction is common in perimenopausal women & the symptoms of thyroid dysfunction mimic the symptoms of perimenopausal hormonal fluctuations.

Keywords: Perimenopause, Thyroid dysfunction, Hypothyroidism, Hyperthyroidism, Subclinical hypothyroidism.

INTRODUCTION

According to the American Association of Clinical Endocrinologists (AACE), thyroid dysfunction may be the cause of untreated menopausal-like symptoms in millions of women, including those on estrogen.[1] Though they are often linked to menopause, symptoms including melancholy, mood swings, sleep difficulties, and exhaustion can also indicate hypothyroidism.[2] Just one in four women who have talked to a doctor about menopause and related symptoms were also tested for thyroid problems, according to an AACE survey.[3] The thyroid affects muscle strength, appetite, the heart, brain, kidney, and reproductive system in addition to controlling the body's overall metabolism.[4]

The relationship between thyroid and menopause is intricate. In actuality, it results from close relationships between the reproductive organs and thyroid hormones.[5] The thyroid produces hormones that directly affect the action of the reproductive glands because they control metabolism.[6] Furthermore, thyroid uptake receptor sites are directly impacted by estrogen and progesterone, which either inhibit or permit their action. The thyroid is also impacted by and interacts with the synthetic hormones used in hormone replacement therapy.[7] To save money and provide effective care,

the American Thyroid Association established minimal standard recommendations for primary care physicians to follow when evaluating patients who exhibit symptoms of or have known thyroid diseases. Screening is suggested for women beginning at age 35 and at subsequent 5-year intervals, for individuals with a strong family history of thyroid disease, the elderly, women at 4-8 weeks postpartum, and patients with autoimmune illnesses.[8,9] Clinicians are encouraged to evaluate patients with subtle signs and symptoms of thyroid disease.[10] Hence, the present study was conducted to evaluate the incidence of thyroid dysfunctions in perimenopausal women and their association with their symptoms.

Objectives: To study the incidence of thyroid dysfunction in perimenopausal women and to study the clinical profile of thyroid dysfunction in perimenopausal women.

MATERIALS AND METHODS

This is a descriptive cross-sectional study conducted at Dept. of Medicine, Bapuji Hospital, and Chigateri General Hospital, Davangere. The study included patients of the perimenopausal age group(40 years to 55 years) attending the OPD and admitted to the department of medicine. After getting approval from the institutional ethical committee, this study was carried out.

A total of 100 perimenopausal women in the age group between 40-55 years were included and recruited using a simple, convenient sampling method.

The study procedure was explained to all the included patients in their local languages, and informed consent was taken. Those patients already detected to have thyroid disorder and who are already on treatment, and those patients who have undergone bilateral oophorectomy, were excluded from the study.

Five milliliters of venous blood are drawn from the median cubital vein in a plain, sterile test tube once the patient has been kept comfortable and fasting. It has no chemicals or anticoagulants added. The sample is allowed to coagulate without being disturbed. Centrifugation is then used to separate the serum. The ELISA method was used to estimate T3, T4, and TSH, haemoglobin, and the cholesterol oxidase-peroxidase method was used to estimate cholesterol. Body mass index (BMI) was checked during physical examination. Other investigations like USG and FNAC were also done. The proper history was taken to rule out symptoms of thyroid disorders and perimenopausal symptoms.

Statistical analysis: Categorical variables were presented as frequencies and percentages. To study the association between categorical variables, Chi chi-square test was used. Quantitative data represented using mean & SD. ANOVA was used to compare the mean differences between three groups. Tukey's Post Hoc multiple comparison was done to know inter intergroup comparison. A P value of <0.05 was considered statistically significant. IBM SPSS Version 22 for Windows was used to do statistical analysis.

RESULTS

In this study, 100 women of the perimenopausal age group (40 to 55 years) with newly detected thyroid dysfunction were included. Out of 100 patients, 66 had hypothyroidism, 25 had sub-clinical hypothyroidism, 9 had hyperthyroidism, and none of them had subclinical hyperthyroidism [Figure 1]. The highest incidence (45%) of thyroid dysfunction was seen in the age group 40-45 years compared to 34% in 46-55 years. The occurrence of hypothyroidism was similar in the 40-45 years and 46-50 years age groups.

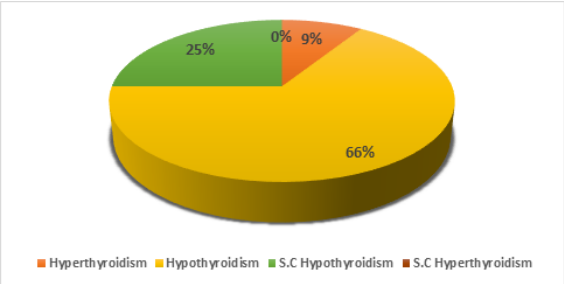

Figure 1: Spectrum of thyroid disorders among patients

Table 1: Clinical profile of patients according to diagnosis

Parameter	Hyperthyroidism(n=9)	Hypothyroidism (n=66)	S.C hypothyroidism (n=25)	P -value
Mean Age	47.89 ± 3.72	45.61 ± 3.96	49.20 ± 4.46	P<0.001**
Thyroid profile				
T3	4.97 ± 1.93	0.57 ± 0.07	1.2 ± 0.40	P<0.000**
T4	17.0 ±1.11	4.02 ±0.46	6.48 ±1.41	P<0.000**
TSH	0.17 ± 0.15	37.22 ±17.88	8.59 ± 0.90	P<0.000**
Hemoglobin	11.82 ± 1.13	11.22 ± 1.35	11.28 ±1.35	P<0.207
Body Mass Index (BMI)	18.06 ±0.378	25.40 ± 2.51	21.92 ± 2.68	P<0.000**
Lipid profile				
TG (mg/dl)	155.89±15.93	212.80±42.39	177.32±35.25	P<0.000**
Total Cholesterol(mg/dl)	157.89±13.49	208.89±31.17	209.76±38.32	P<0.000**
LDL(mg/dl)	157.89±20.73	153.86±19.86	151.00±18.15	P<0.05*

The mean age of patients with hyperthyroidism, hypothyroidism and S.C hypothyroidism was 47.89 ± 3.72, 45.61 ± 3.96 and 49.20 ± 4.46, respectively, which shows a statistically significant association between the perimenopausal age (45-49 years) and thyroid disorders. The mean hemoglobin level in

hyperthyroidism, hypothyroidism and S.C hypothyroidism patients was 11.82 ± 1.13, 11.22 ± 1.35 and 11.28 ±1.35 respectively and statistically not significant (P<0.207). The higher body mass index (25.40 ± 2.51) was seen in patients with hypothyroidism, compared to S.C hypothyroidism (21.92 ± 2.68) and hyperthyroidism (18.06 ±0.378). The association between the BMI and thyroid disorders was statistically significant (P<0.000). Lipid abnormalities are known to be present in patients with thyroid dysfunction. Patients with thyroid dysfunction have higher values of triglycerides (TGs), total cholesterol (T.Chol) and LDL which was found to be statistically significant. (p value <0.000) [Table 1].

Table 2: Lab investigations and clinical features of study subjects

Parameter	Frequency	Number
Goiter		
Yes	10	10
No	90	90
USG		
Thyroiditis	3	3
Colloid goitre	7	7
Normal	90	90
FNAC	3	3
Hashimotos thyroiditis	7	7
Colloid goitre	90	90
Normal		
Menstrual disorders	56	56
Menorrhagia	32	32
Oligomenorrhoea	19	19
Irregular cycle		
Hyperthyroid symptoms		
Irritability / mood	74	74
Swing	7	7
Sweating	2	2
Palpitation	3	3
Weight loss	3	3
Diarrhoea	5	5
Loss of libido	77	77
Hot flushes		
Hypothyroid symptoms	77	77
Tiredness	70	70
Lethargy	48	48
Slowness	18	18
Cold intolerance	38	38
Hair loss	23	23
Poor memory	20	20
Constipation	65	65
Weight gain	18	18
Hoarsness of voice	56	56
Menorrhagia	32	32
Oligomenorrhoea		
Perimenopausal symptoms		
Hot flushes	77	77
Vaginal dryness	42	42
Loss of libido	5	5
Depression	61	61
Menstrual	88	88
Disturbances	74	74
Irritability / mood Swing		

Goitre was seen in 10% of patients. Among which, FNAC showed colloid goiter in 7% and Hashimoto's thyroiditis in 3% of patients. Most common menstrual disorder observed in the study was menorrhagia which was seen in 56% of patients. And, 32% of patients had oligomenorrhea, 19% had irregular cycles and 15% had normal cycles. Among hyperthyroid symptoms most common were oligomenorrhea (32%), fatigue& weakness (8%), hyper-activity and irritability (74%). heat intolerance and sweating (7%) palpitations (2%), diarrhea (3%), Loss of Libido (5%). Common hyperthyroid signs were tachycardia (2%), warm moist skin (7%). Among hypothyroid symptoms most commonly observed symptoms were tiredness and weakness (77%), lethargy (70%), weight gain and poor appetite (65%), slowness (48%), poor memory (23%), menstrual disturbances (88%). Less common symptoms of hypothyroidism were dryness of skin, hoarseness of voice, cold intolerance, and constipation. Common signs found in hypothyroid patients were coarse dry skin (35%), alopecia (38%), and hoarseness of voice (18%). Common perimenopausal symptoms observed in patients of thyroid dysfunction were menstrual disturbances (88%), mood swings& irritability (74%), anxiety and depression (61%), loss of libido(5%) [Table 2].

Table 3: Menstrual disorders according to Diagnosis

Menstrual disorders	Hyperthyroidism (n=9)	Hypothyroidism (n=66)	S.C Hypothyroidism (n=25)	Chi-Square test
Menorrhagia	1	38	17	P<0.01**
Oligomenorrhoea	2	24	6	P<0.05*
Irregular Cycle	5	10	4	P<0.01**

*Statistically significant, ** Statistically Highly significant

Statistically significant association was seen with menstrual disorders and thyroid disorders [Table 3]. Menstrual disorders such as menorrhagia (38), oligomenorrhoea (24) and irregular cycles (10) were more commonly seen in hypothyroidism patients.

Table 4: Perimenopausal symptoms according to diagnosis of thyroid disorders

Perimenopausal symptoms	Hyperthyroidism (n=9)	Hypothyroidism (n=66)	S.C Hypothyroidism (n=25)	Chi Square test
Hot flushes	7	52	18	P<0.78
Vaginal dryness	3	28	11	P<0.85
Loss of libido	5	0	0	P<0.00 **
Depression	6	46	10	P<0.05*
Irritability /mood swing	5	55	14	P<0.05*
Menorrhagia	1	38	17	P<0.01**

*Statistically significant, ** Statistically Highly significant

As shown in [Table 4], all the perimenopausal symptoms such as hot flushes, vaginal dryness, loss of libido, depression, mood swings and menorrhagia were more common in hypothyroidism patients compared to hyperthyroidism and subclinical hypothyroidism.

Loss of libido was observed in 5 out of 9 hyperthyroidism patients, that was statistically highly significant association (P<0.00 **). None of hypothyroidism and S.C hypothyroidism experienced loss of libido. Around 55 hypothyroidism patients out of 66, had mood swings, which shows statistically significant association between hypothyroidism and mood swings (P<0.05*). Similarly, menorrhagia was more common in hypothyroidism patients (P<0.01**).

DISCUSSION

The female reproductive system is significantly impacted by thyroid disorders. The fact that thyroid problems are more common in women than in men suggests a connection between the thyroid gland and the gonads.[11] Although the thyroid's activity and the ovarian maturation process are closely related, the thyroid gland depends on the ovary for both direct and indirect stimulation to perform its own role.[12] Menorrhagia is a common symptom of hypothyroidism, and hypomenorrhea is a common symptom of hyperthyroidism. During the perimenopausal phase, these symptoms are commonly observed.[13]

This study was done in 100 perimenopausal patients with newly detected thyroid dysfunction presenting in the department of Medicine, JJM Medical College, attached to Bapuji Hospital and Chigateri District Hospital. In the present study, the highest incidence (45%) of thyroid dysfunction was seen in the age group 40-45 years compared to 34% in 46-55 years. The occurrence of hypothyroidism was similar in the 40-45 years and 46-50 years age groups.

In the present study, hypothyroidism is the most common thyroid disorder observed in the perimenopausal women, followed by subclinical hypothyroidism, hyperthyroidism. Similarly, Sulabha Avinash Joshi et al, in their study on perimenopausal and postmenopausal women, found that 12.5% of patients had hypothyroidism, 1.5% being overt hypothyroidism, and 11% subclinical hypothyroidism.[14] But, in a study by Mary Fran Sowers et al, Study of Women Across Nations (SWAN), prevalence of hypothyroidism, hyperthyroidism, and sub clinical hypothyroidism was found to be 1.45%, 1.17% and 4.75% respectively.[15] Ayati Sedghesha et al, in their study, found that the prevalence of subclinical hypo and hyperthyroidism was 5% & 1% in peri as well as post-menopausal women.[16] Prevalence of sub clinical hypothyroidism was 6.25% among the patients in the age group of 51-60 years.

Among hypothyroid symptoms most commonly observed symptoms were tiredness and weakness (77%), lethargy (70%), weight gain and poor appetite (65%), slowness (48%), poor memory (23%), menstrual disturbances (88%). Less common symptoms of hypothyroidism were dryness of skin, hoarseness of voice, cold intolerance and constipation. Common signs found in hypothyroid patients were coarse dry skin (35%), alopecia (38%) and hoarseness of voice (18%). Among hyperthyroid symptoms most common were oligomenorrhea (32%), fatigue& weakness (8%), hyper-activity and irritability (74%). Common hyperthyroid signs were tachycardia (2%), warm moist skin (7%).

Most common menstrual disorder observed in the study was menorrhagia which was seen in 56% of patients. 32% of patients had oligomenorrhea, 19% had irregular cycles and 15% had normal cycles. In a study done by Yoko Kakuno et al, was found that

patients with severe hyperthyroidism showed a higher prevalence of amenorrhea (2.5%) and hypomenorrhea (3.7%).[17] Patients with severe hypothyroidism had a higher prevalence (34.8%) of menstrual disturbances. Joshi et al. found that only 31.8% of hypothyroid and 35.3% of hyperthyroid women had a normal menstrual pattern, in contrast to 56.3% of Euthyroid Women and 87.8% of healthy controls ($p < 0.001$).

Common perimenopausal symptoms observed in patients of thyroid dysfunction were menstrual disturbances (88%), weight gain (65%), mood swings& irritability (74%), anxiety and depression (61%), loss of libido (5%). Hernandez Valencia et al, in their study found that Climacteric symptoms are more intense in patients with hypothyroidism, but they fall when euthyroidism is maintained.[18] These changes in thyroid function can be associated with changes in estrogen concentrations, and therefore, in direct relation to the TRH neurohormone (thyroid-releasing hormone). A limitation of this study is that it is a single-center study, the results cannot be generalized.

CONCLUSION

In this study, hypothyroidism was found to be common thyroid dysfunction among perimenopausal women. Highest occurrence of thyroid dysfunction was observed in the age group of 40-45 years. Common menstrual disorder observed was menorrhagia followed by oligomenorrhea. Common perimenopausal symptoms observed in hypothyroid patients were menorrhagia, slowness, lethargy, weight gain and depression and in hyperthyroid patients were oligomenorrhea, mood swings, irritability and loss of libido. Thyroid dysfunction is common in perimenopausal women & the symptoms of thyroid dysfunction mimic the symptoms of perimenopausal hormonal fluctuations. Women of perimenopausal age group should be screened for thyroid dysfunction as this will prevent the consequences of overt thyroid disorders. This will also avoid unnecessary hormonal treatment for perimenopausal symptoms and its consequences.

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