Thyroid profile in perimenopausal women: A study to rule out hypothyroidism in the subclinical stage and its relationship to cholesterol levels

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ABSTRACT

Background: One of the most frequent problems affecting perimenopausal women is thyroid dysfunction, symptoms of which might be so subtle that they go unrecognized for a long time. In older women, subclinical hypothyroidism (SCH) is frequent. A significant percentage of individuals are at risk of developing primary hypothyroidism as a result of their SCH.

Aim and Objectives: The goal of this study is to know the incidence of thyroid dysfunction and its clinical manifestations, to determine thyroid profile the incidence of SCH, and its relation with the cholesterol levels in perimenopausal women in patients who visit gynecology outpatient department.

Materials and Methods: The present study is a descriptive cross-sectional research undertaken in the department of the research comprised 100 women between the ages of 40 and 55 Patients were assessed using a complete history, clinical examination, and laboratory tests such as ELISA was used to test thyroid function in the serum of all patients diagnosed with SCH and also assessed serum cholesterol in patients with SCH.

Results: There were 100 patients in the present study and all were women between the ages of 40 and 55. Menorrhagia was the most common menstrual disorder seen in the study group, with 56% of patients experiencing it. 32% of patients developed oligomenorrhea, which is one of the most common perimenopausal symptoms. Menstrual irregularities (88%) and weight increase were common symptoms in thyroid insufficiency individuals. (65%), irritation and mood changes (74%) Anxiety and sadness (61%) are the most common symptoms, followed by loss of employment. Sexual libido (5%) Subjects with normal free t3 and t4 but increased serum thyroid-stimulating hormone were classified as SCH. 20 of the patients had SCH, 4 had overt hypothyroidism, and the other 76 were euthyroid. Seventy-five percent of the patients with SCH had hypercholesterolemia when they were diagnosed.

Conclusion: We propose that perimenopausal women with or without symptoms be routinely screened based on the findings of this study. Early diagnosis and treatment of these issues will aid in lowering morbidity and preventing subsequent consequences.

KEY WORDS: Thyroid Dysfunction; Perimenopausal Women; Subclinical Hypothyroidism

INTRODUCTION

Perimenopause is a critical period in a woman’s life. During this time, women are exposed to a variety of social and psychological stressors. Women are prone to a variety of diseases due to external stress factors and variable hormone levels. Perimenopause is the time between menopause and menopause (40–55 years).[1] This includes the time leading up to menopause, when endocrinological, biological, and clinical signs of impending menopause appear, as well as the 1 year following menopause. This is the situation changes from regular ovulatory cycles to irregular ovulatory cycles are part of a natural transition period.

Thyroid problem is believed to be the most frequent endocrine ailment in India. Thyroid disease affects around 42 million people across India.[2] Thyroid problems’ symptoms
are frequently so subtle that they go overlooked. Thyroid problems and perimenopausal hormonal swings can cause a variety of symptoms, including obesity, menstruation abnormalities, dry skin, anxiety, sadness, etc.[3] Evidence suggests that people with SCH have a higher risk of cardiovascular death.[4] Even when symptoms are caused by thyroid disease, perimenopausal hormone changes are frequently blamed. This results in the use of unneeded drugs and the lack of necessary therapy. Subclinical hypothyroidism (SCH) may arise from such a similar strategy. SCH is defined as increased levels of thyroid-stimulating hormone (TSH) with normal levels of free triiodothyronine (fT3) and free thyroxine (fT4).[5]

The rising age is one of the predisposing factors for fast advancement. Elderly women are more likely to have SCH.[6] This condition affects 17% of older women in the United States.[7] SCH had advanced to overt hypothyroidism at a rate of 3TO18 percent each year in women.[8] Cholesterol levels in SCH patients have been found to be higher.[9] A new Rotterdam research found a stronger link between SCH and aortic atherosclerosis and myocardial infarction. According to reports, every one microunit per milliliter increase in serum TSH causes an increase in cholesterol of about 0.09 millimoles per L, or three to five milligrams per deciliter in women.[10]

Despite the fact that some research shows that SCH is linked to higher cholesterol levels, other studies contradict this claim. The goal of this study was to examine the relationship between SCH and cholesterol levels, as well as the prevalence of SCH in perimenopausal women.

**MATERIALS AND METHODS**

This cross-sectional study was conducted at the department after receiving clearance from the institutional ethics council and after examining the Inclusion and Exclusion Criteria. The research comprised 100 women between the ages of 40 and 55 who had just been diagnosed with thyroid disease. Patients were assessed using a comprehensive history and clinical examination. For laboratory investigations, 5 ml of venous blood is drawn from the median cubital vein in a simple sterile test tube after the patient is kept in a comfortable position and fasted. There are no anticoagulants or chemicals in it. The sample is permitted to coagulate without being disturbed. Centrifugation is then used to separate the serum. T3, T4, and TSH were measured using the ELISA technique,[11] and cholesterol was measured using the cholesterol oxidase-peroxidase method.[12]

Ethical approval was granted by the Institutional Ethics Committee. All the data were entered and analyzed by using statistical packages for social science software version 20.

**RESULTS**

This study enlisted the participation of 100 people. 31 of them are between the ages of 40 and 45, 40 are between the ages of 46 and 50, and the remaining 29 are between the ages of 51 and 55. The participants in the research were 40 years old on average and 55 years old on average [Table 1]. In our study, the prevalence of SCH in perimenopausal women noticed in 20 people (20%), 4 person (4%) had overt hypothyroidism, and the remaining 76 people (76%) were normal, as depicted in the pie diagram [Figure 1].

Menorrhagia was the most frequent menstrual issue reported in the research, with 54% of individuals experiencing it. Oligomenorrhea affected 22% of patients, whereas irregular periods affected 16% and normal cycles affected 8% [Figure 2].

<table>
<thead>
<tr>
<th>Age in years</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>40–45</td>
<td>31</td>
</tr>
<tr>
<td>46–50</td>
<td>40</td>
</tr>
<tr>
<td>51–55</td>
<td>29</td>
</tr>
</tbody>
</table>

**Table 1: Age distribution in years**

**Figure 1: Prevalance of thyroid dysfunction**

**Figure 2: Menstrual disorders**
(23%), and menstruation abnormalities were the most often seen hypothyroid symptoms (88%).

Dry skin, hoarseness of voice, cold sensitivity, and constipation were less prevalent hypothyroidism symptoms. Coarse, dry skin (30%), baldness (40%), and hoarseness of voice were also common symptoms in hypothyroid individuals (18%) [Table 2].

With a mean and standard deviation of 3.62 and 1.00, the lowest serum free T3 level is 1.06 pmols/L and the highest is 6.2 pmols/L. With a mean and standard deviation of 14.28 and 3.27, serum-free T4 levels range from 3.14 pmols/L to 21.64 pmols/L. TSH levels in the blood range from 1 mIU/L to 32.24 mIU/L, with a mean and standard deviation of 4.3 and 5.68, respectively [Table 3].

Seventy-five patients (70%) with SCH had higher blood total cholesterol levels, whereas the remaining three (30%) had normal serum total cholesterol levels, as shown in the pie diagram. 75% of the patients identified with SCH had hypercholesterolemia, which has a statistically significant link to SCH.

**DISCUSSION**

SCH is a kind of thyroid dysfunction in which the level of TSH in the blood is elevated despite normal freeT3 and freeT4 levels.[5] Clinical and biochemical alterations in SCH differ from one person to the next. Some people may experience just minor symptoms, while others may be badly afflicted. Despite the fact that SCH is primarily based on the molecular profile, some people show signs and symptoms of hypothyroidism.[13] SCH, also known as mild thyroid insufficiency, decreased thyroid reserve, or preclinical hypothyroidism, is the earliest type of hypothyroidism.[14]

Since SCH is uncommon in younger age groups and the prevalence is low in males, and because there is no well-defined treatment for irregularities in cholesterol in younger age groups, we concentrated our research on perimenopausal women aged 40–55. The frequency of SCH varies according to the population’s age, gender, ethnicity, race, socioeconomic position, and dietary choices. Perimenopausal women have a prevalence of 20%, according to our research.

In our study, the prevalence is rather high, and it corresponds to several other studies. In one study, the frequency was observed to be 23.9% in a group with high iodine consumption and 4.2% in a community with low iodine consumption.[15]

Menorrhagia was the most frequent menstrual issue reported in the research, with 54% of individuals experiencing it. Oligomenorrhea affected 22% of patients, whereas irregular periods affected 16% and normal cycles affected 8%.

Patients with severe hyperthyroidism had a greater frequency of amenorrhea (2.5%) and hypomenorrhea (2.5%), according to a research by Kakuno et al. (3.7%). Menstrual abnormalities were more common (34.8%) in patients with severe hypothyroidism.[16] Krassas et al.[17] discovered irregular cycles in 46 of 214 hyperthyroid women (22%); 24 of 214 hyperthyroid women had normal periods. There were 15 cases of hypomenorrhea, 15 cases of polymenorrhoea, five cases of oligomenorrhoea, two cases of menorrhagia, and no cases of amenorrhea.

For diagnosing SCH, several studies use different TSH cutoff levels. The reference TSH cutoff value, according to Nystrom et al. research, is more than 8 mIU/L.[18] In this investigation, a serum TSH value of 6.16 mIU/L was deemed normal, as were serum freeT3 and free T4 concentrations of 6.2 pmols/L and 22.74 pmols/L, respectively. As a result, any rise in serum TSH values exceeding 6.13 mIU/L with serum fT3 and fT4 levels within normal ranges was considered a case of SCH. SCH is thought to impact almost 20 million individuals in the European Union and around 14 million in the United States. Due to the widespread availability of TSH monitoring, the number of patients with SCH has grown globally.[19]

For any thyroid issue that goes undiagnosed might lead to difficulties.

**Table 2:** Clinical characteristics of thyroid dysfunction

<table>
<thead>
<tr>
<th>Hypothyroid symptoms</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiredness</td>
<td>74</td>
<td>74</td>
</tr>
<tr>
<td>Lethargy</td>
<td>78</td>
<td>78</td>
</tr>
<tr>
<td>Slowness</td>
<td>44</td>
<td>44</td>
</tr>
<tr>
<td>Cold intolerance</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Hair loss</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Poor memory</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Constipation</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Weight gain</td>
<td>68</td>
<td>68</td>
</tr>
<tr>
<td>Hoarsness of voice</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Menorrhagia</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>Oligomenorrhoea</td>
<td>32</td>
<td>32</td>
</tr>
</tbody>
</table>

**Table 3:** Prevalence of subclinical hypothyroidism in perimenopausal women (40–55 years)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Patients</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation (±)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>100</td>
<td>40</td>
<td>55</td>
<td>48.3</td>
<td>4.05</td>
</tr>
<tr>
<td>FreeT3 (serum)</td>
<td>100</td>
<td>1.06</td>
<td>6.13</td>
<td>3.27</td>
<td>1.00</td>
</tr>
<tr>
<td>FreeT4 (serum)</td>
<td>100</td>
<td>3.62</td>
<td>22.74</td>
<td>14.28</td>
<td>3.36</td>
</tr>
<tr>
<td>TSH (serum)</td>
<td>60</td>
<td>1</td>
<td>32.24</td>
<td>4.3</td>
<td>5.68</td>
</tr>
</tbody>
</table>
and worsen the individual’s regular health and well-being. As a result, thyroid profiles should be included in the evaluation of all patients who visit the outpatient department of various departments, and thyroid dysfunction should be corrected as soon as possible to avoid consequences.

CONCLUSION

Early diagnosis and treatment of these issues will assist to reduce morbidity and mortality avoiding any more issues. The greatest risk factor for atherosclerosis and myocardial infarction is the large increase in the prevalence of SCH and its accompanying hypercholesterolemia.[11] Hyperlipidemia has been linked to an increase in morbidity in SCH, particularly among middle-aged women, and the majority of them are unaware of it. Thyroid problems screening in the perimenopausal age range will aid in the discovery of subclinical thyroid malfunction and the diagnosis of overt disease. This proactive measure will have a huge impact. Function in extending the time of peak physical energy and good physical and mental performance mental well-being this will also assist women in navigating the perimenopausal period with ease during your life and avoid using drugs that you do not need.

REFERENCES


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