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Original Research Article

Study on the Thyroid Profile in Females of Early Reproductive Age Group Attending Gynaecology Outpatient Department in a Tertiary Care Medical College and Hospital of Assam, India

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Conflict of interest: Nil

Abstract

Background: Thyroid hormones play a crucial role in growth, development, and overall metabolic function. Both hyperthyroidism and hypothyroidism can result in menstrual irregularities and reproductive health issues. Thyroid disorders accounts for around 11-13% in female population of reproductive age group.

Aim: This study aims to evaluate thyroid profile in female patients in the age group of 15-24 years of age attending gynaecology OPD of a tertiary care medical college hospital.

Method: An observational, cross-sectional study of 100 female patients of early reproductive age group attending gynaecology OPD fulfilling the inclusion criteria was conducted. Serum TSH, FT3 and FT4 tests were done in the study participants after taking informed consent. Consecutive sampling method was used. Statistical analysis was performed using SPSS software (version 21.0). Categorical data was expressed as frequency and percentage, while continuous data was expressed as mean and standard deviation.

Result: Out of 100 patients, 16 were found to have high levels of TSH. Of the 16 hypothyroid patients, 10 (62.5%) were overt hypothyroidism and 6 (37.5%) subclinical hypothyroidism. Among the hypothyroid, 12 subjects were parous. Thus, these aids in risk stratification and management of thyroid disorders.

Conclusion: The prevalence of 16% thyroid disorders we found in our study were significantly higher than the prevalence of thyroid disorders in India which is around 11-13%. Hence, all females in young reproductive age group attending gynaecology OPD must be screened for thyroid disorders.

Keywords: Female, Hypothyroidism, Reproductive age group, Hyperthyroidism.

Introduction

The thyroid gland is crucial for growth, development, metabolism, and the functioning of all body organs. Thyroid problems represent the most prevalent endocrine disorders among females, impacting around 14% of adult women, and rank among the most frequent endocrinopathies in women of reproductive age [1].

The National Family Health Survey IV (2015-2016) indicated a 2.2% prevalence of goiter or thyroid disorders among adults aged 15-49, with approximately 2% in females and under 1% in males.

The incidence escalated with age in women (15-19 years: 0.7%; 20-34 years: 1.8%; 35-49 years: 3.4%). The prevalence rose to 2.9% in NFHS-V (2019-2021) [2]. Both hyperthyroidism and hypothyroidism can result in menstrual irregularities and reproductive health issues. If thyroid conditions go undiagnosed and untreated, they may lead to infertility or reduced fertility.

These disorders have significant medical, economic, and psychological effects on society, with a higher prevalence noted among females, particularly increasing with age; approximately 26% of women are affected.

Thyroid problems adversely affect ovarian function and pregnancy, influenced by factors such as autoimmune thyroid disease (AITD), low human chorionic gonadotropin (hCG) levels, inadequate iodine consumption, body mass index (BMI), ethnicity, and subclinical hypothyroidism status [3]. Subclinical hypothyroidism can result in

menorrhagia and oligomenorrhea, while thyrotoxicosis is typically linked to hypomenorrhea and polymenorrhea. Thyroid hormones directly and indirectly influence menstrual patterns. Women do various essential roles within a family, mainly as mothers and homemakers, while also contributing significantly as agricultural producers, wage earners, and nutrition providers.

They are crucial in obtaining, preparing, storing, and distributing food. Therefore, enhancing the status of women in aspects such as health and economic empowerment can lead to a better world, a brighter future for our children, and increased opportunities for development and peace. This concerns we as medical practitioners to investigate women's awareness of nutrition, common health issues, and personal hygiene practices related to eating, cooking, and bathing, to understand the primary factors contributing to health deterioration among women.

Many women have limited awareness regarding nutrients, the functions of food, food sources, and balanced diets. Common health issues among many women include iodine deficiency leading to thyroid problems, bone pain, and osteoporosis, therefore, it is crucial to recognize local socio-cultural beliefs and practices and to implement nutritional intervention programs aimed at enhancing nutritional knowledge and practices, which will ultimately improve the health of women in rural as well as urban areas.

Menstrual disorders are among the most common gynecological issues, followed by vaginal discharge and ovarian tumors. Abnormalities may include amenorrhea, irregular menstruation, and dysmenorrhea, with dysfunctional uterine bleeding being the leading cause of irregular periods in younger women [4].

The majority of patients experiencing menstrual irregularities are aged 15-24 years, comprising 56.8%, followed by those aged 32-40 years at 20.4%. Hypothyroidism occurs in 8.8% of women with menorrhagia and in about 4.0% of females are seen to be affected with amenorrhea.

Hyperthyroidism is seen in about 5.6% of women who seem to be presented with oligomenorrhea.

The prevalence of hypothyroidism in the fertile age group of young females is seen to be between 2-4%. Fertility may be impaired in the presence of hypothyroidism mainly due to anovulatory cycles, luteal phase defects, and an imbalance in sex hormones [5].

On the basis of above mentioned observations, this study aims to evaluate the thyroid profile status in young female patients of reproductive age group attending the Gynaecology department and to study the association of gynaecological symptoms with thyroid status.

Materials and Methods

This observational cross-sectional study was conducted over a period of one year (June, 2023 to August, 2024) in the Department of Biochemistry in collaboration with Department of Obstetrics & Gynaecology, Fakhruddin Ali Ahmed Medical College & Hospital, and Barpeta, Assam.

Prior approval was taken before conducting this from the Institutional Ethics Committee of FAAMCH, Barpeta. Written informed consent was obtained from the guardian of each patient after explaining the study procedure to them in their own understandable language. They had full liberty to withdraw from study at any stage.

The sample size was calculated by Leslie Kish formula. This was adjusted to the available population according to the clinical records and a sample size of 100 patients was obtained by consecutive sampling method from the Department of Gynaecology fulfilling the inclusion criteria.

Inclusion Criteria:

1. Females of youth age group
2. Females with Known last menstrual period

Exclusion Criteria:

1. <15 years and >24 year of age
2. Known metabolic disorder
3. Already diagnosed case of thyroid disorder
4. Terminally ill patients
5. Patient under medications like amiadarone, antithyroid drugs etc
6. Patient undertaking radiation therapy
7. Patient not willing to give consent

Study procedure: Patients fulfilling the inclusion criteria was scrutinized and enrolled for the study. Detailed study process was explained to the Parent/Guardian.

If consenting, written consent (bilingual) was obtained as per evaluated designed Proforma. Thorough clinical history was noted, and clinical examination was done.

Intravenous blood sample of 2ml was collected under all aseptic and antiseptic conditions in a clot-activator vial. All the investigations were done on the same day of sample collection.

Biochemical investigations: The required Biochemical tests needed for this study was done in the Central Clinical laboratory (CCL) of Department of Biochemistry, Fakhruddin Ali Ahmed Medical College and Hospital, Barpeta using Automated Biochemical Analyzer (VITROS 5600 Integrated System & Analyzer).

The following parameters are assessed for each case:

3. Serum TSH by Enhanced Chemiluminescence Immunoassay method
4. Serum freeT_3 by Enhanced Chemilumine scence Immunoassay method
5. Serum free T_4 by Enhanced Chemilumine scence Immunoassay method

Statistical Analysis: Data was compiled using MS Excel and statistical analysis was done using the computer program, Statistical Package for Social Sciences (SPSS for Windows, version 21.0 Chicago, SPSS Inc.) software.

Results

From this study, it was found that the thyroid disorder found in young females of reproductive age group was hypothyroidism.

Figure-1 shows that the prevalence of hypothyroidism in young females of reproductive age group between 15 to 24 years is 16% which is statistically significant with a p-value of <0.05.

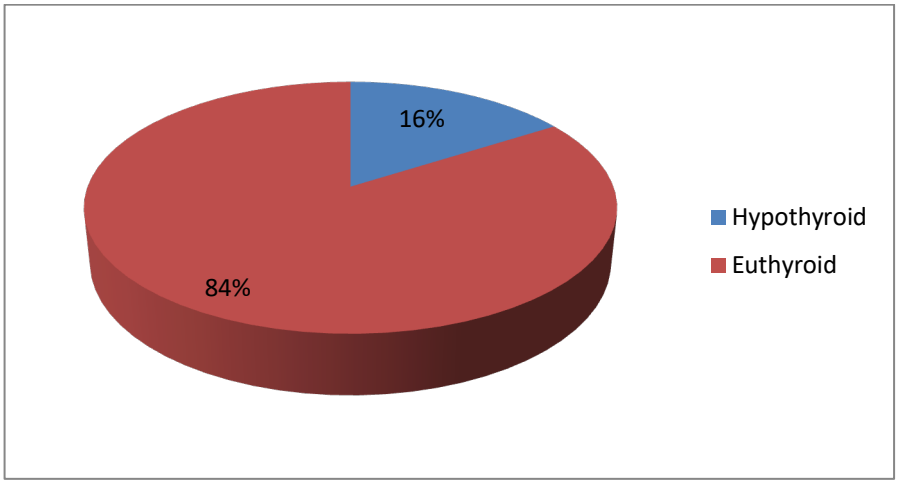

Figure 1: Prevalence of hypothyroidism in young females of reproductive age group

Age distribution: Table-1 shows that the prevalence of hypothyroidism was higher in the age group of 20 – 24 years (68.75%) than the younger age group of 15 – 19 years (31.25%) with a p-value of <0.05 which is statistically significant.

Table 1: Distribution of hypothyroidism in different age groups

Age group (in years)	Hypothyroid	Percentage
15 - 19	5	31.25
20 - 24	11	68.75
Total	16	100

Table-2 shows that prevalence of overt hypothyroidism (62.5%) is more than that of subclinical hypothyroidism (37.5%) with a p-value of <0.05 which is statistically significant.

Table 2: Distribution of overt and subclinical hypothyroidism

Type	Prevalence	Percentage
Overt hypothyroidism	10	62.5
Subclinical hypothyroidism	6	37.5
Total	16	100

Table-3 shows that among presenting symptoms in patients with hypothyroidism, most common presenting symptoms are menorrhagia and irregular menstruation followed by vaginal discharge, polymenorrhoea and dysmenorrhoea.

Table 3: Distribution of symptoms in hypothyroid patients.

Symptoms	Number of hypothyroid cases	Percentage
Irregular menstruation	4	25
Menorrhagia	4	25
Vaginal discharge	3	18.75
Polymenorrhoea	3	18.75
Dysmenorrhoea	2	12.5
Total	16	100

Table-4 shows that out of 36 parous women 12 are hypothyroid and out of 64 nulliparous women, 4 are hypothyroid which is statistically significant with a p-value of <0.05.

Table 4: Prevalence of hypothyroidism in parous and nulliparous women

Group	Parous	Nulliparous	Total
Hypothyroid	12	4	16
Non hypothyroid	24	60	84
Total	36	64	100

Discussion

The purpose of this study is to investigate the prevalence of thyroid problems and associated symptoms in women in the early reproductive age range (15–24 years old) who visit gynaecology patient departments. We found that the prevalence of hypothyroidism in young females of reproductive age group is 16%. Unnikrishnan AG et al also indicated that hypothyroidism is common among adults, with a three-fold greater prevalence in females (15.86% compared to 5.02%) and a two-fold higher frequency in older persons (13.11% compared to 7.53%) [6]. Our study also got the similar findings with higher prevalence of hypothyroidism in the age group of 20-24 years compared to that of 15-19 years.

Furthermore, it has been found in this study that there is higher prevalence of hypothyroidism in parous females than nulliparous females. Out of 36 parous women in the study, 12 were hypothyroid, whereas out of 64 nulliparous women, only 4 were hypothyroid. A study by Dhanwal DK et al found that 13.3% pregnant women attending secondary and tertiary public hospitals have hypothyroidism majority being subclinical [7]. Phukan JK et al reported prevalence of 87% hypothyroidism in parous women [8]. Goswami B et al found maximum hypothyroidism cases (38%) in parity 1–3 and 29% cases in Parity 4 and above [9]. According to Patel et al, it was seen that dysfunctional menstruation happens to be more common among the parous women than in nulliparous women [10].When a hypothyroid woman becomes parous, thyroid malfunction can have a variety of negative repercussions on the mother and the foetus. In the mother, thyroid dysfunction can increase the risk of abortion, anaemia, preeclampsia, placental abruption, and postpartum haemorrhage. While in the foetus, thyroid dysfunction can increase the risk of low birth weight, intrauterine growth retardation, stillbirth, preterm delivery, and congenital anomalies. It can also lead to reduced intellectual function and cretinism in the baby. Adult hypothyroidism can be difficult to diagnose since it presents with a variety of non-specific symptoms at first. In people with healthy thyroid function, many of the typical indications and symptoms of hypothyroidism often present. While common symptoms like weakness, sleeplessness, and memory loss are typically associated with aging, common symptoms like weariness, lethargy, and constipation have minimal diagnostic significance. Goswami B et al the incidence of the menstrual abnormalities was highest in 20–40 years age group and 8.5% in 15–20 years age group [9]. Ghosh et al found that 38% of their cases presented with menorrhagia [11]. Phukan JK et al also observed menorrhagia (51%) as the most common abnormality [8]. In our study among the hypothyroid patients, the most common presenting symptoms in the gynaecological OPD are irregular menstruation (25%) and menorrhagia (25%). Both the polymenorrhagia (19%) and vaginal discharge (19%) were the second most common irregularity in the present study, which correlates well with the findings of 16% cases of metrorrhagia, by Baruah P et al [12]. The best screening tool for thyroid dysfunction is considered to be TSH levels. Increased values usually indicate hypothyroidism whereas decreased values indicate hyperthyroidism. However, some patients have high TSH values but normal values of T3 and T4 hormones. Subclinical hypothyroidism is the term used to describe this condition, which is marked by a high TSH level and a normal free T4 level. As the thyroid gland fails, the TSH level may rise above the upper limit of normal when the free T4 level has fallen only slightly and is still within the normal range. The elevation of TSH levels is a reflection of the hypothalamic-pituitary axis' sensitivity to small decreases in circulating thyroid hormone.

Conclusion:

Present study provides valuable insights into the prevalence and characteristics of hypothyroidism in patients with gynaecological symptoms. The findings reveal a significant prevalence of hypothyroidism (16%) among these patients, highlighting the importance of regular thyroid function monitoring in this population. The current study emphasizes that thyroid dysfunction is a significant factor affecting women's overall health. Therefore, biochemical assessments of serum FT3, FT4, and TSH should be required in cases of suspicion to identify both evident and hidden thyroid issues and to reduce unnecessary surgical interventions. Present study demonstrates strong associations between hypothyroidism and several clinical parameters of female reproductive health.

This study aimed to evaluate awareness regarding various aspects of thyroid diseases. It recommends that health policymakers implement more effective educational sessions to enhance the general population's and caregivers' knowledge about thyroid disorders and the importance of adherence to treatment.

Since female health related issues arising due to thyroid hormones dysfunction is quite common in the society which is evident from previous as well as this present study, it is therefore the need of the hour to create massive awareness about thyroid hormones and its direct relation and effects on the female overall health, about the basic understanding of thyroid health in schools, society, educational meet ups, Anganwadi and so on. Early detection and management of thyroid dysfunction in these patients could potentially improve overall outcomes and quality of life. Further research is warranted to elucidate the mechanisms underlying this association and to develop targeted interventions for this vulnerable population.

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