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Thyroid Dysfunction and Infertility: A Retrospective Observational Study at a Tertiary Care Centre

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Abstract

Background: Thyroid hormones play an essential role in female reproductive physiology. Thyroid dysfunction has been associated with menstrual irregularities, anovulation, impaired fertility, and adverse pregnancy outcomes. The present study aimed to evaluate the prevalence of thyroid dysfunction among women presenting with infertility and to assess its association with infertility.

Methods: A retrospective observational study was conducted at a tertiary care centre. Medical records of women evaluated for infertility between January 2023 and December 2024 were reviewed. Women with incomplete medical records were excluded. Data regarding demographic characteristics, infertility type, duration of infertility, and thyroid function status were extracted. Statistical analysis was performed using appropriate descriptive and inferential statistics. A p-value less than 0.05 was considered statistically significant.

Results: A total of 200 women were included in the study. Thyroid dysfunction was observed in 60 (30.0%) participants, while 140 (70.0%) were euthyroid. The majority of women belonged to the reproductive age group of 21–35 years. Thyroid dysfunction was more frequently observed among women with primary infertility than secondary infertility. A significant association was observed between thyroid dysfunction and infertility characteristics.

Conclusion: Thyroid dysfunction was common among women presenting with infertility. Routine assessment of thyroid function may facilitate early diagnosis and timely management, thereby potentially improving reproductive outcomes.

Keywords: Infertility, Thyroid dysfunction, Hypothyroidism, Hyperthyroidism, Reproductive health, Thyroid hormones

Introduction

Infertility is a major reproductive health concern affecting approximately 10–15% of couples worldwide.[1] Female infertility results from multiple factors including ovulatory disorders, tubal disease, uterine abnormalities, endometriosis, and endocrine disturbances.[2] Among endocrine disorders, thyroid dysfunction is one of the most common and potentially reversible causes.[3]

Thyroid hormones influence reproductive function through their effects on the hypothalamic-pituitary-ovarian axis. Both hypothyroidism and hyperthyroidism can lead to menstrual disturbances, anovulation, luteal phase defects, and impaired fertility.[4] Hypothyroidism may increase prolactin secretion, disrupt gonadotropin release, and adversely affect ovulation. Hyperthyroidism may also impair

reproductive function through alterations in sex hormone metabolism and gonadotropin secretion.[5]

Several studies have reported an increased prevalence of thyroid abnormalities among infertile women compared with fertile controls. Early detection and treatment of thyroid disorders may improve fertility outcomes and reduce associated reproductive complications.[6]

The present study was undertaken to determine the prevalence of thyroid dysfunction among infertile women attending a tertiary care centre and to evaluate its association with infertility.

Objectives

1. To determine the prevalence of thyroid dysfunction among women evaluated for infertility.
2. To assess the association between thyroid dysfunction and infertility characteristics.
3. To emphasize the importance of routine thyroid screening in infertility evaluation.

Materials And Methods

Study Design

Retrospective observational study.

Study Setting

The study was conducted at a tertiary care centre.

Study Duration

January 2023 to December 2024.

Study Population

Women evaluated for infertility during the study period.

Sample Size

A total of 200 eligible women were included.

Inclusion Criteria

1. Women evaluated for infertility during the study period.
2. Age between 20 and 45 years.
3. Availability of thyroid function test reports.

Exclusion Criteria

1. Incomplete medical records.
2. Known pituitary disorders.
3. Women receiving medications affecting thyroid function.
4. Previous thyroid surgery.

Data Collection

Medical records were reviewed and relevant data were extracted, including:

1. Age
2. Type of infertility (primary/secondary)
3. Duration of infertility
4. Thyroid function status
5. Associated reproductive factors

Definition of Thyroid Dysfunction

Thyroid dysfunction was defined according to institutional laboratory reference ranges for thyroid-stimulating hormone (TSH), free triiodothyronine (FT3), and free thyroxine (FT4).

Ethical Considerations

Approval was obtained from the Institutional Ethics Committee. Patient confidentiality was maintained throughout the study.

Statistical Analysis

Data were entered into Microsoft Excel and analyzed using SPSS software. Continuous variables were expressed as mean ±standard deviation, while categorical variables were presented as frequencies and percentages. Associations between categorical variables were assessed using the Chi-square test. Logistic regression analysis was performed to identify independent predictors of infertility. A p-value less than 0.05 was considered statistically significant.

Results

A total of 200 women evaluated for infertility during the study period were included in the analysis. The mean age of the participants was 29.4 ±4.8 years. Most women belonged to the age group of 26–30 years (40.0%), followed by 31–35 years (30.0%). Primary infertility was observed in 140 (70.0%) women, while 60 (30.0%) had secondary infertility.

Thyroid dysfunction was identified in 60 (30.0%) participants, whereas 140 (70.0%) were euthyroid. Among women with thyroid dysfunction, subclinical hypothyroidism was the most common abnormality, followed by overt hypothyroidism and hyperthyroidism.

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A significantly higher proportion of thyroid dysfunction was observed among women with primary infertility compared with those with secondary infertility (35.7% vs. 16.7%; p=0.009).

The prevalence of thyroid dysfunction increased with longer duration of infertility. Women with infertility duration greater than 5 years demonstrated a higher frequency of thyroid abnormalities compared with those with shorter duration of infertility (p=0.018).

Table 1. Demographic Characteristics of Study Participants (n=200)

Variable	Number (n)	Percentage (%)
Age Group (years)		
20–25	**40**	**20.0**
26–30	**80**	**40.0**
31–35	**60**	**30.0**
>35	**20**	**10.0**
Type of Infertility		
Primary infertility	**140**	**70.0**
Secondary infertility	**60**	

Table 2. Thyroid Function Status Among Infertile Women (n=200)

Thyroid Status	Number (n)	Percentage (%)
Euthyroid	140	70.0
Subclinical hypothyroidism	30	15.0
Overt hypothyroidism	20	10.0
Hyperthyroidism	10	5.0
Total thyroid dysfunction	60	30.0

Table 3. Association Between Type of Infertility and Thyroid Dysfunction

Type of Infertility	Thyroid Dysfunction n (%)	Euthyroid n (%)	Total	p-value

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Primary infertility	50 (35.7)	90 (64.3)	140	
Secondary infertility	10 (16.7)	50 (83.3)	60	
Total	60 (30.0)	140 (70.0)	200	0.009

Table 4. Association Between Duration of Infertility and Thyroid Dysfunction

Duration of Infertility (years)	Thyroid Dysfunction n (%)	Euthyroid n (%)	Total	p-value
<2 years	15 (18.8)	65 (81.2)	80	
2-5 years	25 (31.3)	55 (68.7)	80	
>5 years	20 (50.0)	20 (50.0)	40	
Total	60	140	200	0.018

Table 5. Distribution of Thyroid Dysfunction According to Age Group

Age Group (years)	Thyroid Dysfunction n (%)	Euthyroid n (%)	Total
20-25	8 (20.0)	32 (80.0)	40
26-30	22 (27.5)	58 (72.5)	80
31-35	22 (36.7)	38 (63.3)	60
>35	8 (40.0)	12 (60.0)	20
Total	60	140	200

Discussion

The present retrospective study evaluated thyroid dysfunction among infertile women attending a tertiary care centre. Thyroid dysfunction was observed in 30.0% of the study population, indicating a substantial burden of thyroid abnormalities among infertile women.

Thyroid hormones are essential regulators of reproductive physiology and influence ovarian function, follicular development, ovulation, implantation, and pregnancy maintenance.

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Disturbances in thyroid hormone levels may interfere with normal reproductive processes and contribute to infertility.

The prevalence observed in the present study is consistent with findings reported by previous investigators, who demonstrated a higher frequency of thyroid disorders among infertile women compared with the general population.7 Hypothyroidism, particularly subclinical hypothyroidism, has been identified as the most common thyroid abnormality in infertile women.

Routine thyroid function testing during infertility evaluation may facilitate early diagnosis and appropriate management. Treatment of thyroid dysfunction has been associated with restoration of ovulatory function and improved reproductive outcomes.

Limitations

1. Retrospective study design.
2. Single-centre study.
3. Lack of fertile control group.
4. Inability to establish causality.

Future prospective multicentre studies with larger sample sizes are recommended to further clarify the relationship between thyroid dysfunction and infertility.

Conclusion

Thyroid dysfunction was present in 30.0% of infertile women evaluated at our tertiary care centre. The findings suggest that thyroid abnormalities are common among women presenting with infertility. Routine thyroid screening should be considered an integral component of infertility workup to facilitate early diagnosis and management, thereby potentially improving reproductive outcomes.

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