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PREVALENCE OF HYPOTHYROIDISM IN INFERTILE WOMEN AND EVALUATION OF RESPONSE OF TREATMENT FOR HYPOTHYROIDISM ON INFERTILITY"

Obstetrics & Gynaecology

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ABSTRACT

Background - Infertility is a global health concern, affecting 8-10% of couples worldwide, with significant psychosocial implications for affected individuals. Thyroid dysfunction, particularly hypothyroidism, is a notable endocrine disorder contributing to infertility among women. **Material And Methods -** This prospective intervention study was conducted in the Department of Obstetrics and Gynecology at the Government Medical College, Kota, from October 2022 to April 2024, and included 210 infertile women aged 20-42 years attending the outpatient department. **Objectives** -The primary aim was to assess the prevalence of clinical and subclinical hypothyroidism among these women and to evaluate the efficacy of levothyroxine treatment in improving fertility outcomes. **Results** -Participants were classified based on thyroid function into three groups: euthyroid, subclinical hypothyroid, and overt hypothyroid. The study found that 23.8% of the infertile women had hypothyroidism, with 19.5% having subclinical hypothyroidism and 4.2% exhibiting overt hypothyroidism. The data indicated that subclinical hypothyroidism was more prevalent than overt hypothyroidism among infertile women. Levothyroxine treatment resulted in a conception rate of 70%, with the highest success observed in women with subclinical hypothyroidism (66%) compared to those with overt hypothyroidism (4%). **Conclusion** -The study highlights the crucial impact of thyroid dysfunction on fertility and supports routine screening of TSH and prolactin in infertile women. Early detection and treatment, especially with levothyroxine in subclinical hypothyroidism, can significantly improve pregnancy outcomes through a simple, cost-effective approach.

KEYWORDS

INTRODUCTION

Infertility, defined as the inability to conceive after 12 months of regular unprotected intercourse (WHO, 2019), affects around 8–10% of couples globally, with a significant burden in India[1]. It poses not only medical but also psychological and social challenges, especially for women. WHO data (2023) show that approximately 17.5% of adults worldwide experience infertility[2], with increasing prevalence in developing countries due to environmental, lifestyle, and healthcare disparities.

Among various causes, endocrine disorders—particularly thyroid dysfunction—play a crucial role in female infertility.Prevalence of hypothyroidism in the reproductive age group is 2–4% and has been shown to be the cause of infertility and habitual abortion[3,4].

Hypothyroidism, whether clinical or subclinical, disrupts the hypothalamic–pituitary–ovarian axis, alters gonadotropin secretion, and affects ovulatory function[5]. It may also elevate prolactin levels, further impairing fertility[6]. Symptoms may include menstrual irregularities, subfertility, and miscarriage. Subclinical hypothyroidism is more common and often remains undiagnosed, yet it can significantly affect reproductive outcomes.

Routine screening for thyroid function, including TSH and prolactin levels, is recommended in all women undergoing infertility evaluation.As per the American Thyroid Association Guidelines 2017[7], thyroid function should be tested in all infertile women seeking treatment which includes free T3, T4, thyroid stimulating hormone (TSH). Treatment with levothyroxine can restore normal ovulatory cycles and improve the chances of conception. However, data on the prevalence and treatment outcomes of hypothyroidism in infertile women from our region remain limited. Therefore, this study aims to assess the prevalence of hypothyroidism in infertile women and evaluate their response to thyroid hormone therapy.

MATERIALS AND METHODS

This prospective interventional study was conducted in the Department of Obstetrics and Gynaecology, Government Medical College, Kota, from October 2022 to April 2024. A total of 210 infertile women aged 20–42 years attending the infertility clinic were enrolled after obtaining informed consent. Ethical clearance was obtained from the Institutional Ethics Committee. Women visiting the clinic for the first time, evaluated for TSH and prolactin, were included. Exclusion criteria were tubal block, PID, endometriosis, genital TB, systemic diseases (hepatic, renal, cardiac), abnormal semen analysis in male partners, and those on treatment for hyperprolactinemia.

All participants underwent a detailed medical, surgical, and gynecological history along with physical examination including BMI, hair distribution, thyroid gland, and pelvic examination. Male factors were also evaluated and referred to urologists when needed. Basic investigations included CBC, serum TSH, prolactin, semen analysis, confirmation of ovulation, and tubal patency tests. On day 3 of the menstrual cycle, serum TSH and free T4 were tested using a third-generation electrochemiluminescence immunoassay (reference ranges: TSH <2.5[7] mIU/L[As per American thyroid association (ATA) and American association of clinical endocrinologists, (AACE)[8], Free T4: 0.8–2 ng/dL, Prolactin: 1.9–25 ng/mL).

Based on thyroid function, patients were categorized into three groups: Group 1 (euthyroid) – TSH 0.39–2.5 mIU/mL; Group 2 (subclinical hypothyroidism) – TSH 2.5–10 mIU/mL with normal free T4; Group 3 (overt hypothyroidism) – TSH >10 mIU/mL or TSH 2.5–10 mIU/mL with low free T4. Patients with hypothyroidism (subclinical or overt) were treated with levothyroxine (12.5–150 mcg/day), with dosage adjustments based on TSH monitoring at 6–8 week intervals. Fertility outcomes were assessed over a 12-month treatment period to evaluate response to therapy.

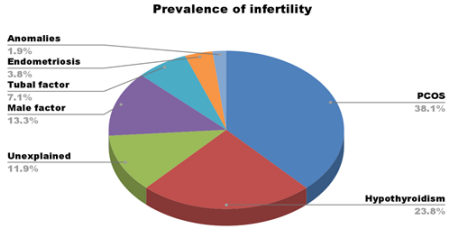
RESULTS;

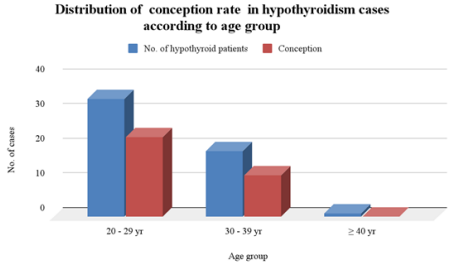
Among the 210 infertility cases studied, the most common cause was PCOS (38.09%), followed by hypothyroidism (23.80%), male factor (13.33%), unexplained infertility (11.90%), tubal factors (7.14%), endometriosis (3.81%), and anomalies (1.90%). Primary infertility was more prevalent (70.47%) compared to secondary (29.52%). Most patients (62.38%) were aged 20–29 years, with a mean age of 28.35 years, and the majority were from urban areas (77.14%) and Hindu religion (82.86%). Regarding literacy, 41.90% had primary education. Thyroid profile showed 77.14% euthyroid, 19.5% subclinical, and 4.2% overt hypothyroidism. Prolactin levels were normal in 88.57% and elevated in 11.42%. BMI distribution showed 49.04% were normal, 31.42% overweight, and 18.57% had class I obesity.

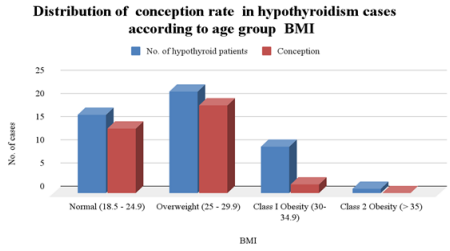
Out of 50 (23.80%) hypothyroid patients, 70% conceived post-treatment. Conception was higher in those aged 20–29 years (46%) and with normal (28%) or overweight BMI (38%), with significant

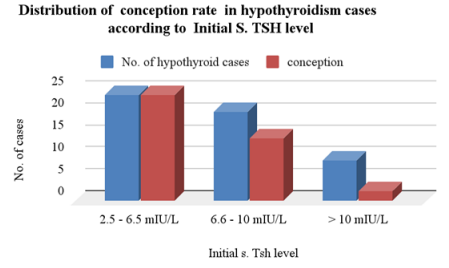
association (p=0.0004). Regular menstrual cycles were linked to better conception outcomes (40% vs. oligomenorrhea 28%, p=0.0166). Conception was better with infertility duration of less than 10 years and among subclinical hypothyroid cases (66% vs. 4% in overt, p=0.0006). Normal prolactin and lower initial TSH levels were significantly associated with better outcomes (p=0.0003 and <0.0001 respectively).Among 50 hypothyroid cases, conception occurred in 24/24 patients with TSH 2.5–6.5, 14/20 with TSH 6.6–10, and 2/9 with TSH >10, Primary and secondary infertility showed no significant difference in conception rate.

Regarding treatment duration, most conceptions occurred within 6 months to 1 year (42.9%), and 71.42% of pregnancies continued, while 28.57% ended in abortion. These findings suggest that early diagnosis and proper management of hypothyroidism and associated factors significantly improve conception outcomes in infertile patients.









DISCUSSION

Thyroid dysfunction, particularly hypothyroidism, affects fertility by increasing TRH, leading to elevated TSH and prolactin, which disrupt ovulation. Routine TSH and prolactin testing is essential in infertility workups. This prospective study analyzed the impact of hypothyroidism on infertility and evaluated treatment outcomes.

In the present study, 210 infertile women were included to assess the prevalence of hypothyroidism and its impact on infertility. Among them, 161 (76.2%) were euthyroid, and 49 (23.8%) were found to have thyroid dysfunction. Of these 49 cases, 41 (19.5%) had subclinical hypothyroidism and 8 (4.2%) had overt hypothyroidism. This is in concordance with a study by Dhanwal et al. (2013), who found 19.25% of infertile women had subclinical hypothyroidism and 4.25% had overt hypothyroidism. Sharma et al. (2019) also reported 28.9% of cases with subclinical hypothyroidism and 7.9% with overt hypothyroidism among infertile women. Tali et al. (2018) observed 21.4% of cases with subclinical hypothyroidism, while Verma et al. (2021) reported 27.2% had subclinical hypothyroidism and 2.4% overt hypothyroidism. These findings are consistent with the results of our study and support the view that thyroid dysfunction, especially subclinical hypothyroidism, is common in infertile women.

Hyperprolactinemia was seen in 24 out of 210 patients (11.4%) in our study. Among the 49 hypothyroid cases, 18 (36.7%) had associated hyperprolactinemia. In the euthyroid group, 6 out of 161 (3.7%) had hyperprolactinemia. Similar results were seen in a study by Pushpagiri et al. (2020), where 19% of women with infertility had hypothyroidism, and among them, 39.5% had elevated prolactin levels. Pradhan et al. found that 46.66% of hypothyroid cases had hyperprolactinemia. These findings are explained by the fact that in hypothyroidism, TRH increases which stimulates prolactin secretion leading to hyperprolactinemia, thereby affecting ovulation.

In our study, conception occurred in 26 out of 49 cases of hypothyroidism (53.06%) after treatment. Among these 26 conceived cases, 24 had subclinical hypothyroidism and 2 had overt hypothyroidism. Among the conceived cases, 61.53% were from the 20–29 age group. Maximum conception (76.9%) occurred in those with less than 5 years of infertility. This was supported by Verma et al. (2021), who reported 63.6% conception in 20–29 years group and 81.8% conception with infertility duration less than 5 years. Rijal et al. (2011) found 86.5% of infertile patients who conceived after treatment were aged 21–30 years, and 70.3% had infertility duration less than 5 years.

Among 26 conceived cases, 76.9% had regular menstruation and 84.61% had normal BMI (18.5–22.9). Maximum conception was seen in patients with TSH levels below 6.5 mIU/ml. Among patients with TSH levels between 2.5–4.9, 77.8% conceived, while only 25% with TSH 5.0–6.49 conceived. This highlights the importance of maintaining lower TSH levels for better fertility outcomes, as also observed by Sharma et al. (2020) who found 71.1% of conceived patients had TSH <5.5 mIU/ml. Agarwal et al. (2018) observed that pregnancy rates were significantly higher (52.73%) in women with TSH <6.5 mIU/ml than in women with TSH >6.5 mIU/ml (23.07%).

In our study, 84.6% of women who conceived were treated for more than 6 months, and 15.4% were treated for less than 6 months. Similar results were seen in a study by Singh et al. (2022), where 82.1% of patients treated for more than 6 months conceived compared to 17.9% of patients treated for less than 6 months. These results reflect that the probability of conception improves with increased duration of treatment and hormonal stabilization.

CONCLUSION

This study found a 23.80% prevalence of hypothyroidism in infertile women, with elevated prolactin levels affecting ovarian function and fertility. Lower education and rural background limited awareness and access to care. Normal weight women had higher conception rates than obese patients. Subclinical hypothyroidism was more common and linked to better outcomes than overt cases. Routine thyroid screening is essential in infertility evaluations.

REFERENCES

1. Zegers-Hochschild F, Adamson GD, Dyer S, Racowsky C, de Mouzon J, Sokol R, Rienzi L, Sunde A, Schmidt L, Cooke ID, Simpson JL, van der Poel S. The International Glossary on Infertility and Fertility Care, 2017. Hum Reprod. 2017 Sep 1;32(9):1786-1801.
2. World Health Organization. 1 in 6 people globally affected by infertility [Internet]. Available from: https://www.who.int/news/item/04-04-2023-1-in-6-people-globally-affected-by-infertility
3. Lincoln R, Ke RW, Kutteh WH. Screening for hypothyroidism in infertile women. J Reprod Med 1999;44:455-7.
4. Krassas GE. Thyroid disease and female reproduction. Fertil Steril 2000;74:1063-70.
5. Mikhael S, Punjala-Patel A, Gavrilova-Jordan L. Hypothalamic-pituitary-ovarian axis disorders impacting female fertility. Biomedicines. 2019 Jan 4;7(1):5.
6. Turankar S, Sonone K, Turankar A. Hyperprolactinaemia and its comparison with hypothyroidism in primary infertile women. J Clin Diagn Res. 2013 May;7(5):794–6. doi:10.7860/JCDR/2013/4878.2941. PMID: 23814712; PMCID: PMC3681039.
7. Alexander EK, Pearce EN, Brent GA, Brown RS, Chen H, Dosiou C, et al. Guidelines of the American Thyroid Association for the diagnosis and management of thyroid disease during pregnancy and the postpartum. Thyroid. 2017;27:315–89.
8. Cho MK. Thyroid dysfunction and subfertility. Clin Exp Reprod Med. 2015 Dec;42(4):131–5. doi:10.5653/cerm.2015.42.4.131. PMID: 26816871; PMCID: PMC4724596.