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

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**ABSTRACT**

**Context:** In the reproductive age group prevalence of hypothyroidism is 2–4% in the women. Due to anovulatory cycles, hyperprolactinemia, luteal phase defects and sex hormone imbalance hypothyroidism can affect fertility. **Aims and Objectives:** To study the prevalence of sub-clinical /clinical hypothyroidism in the infertile women. The response of treatment for hypothyroidism among these women. **Materials and Methods:** A total of 100 infertile women visiting the OPD in our rural institute for the first time were investigated for prolactin (PRL) and thyroid stimulating hormone (TSH). All infertile women with hypothyroidism with or without associated hyperprolactinemia were given treatment for hypothyroidism. Thyroxine 25–150 g was prescribed according to the need. **Results:** Of 100 infertile women, 24% were hypothyroid (i.e.TSH > 4.2 IU/ml). After successful treatment for hypothyroidism, 75% of infertile women got conceived in next 6 weeks to 1 year. Infertile women with both hyperprolactinemia and hypothyroidism also responded to treatment. Their PRL levels returned to normal. **Conclusion:** Measurement of PRL and TSH should be done at very early stage of infertility. In otherwise asymptomatic infertile women, oral hypothyroidism treatment for mere 3 months to 1 year can be of great benefit to conceive

**KEYWORDS :**

## INTRODUCTION

Infertility as well as sub-fertility can be caused by untreated and undiagnosed thyroid disease. In our society both of these conditions have important medical, psychology and economical implications. In various ways thyroid dysfunction can affect fertility resulting in high prolactin (PRL) levels anovulatory cycles, luteal phase defect and also sex hormone imbalances. Therefore, for fertility, pregnancy and to sustain a good healthy pregnancy normal thyroid function is must, even in the earliest days of pregnancy.

Thyroid evaluation must be done in any woman who wants pregnancy with irregular menstrual cycle, or had more than two miscarriages, is unable to conceive after one year of unprotected intercourse and family history of thyroid problems. The comprehensive thyroid evaluation must include $T_3$,$T_4$,TSH, and thyroid autoimmune testing like thyroid peroxidase (TPO) antibodies, antithyroglobin/thyroglobin antibodies, and also thyroid stimulating immunoglobulin (TSI). Included in the basic fertility workup thyroid autoimmune testing may or may not be included because the presence of thyroid antibodies doubles the risk of recurrent miscarriages in women with normal thyroid function.[1-3]

Hypothyroidism has prevalence in the reproductive age group is 2–4%. It has been shown to be the cause of infertility and habitual abortion.[4,5] By assessing TSH levels in the blood hypothyroidism can be easily detected. Normal $T_3$ and $T_4$ and slight increase in TSH levels indicates subclinical hypothyroidism. Levels accompanied by low $T_{4 and}$ $T_3$ levels with high TSH indicate clinical hypothyroidism.[6] Subclinical hypothyroidism is much more common. It can cause anovulation by causing elevation in PRL or directly. It is much important to treat the subclinical hypothyroidism for pregnancy and to also fo5r maintaining it unless there are other independent risk factors present. Associated hyperprolactinemia due to increased production of thyrotropin releasing hormone (TRH) in ovulatory dysfunction is present in many infertile women suffering from hypothyroidism [7,8].It has been recommended and emphesized that the treatment should be given to correct the hypothyroidism before evaluating any other causes of raised PRL in the presence of raised PRL. Measurement of PRL and TSH should be routinely done as a part of infertility workup. There is lack of population-based infertility data of women with subclinical hypothyroidism, Therefore we planned to study the prevalence of hypothyroidism in infertile women.as And also to assess their response to drug treatment given for hypothyroidism.

## MATERIALS AND METHODS

The study was conducted on 100 women (age group 20–40 years) on their first visit to Gynecology and Obstetrics OPD of our rural institures from September 2021 to September 2022. The study was conducted after taking written, informed consent of all the participants. Infertile women having pelvic inflammatory disease, tubular blockage, endometriosis, genital TB (PCR-positive); with renal, liver or cardiac diseases; those already on treatment for hyperprolactinemia and thyroid disorders; or cases where abnormality was also found in husband's semen analysis were altogether excluded from the study.

Routine investigations such as sugar (RBS), renal functions tests, complete hemogram, urine routine and culture if needed, and ultrasound were done. PRL and TSH were measured by the electrochemiluminesence as per the instruction manual for Elecsys, 2010 (Roche, USA). Normal TSH and PRL levels were respectively 0.27–4.2 IU/ml and 1.9–25 ng/ml, as per instruction of kit supplier. Therefore, hyperprolactinemia at PRL levels of >25 ng/ml and hypothyroidism at TSH levels of > 4.2 IU/ml was considered.

Thyroxine 25–150 g was then given to hypothyroid infertile females depending upon TSH levels. Using percentages statistical analysis of results was carried out.

## RESULTS

Of the 100 women enrolled for the study, 24 (24.00%) infertile women had raised TSH levels only, 13 (13..00%) infertile females had raised PRL levels only, and 5 (05.00%) infertile female have raised levels of both TSH and PRL, which may be due to pituitary and/or hypothalamic diseases. In 19 hypothyroid infertile females, the mean TSH levels were 8.34 ± 10.52 IU/ ml, and in 7 infertile women with hyperprolactinemia the mean PRL levels were 53.26 ± 47.17 ng/ml; and the difference in the levels of both these hormones in infertile women with hyperprolactinemia and/or hypothyroidism was highly significant compared to infertile women (with normal levels P < 0.001) as depicted in table 1. Hypothyroid infertile women depending upon the TSH levels, were further subdivided into 4–6 IU/ml) clinical (TSH > 6 IU/ml) and subclinical (TSH hypothyroidism. It was found that 19 of hypothyroid infertile women were with subclinical

and remaining 5 were with clinical hypothyroidism.

Of the 24 infertile women diagnosed with hypothyroidism alone or with hyperprolactinemia, 18 (75.00%) infertile women conceived after treatment for hypothyroidism (where dose was given depending upon severity of hypothyroidism by calculating TSH levels). Of these 18 women, 13 (72.20%) women conceived after 6 weeks to 3 months of therapy whereas 5 (27.70%) women conceived after 3 months to 1 year of therapy. We found that hypothyroid infertile patients with associated hyperprolactinemia also responded to treatment prescribed for hypothyroidism and they also conceived.

## DISCUSSION

Thyroid hormones have profound effects over reproduction and hence pregnancy. Thyroid dysfunction is implicated in reproductive disorders, ranging from menstrual irregularities and infertility to abnormal sexual development .[9,10] Hypothyroidism is associated with increased production of TRH. TRH stimulates pituitary to secrete PRL and TSH. Hyperprolactinemia also adversely affects fertility by impairing GnRH pulsatility and hence ovarian function.[2,11,12] Regardless of their menstrual rhythm gynecologists should check PRL and TSH and levels in every infertile female,

**Table 1: Serum thyroid stimulating hormone and prolactin levels in 100 infertile females**

| Hormone | Status | Number of patients, n=100(%) | Level of concerned hormone |
|---|---|---|---|
| TSH (μIU/ml) | Normal | 76(76.00%) | 2.16 ± 0.94 |
| | Hypothyroid | 24 (24.00%) | 8.34 ± 10.52* |
| Prolactin (ng/ml) | Normal | 82 (82.00%) | 12.85 ± 5.97 |
| | Hyperprolactinemia | 18(18.00%) | 53.26 ± 47.17* |

TSH:Thyroid stimulating hormone., P < 0.001 compared to normal

Couple's initial consultation for infertility in USA, TSH and PRL levels are always checked.[8] The prevalence of hyperprolactinemia was 18.00% whereas hypothyroidism was 24.00% in our study, which is higher than in USA. Again, prevalence of hyperprolactinemia was much higher in Iraq (60%) and even in Hyderabad, India, which is higher (41%) as compared to our present study. Hyperprolactinemia may result from stress. Variable prevalence may be due to the different stress levels in the different areas.[2,8]

Thyroid dysfunction is a common cause of infertility. This can be easily managed by correcting the levels of thyroid hormones.[11,13] It has been recommended that in the presence of raised PRL levels along with raised TSH, the treatment should be first to correct the hypothyroidism before any evaluation any further causes of hyperprolactinemia. In established hypothyroidism hormone therapy with thyroxine is the choice of treatment. It normalizes the PRL levels, menstrual cycle, and improves the fertility rate. Therefore, with simple oral treatment for hypothyroidism, 75.00% infertile women with hypothyroidism conceived after 6 weeks to 1 year of the therapy. We tried to maintain normal TSH levels where the compliance and adequacy of hypothyroid drug dose were checked by TSH measurements after the 6 to 8 weeks interval.

Normal TSH levels are therefore pre-requisite requirements for fertilization. In infertile women decision to initiate thyroid replacement therapy in subclinical hypothyroidism at the early stage is justified. Again, our data also indicate that variations in TSH levels in the narrower range i.e., 4–5, 5–6, and >6.0 IU/ml, must not be ignored in infertile women which are otherwise asymptomatic for clinical hypothyroidism. If only carefully diagnosed and treated for hypothyroidism this group of infertile women, can benefit a lot. We should plan further studies with the large sample size for better management of infertility cause. long-term follow-up is necessary to validate the variation in TSH and PRL levels.

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