

# FREQUENCY OF TSH DERANGEMENT IN SUBFERTILITY WORKUP

Jamila M. Naib, Syeda Sitwat Fatima, Talat Naz, Ejaz Hassan Khan

Department of Obstetrics and Gynaecology, Khyber Teaching Hospital, Peshawar - Pakistan

## ABSTRACT

**Objective:** To calculate frequency of thyroid dysfunction as aetiology of subfertility.

**Material and Methods:** A total of 320 infertile women were investigated for infertility and their TSH levels were done. Time period was a total of 9 months from April 2013 to December 2013 in a tertiary care outpatient setup. Those with derangement of TSH were then sent for full Thyroid profile. A standardized preform was filled and results tabulated. The normal range considered was 0.47-4.6u.i.u/ml TSH was done using EMIA (Chemiluminescence microparticle Immunoassay) Abbot Architect analyzer. All patients had at least 1 year of subfertility. Those with known thyroid disease were excluded from the study.

**Results:** Out of 320 subfertile women 27(0.084%) women had raised TSH levels, and 11(0.034%) had low TSH levels.

**Conclusion:** TSH should be done at an early stage of subfertility workup as more than half of the detected patients had subclinical hypothyroidism and missing this problem leads to unnecessary medications, invasive investigations and psychological burden on the couple.

**Key Words:** TSH, Subfertility, Hypothyroidism.

## INTRODUCTION

Thyroid disease whether diagnosed or undiagnosed is a contributor to subfertility. In our society a large number of patients come from the underprivileged class, infertility or subfertility has important Medical, economical and psychological implications. Thyroid dysfunction can lead to anovulatory cycles, luteal phase defects, sex hormone imbalances<sup>1,2</sup>. A normal thyroid function ensures fertility, pregnancy maintenance, even in the earliest days after conception<sup>3</sup>. Thyroid evaluation should be done in women seeking subfertility workup. Hypothyroidism can be easily detected by assessing TSH levels in the blood<sup>4</sup>.

A slight increase in TSH levels with normal T3 and T4 levels indicates subclinical hypothyroidism, whereas high TSH levels with low T3 and T4 levels indicate clinical hypothyroidism<sup>5</sup>. Prevalence of hypothyroidism in reproductive age group is 2-4% and has been shown to be a cause of infertility and habitual abortion<sup>6</sup>. A detailed thyroid evaluation should include T3, T4, and TSH and autoimmune testing if needed.

Subclinical hypothyroidism is more common. It can cause anovulation directly or by causing elevation in prolactin levels. When patients show increased prolactin due to increased thyrotropin releasing hormone, hypothyroidism should be treated first to evaluate cause of increased prolactin<sup>7</sup>.

Thyroid dysfunction has to be seriously considered as a cause of subfertility and we conducted this study to see if TSH really needs to be assayed during subfertility workup, and how frequent was the derangement, and also to find the proportion of subclinical hypothyroidism among the total.

## MATERIAL AND METHODS

This descriptive study was conducted on a total of 320 patients undergoing subfertility workup over a period of 9 months from April 2013 to December 2013 in a specialist Gynae OPD, Khyber Teaching Hospital. TSH was done to exclude thyroid dysfunction. Further thyroid studies were done only on patients who showed derangement of TSH. A standardized proforma was filled with necessary details and results tabulated.

Normal range of TSH was =0.47-4.64Uiu/ml, hypothyroidism was considered at TSH levels more than 4.64Uiu/ml and hyperthyroidism at TSH levels below 0.47Uiu/ml. analysis was done by EMIA Chemiluminescence Microparticle Immunoassay (Abbot

---

### Address for Correspondence:

**Dr. Jamila M. Naib**

Associate Professor

Department of Obstetrics and Gynaecology,

Khyber Teaching Hospital, Peshawar - Pakistan

Cell: +92-300-5937571

Email: jamila\_naib@hotmail.com

architect analyser). All patients had at least one year of subfertility. Those with known thyroid disease were excluded from the study.

## RESULTS

Out of 320 women enrolled in the study 13(4.06%) had raised TSH levels and 5(1.5%) had decreased TSH levels. Hypothyroid subfertile women were further subdivided into subclinical (TSH 4-6Uiu/ml) and clinical (TSH >6Uiu/ml) hypothyroidism. It was found that 7(59.2%) had subclinical disease and 6(40.8%) of the total hypothyroid patients had clinical disease as shown

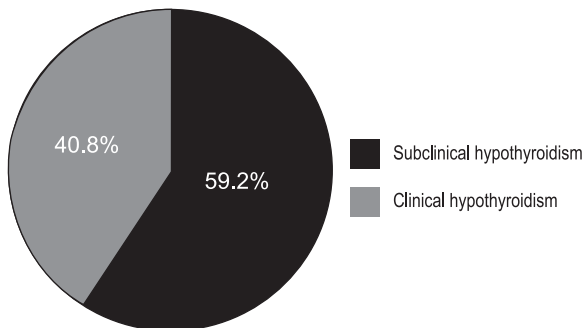


Figure 1: Pattern of Presentation of Infertile Women with Hypothyroidism

in Figure 1.

## DISCUSSION

Derangement of Thyroid function has a profound result on reproduction and pregnancy, and the spectrum of disorders ranges from abnormal sexual development to menstrual irregularities and infertility. TRH is increased due to hypothyroidism and this leads to stimulation of pituitary resulting in increased TSH and Prolactin<sup>8</sup>. Hyperprolactinemia impairs GnRH pulsatility and thereby ovarian function<sup>9</sup>. TSH is checked by most gynecologist regardless of menstrual rhythm.

In our study the prevalence of hypothyroidism was 59.2% of the total hypothyroids were subclinical, and 40.8% had clinical disease. Similar comparable results were reported by Indu Verma et al<sup>8</sup>.

A total of 4.06% patients had increased TSH, this result is comparable to results of Oliver AC et al<sup>11</sup>. Thyroid dysfunction is a common cause of infertility which can be treated by appropriate correction of levels of thyroid hormones<sup>12</sup>. The approach helps avoid unnecessary invasive procedures in the subfertile women, and use of expensive medications without the knowledge of thyroid status. It is recommended that in the presence of deranged TSH, thyroid function should be corrected first.

In established hypothyroidism, thyroxine normalizes the menstrual cycle and improves fertility rates. Normal TSH levels are a prerequisite for fertility<sup>13</sup>. The decision to initiate thyroid replacement therapy in subclinical hypothyroids at early stage is justified in infertile<sup>14</sup>. Studies have also suggested thyroid treatment according to TRH testing<sup>15</sup>. Recent data also indicates that variations in TSH levels in narrower range or borderline cases i.e 4-5, 5-6, or more than 6 should not be ignored in infertile women not showing clinical signs of hypothyroidism<sup>16</sup>. Subclinical hypothyroidism is more common and can cause an ovulation directly so should be dealt with aggressively<sup>17</sup>

## CONCLUSION

TSH derangement should be excluded in all patients seeking sub fertility workup in order to avoid invasive procedures unnecessarily in the presence of a treatable cause.

## Recommendations

For better management of infertility cause we should plan further studies with large sample size and long term follow up in which effect of treatment can also be seen.

## REFERENCES

1. Poppe K, Velkenier B, Glinoeer D. Thyroid disease and female reproduction. *Clin. Endocrinol.* 2007; 66: 309-21.
2. Canaris GJ, Manowitz NR, Mayor G, Ridgway EC. The Colorado thyroid disease prevalence study. *Arch intern Med* 2000; 86: 4585-90.
3. Trokondes KM, Skordis N, Picolos MK. Infertility and Thyroid disorders. *Curr Opin Obstet Gynecol.* 2006 Aug; 18(4): 446-51.
4. Goswami B, Patel S, Chatterjee M, Koner BC, Saxena A. Correlation of Prolactin and Thyroid hormone concentration with menstrual patterns in infertile women. *JReprod Infertil.* 2009; 10: 207-13.
5. Lincon SR, KeRW, Kuttch WH. Screening for hypothyroidism in infertile women. *The journal of Reproductive Medicine* 1999, 44(5): 455-57.
6. Krasses GE. Thyroid disease and female reproduction. *Fertil Steril.* 2000; 74: 1063-70.
7. Poppe K, Velkaniers B. Thyroid disorders in infertile women. *Ann Endocrinol.* 2003; 64: 45-50.
8. Indu Verma, Renuka Sood, and Satindar Kaur. Prevalance of Hypothyroidism in infertile women. *Int J Appl Basic Med Res.* 2012; 2(1): 17-19.
9. Dajan CM, Saravanan P, Bayly G. Whose normal thyroid function is better – yours or mine? *Lancet.* 2002; 360: 353-54.
10. Aghajanova L, Lindeberg M, Carlsson I B, et al. Receptors for thyroid stimulating hormones and

- thyroid hormones in human ovarian tissue. *Reprod Biomed online*. 2009; 18: 337-47.
11. Oliver AC, Chaffkin LM, Kates RJ, Atlan TR, Beller P, Graham NJ. Is it necessary to take serum levels of thyroid stimulating hormones and prolactin in asymptomatic women with infertility. *Com Med*. 2003; 67: 393-95.
  12. Monzani F, Del Guerra P, Caraceio N, Pruneti CA, Pucci E, Luisi M et al. Sub clinical hypothyroidism: neurobehavioural features and beneficial effects of L Thyroxine treatment. *Clin Invest* 1993; 71: 367-71.
  13. Rehman AH, Abbassey HA, Abbassey AA. Improved in vitro fertilization outcomes after treatment of subclinical hypothyroidism in infertile women. *Endocr Pract*. 2010; 16: 792-97.
  14. Michael T, Ms Deromott, Chester R. Subclinical Hypothyroidism is mild thyroid failure and should be treated. *J Clin Endocrinol Metab* 2001; 86: 4585-90.
  15. Raber W, Nowotony P, Vytiska- Binstorfer E, Vierhapper H. Thyroxine treatment modified in infertile women according to thyroxine releasing hormone testing: 5 year follow up of 283 women ref. after exclusion of absolute causes of infertility. *Human Reprod*. 2003; 18: 707-14.
  16. Anderson S, Pederson KM, Bruhn NH, Laurberg P. Narrow individual variations in serum T4 and T3 in normal subjects; a clue to the understanding of sub clinical thyroid disease. *J C lin Endocrinol Metab*. 2002; 87: 1068-72.

## **ONLINE SUBMISSION OF MANUSCRIPT**

It is mandatory to submit the manuscripts at the following website of JMS. It is quick, convenient, cheap, requirement of HEC and paperless.

Website: **[www.jmedsci.com](http://www.jmedsci.com)**

The intending writers are expected to first register themselves and then attach/submit the manuscript. If processing fee is not submitted before should be deposited with Managing Editor in cash or can submit in the form of bank draft in the name of editor JMS. Also follow the format and check list of the Journal. Author agreement can be easily downloaded from our website. A duly signed author agreement must accompany initial submission of the manuscript.

The Journal of Medical Sciences, Peshawar is indexed with WHO IMEMR (World Health Organisation Index Medicus for Eastern Mediterranean Region) and can be accessed at the following URL.

<http://www.who.int/EMRJorList/details.aspx?docn=4468>