Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/5cnb5z49

ROLE OF THYROID DYSFUNCTION IN INFERTILE WOMEN WITH MENSTRUAL DISTURBANCES

Rabia Syed[1], Neelam Abbas[2*], Amna Najam[3], Misbah Harim[4], Beenish Riaz[5]

[1]Women Medical Officer, Department of Obs and Gynae, Allama Iqbal Teaching Hospital, Dera Ghazi Khan, Pakistan
[2]FCPS Gynae & Obs, Senior Registrar, DHQ Hospital, Dera Ghazi Khan, Pakistan
[3]Assistant Professor, Deparrment of Gynae & Obs, Al-Nafees Medical College and Hospital, Islamabad, Pakistan
[4]Senior Registrar, LIMHS, Thatta, Pakistan
[5]Associate Professor, Deparrment of Obstetrics and Gynaecology, Bahria University College of Medicine, (BUCM), Karachi, Pakistan

***Corresponding Author:** Neelam Abbas
*Adhoc Senior Registrar, DHQ Hospital, Dera Ghazi Khan, Pakistan
Email: drneelam13@yahoo.com

ABSTRACT

Background: Infertility is one of the medial, social and psychological burdens in this part of world. Thyroid dysfunction can lead to menstrual disturbance, anovulatory cycles, and decreased fecundity. Proper management of thyroid dysfunction can result restoration of normal fertility. Therefore it is very important to screen thyroid abnormalities among women with infertility.

Objective: To assess the role of thyroid dysfunction in infertile women with menstrual disturbances

Methodology: This cross-sectional study was conducted at the Department of obstetrics and gynaecology Allama Iqbal Teaching Hospital Dera ghazi khan. The study duration was one year from March 2023 to March 2024. A total of 200 in- fertile women were enrolled. Their clinical detail along with menstrual history was recorded on a predesigned proforma. Estimation of serum levels of thyroid hormones (TSH, T3 and T4) were performed on Chemiluminescence Immuno- assay Analyzer CLIA-IIS. Statistical analysis was performed using the statistical package for social sciences (SPSS) version 24.

Results: Amongst 200 infertile women 130 (65%) were cases of primary infertility and 70 (35%) of secondary infertility. The mean age of primary infertile women was 28.12 (±5.99) years and secondary infertile women 29.11 (±2.24) years. Irregular menstrual cycles were found in 12 out of 40 hyperthyroid, 3 out of 5 hypothyroid and 27 out of 155 euthyroid infertile women. A significant association was observed on comparison of thyroid profile with irregularities in menstrual cycle (p=0.002).

Conclusion: Our study concludes that thyroid dysfunction plays a significant role in female infertility which may manifest as menstrual disturbances especially in primary infertile women. Thyroid profile can help us in prompt diagnosis and timely initiation of therapy. Therefore thyroid hormone profile must be included in the routine workup of infertile women in our setup.

Keywords: Thyroid dysfunction; Infertile women; Menstrual disturbances”

INTRODUCTION

"Infertility is defined as the inability to conceive after one year of regular intercourse without contraception. [1] The prevalence of infertility is estimated between 12 and 14 % and remains stable in recent years. It thus represents a common condition with important medical, economic and psychological implications. According to the standard protocol, infertility evaluation usually identifies different causes including male infertility (30%), female infertility (35%); the combination of both 20% and finally unexplained or idiopathic infertility 15%. Female causes of infertility comprise of endometriosis, tubal damage and ovulatory dysfunction. [2, 3] Thyroid dysfunction itself is a condition interfering with normal ovarian function. Thyroid hormones have profound effects on reproduction and pregnancy.

There is known association of hyperthyroidism and hypothyroidism with menstrual disturbances and decreased fecundity.[4]The most frequent thyroid syndromes like hypothyroidism and thyrotoxicosis are accompanied with menstrual disturbances. [5] Thyroid dysfunction which is quite prevalent in the population affects many organs including male and female gonads, interferes with human reproductive physiology, reduces the likelihood of pregnancy and adversely affects pregnancy outcome, thus becoming relevant in the algorithm of reproductive dysfunction. Although menstrual irregularities are common, ovulation and conception can still occur in hypothyroidism where thyroxine treatment restores normal menstrual pattern and reverses hormonal changes. Subclinical hypothyroidism may be associated with ovulatory dysfunction and adverse pregnancy outcome. Menstrual disturbances, frequent in thyrotoxicosis are restored following treatment. [6] Awareness of thyroid status in the infertile couple is crucial because of its significant, frequent and often reversible or preventable effect on infertility.

Many aspects of the role of thyroid disorders in infertility, however, need further research. [7] The prevalence of thyroid disorders in infertile women is variable globally. Hyperthyroidism ranges from 2.1% to 5.8% and hypothyroidism ranges from 2.3% to 6% in different studies in infertile women.[8-10] Therefore, in female infertility workup, the evaluation of thyroid hormone profile should be given its due importance. The objective of this study was to find the role of thyroid dysfunction in primary and secondary infertile women with menstrual disturbances."

MATERIAL AND METHODS

"This cross-sectional study was conducted at the Department of obstetrics and gynaecology Allama Iqbal Teaching Hospital Dera ghazi khan. The study duration was one year from March 2023 to March 2024. A total of 200 patients were enrolled in the current study. In this study all infertile women were included who attended the infertility clinic OPD for work up and their spouse had normal values on semen analysis. Those patients who had history of thyroid disease or thyroidectomy were excluded from the study. Their clinical details along with menstrual history was recorded on a predesigned proforma. Estimation of serum levels of thyroid hormones (TSH, T3 and T4) were performed on Chemiluminescence Immuno- assay Analyzer CLIA-IIS manufactured by Biomed Engineering, China using Chemiluminiscence Immu-noassay Kits manufactured by Autobio Diagnostics Co. Ltd manufactured by Zhengzhou, China and the manufacturer's instructions were followed.

The reference values for thyroid status were taken as TSH (0.35 to 5.3 µlU/mL), T4 (5.0 to 13.0 µg/dL), T3 (0.8 to 1.9 ng/mL) Values below/above were considered abnormal. The study was approved by Institutional Ethical Committee of Allama Iqbal Teaching Hospital Dera ghazi khan. Statistical analysis was performed using the statistical package for social sciences (SPSS) version 24. Statistical results were given as mean and standard deviation for continuous variables. Difference between the primary and secondary infertility were analyzed for statistical significance using Chi square test and $p<0.05$ was considered statistically significant."

RESULTS

In the current study a total of 200 patients were enrolled. Amongst 200 infertile women, 130 (65%) were cases of primary infertility and 70 (35%) were with secondary infertility. (Figure 1) The mean age of primary infertile women was 28.12 (±5.99) years and secondary infertile women 29.11 (±2.24) years. Based on the age wise distribution, the number of primary infertile womens in age group ≤20 years were 13 (10%), 91 (70%) in age group 21-30 years, 23 (17.69%) in age group 31-40 years and 3 (2.31%) were in age group 41-50 years while in case of secondary infertile women, 00 (00%) women were in age group ≤20 years, 14 (20%) age group 21-30 years, 29 (41.43%) in age group 31-40 years, 23 (32.86%) in age group 40-50 years and 4 (5.71%) were in age group 51-60 years. (Figure 2) Based on thyroid profile of infertile women, the Hypothyroid patients were 5 (2.5%), hyperthyroid were 40 (20%) and euthyroid were 155 (77.5%). (Figure 3) Irregular menstrual cycles were found in 12 out of 40 hyperthyroid, 3 out of 5 hypothyroid and 27 out of 155 euthyroid infertile women. A significant association was observed on comparison of thyroid profile with irregularities in menstrual cycle (p=0.002). (Table 1)

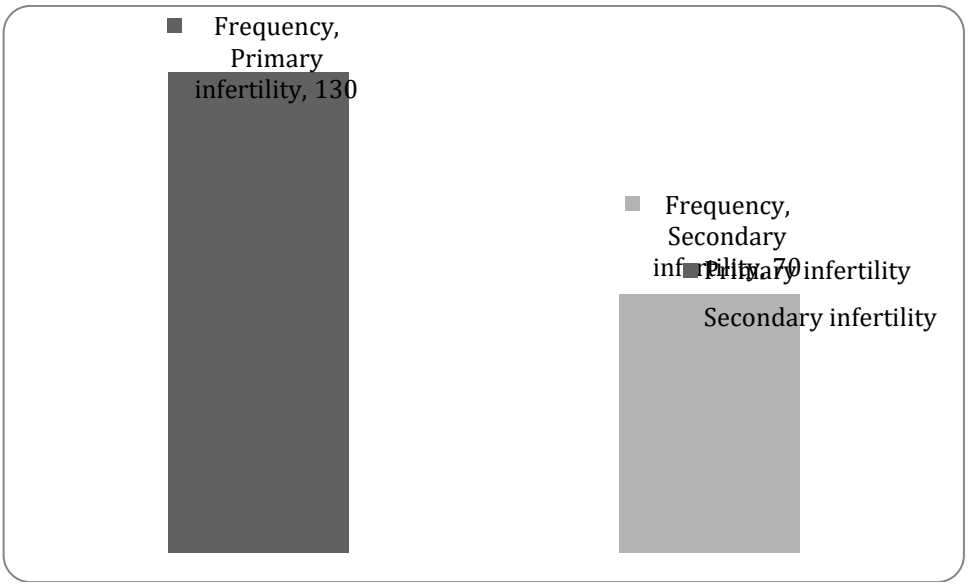

Figure 1: Distribution of patients based on type of infertility

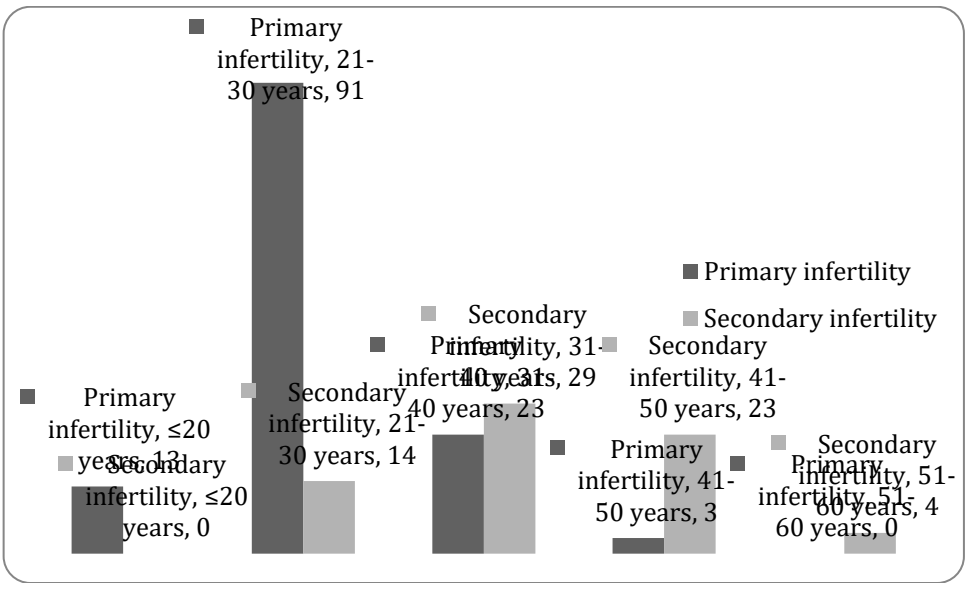

Figure 2: Age wise distribution of patients

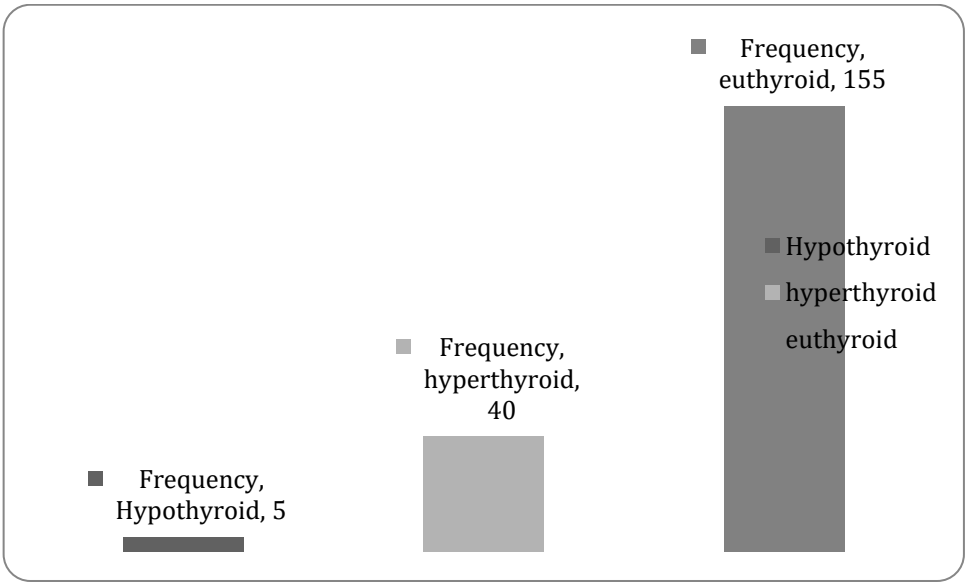

Figure 3: Frequency of hypothyroid, hyperthyroid and euthyroid patients

Table 1: Comparison of thyroid profile with menstrual irregularities

Infertile women	Hypothyroid Frequency (%)	Hyperthyroid Frequency (%)	Euthyroid Frequency (%)	P value
Irregular menstrual cycles	3 (60%)	12 (30)	27 (17.41%)	0.002
Regular menstrual cycles	2 (40%)	28 (70%)	128 (82.59%)	

DISCUSSION

"The prevalence of infertility is estimated between 12 and 14 % and remains stable in recent years. It thus represents a common condition with important medical, economic and psychological implications. According to the standard protocol, infertility evaluation usually identifies different causes including male infertility (30%), female infertility (35%); the combination of both 20% and finally unexplained or idiopathic infertility 15%. Female causes of infertility comprise of endometriosis, tubal damage and ovulatory dysfunction. [2, 3]

The study consisted of 200 infertile women of reproductive age group. It included 130 cases of primary infertility and 70 cases of secondary infertility. Their thyroid profile was evaluated in the light of menstrual history. The prevalence of primary infertility in this study population was 65% and secondary infertility 35% which is close to another study conducted at Peshawar i.e. 73.31% and 26.68% respectively.[11] The study conducted by Ghazi et al. shows 54.5% for primary infertility and 45.6% secondary infertility. [12]

Other studies conducted by Mosher [13] and Kasius et al [14] also have identical values. In contrast the study conducted by Girish & Manjunath [15] showed a higher incidence for primary infertility i.e. 80% and much lower for secondary infertility i.e., 17.8% as compared to this study.

In this study the prevalence of hyperthyroidism was 20%, which is almost similar to a study done at a local tertiary care hospital which was 16%. [16] Other studies report prevalence of hyperthyroidism as 26% by Biradar et al. [17] and 23% by Singh et al. [18]. Many studies have found prevalence of hyperthyroidism as 2.1%, [19] 2.2%, [20] 3.1% [21] and 4.2% [22] respectively. These percentages are much lower than my study which may reflect regional differences. Hyperthyroidism was observed to be more common in age group 21-30 years in our study. The Prevalence of hypothyroidism in our study was 2.5% but several studies showed prevalence of hypothyroidism in infertile women as 8%, [23] 7.6%, [24] 6.4% [25] and 8.7% [26] respectively which are higher than our study. While in a study carried out by Sharma et al [21] the prevalence of hypothyroidism was 35.4%.

In the present study menstrual irregularity was seen in 42 (21%). Corresponding values (18.94%) have been reported by Shanti & Priyadarshini [25] but there is conflict with this study conducted by Goswami [23] which showed 60% cases had menstrual irregularities. The reason claimed by the author was due to special referral pattern of patients to the hospital based on suspicion of thyroid disease. In our study we observed that menstrual irregularities due to both hypo and hyperthyroidism may play a significant role in infertility as compared to euthyroid status. Petta et al [26] and Rahman et al [27] have described hyperthyroidism in infertile women of reproductive age group as 3.2% and 3.3% respectively. In another study Sharma & Baliarsingh [28] showed that hyperthyroidism was significantly cor- related with menstrual disorders in infertile women. In our study 42 patients had menstrual irregularities out of which 12 had hyperthyroidism, 3 had hypo- thyroidism and 27 had normal thyroid profile."

CONCLUSION

Our study concludes that thyroid dysfunction plays a significant role in female infertility which may manifest as menstrual disturbances especially in primary infertile women. Thyroid profile can help us in prompt diagnosis and timely initiation of therapy. Therefore thyroid hormone profile must be included in the routine workup of infertile women in our setup.

REFERENCES

1. Guy S: In Infertility: What is infertility? Ehealth MD, September 2009.
2. Poppe K, Velkeniers B: Thyroid and infertility. Verh K Acad Geneeskd Belg, 2002; 64(4):389-99.
3. Poppe K, Glinoer D, Van S. A, Tournaye H, Devroey P, Schiettecatte J et al: Thyroid dysfunction and autoimmunity in infertile women. Thyroid, 2002:12(11):997-1001.
4. Poppe K, Velkeniers B: Thyroid disorders in infertile women. Ann Endocrinol (Paris), 2003; 64(1): 45- 50.
5. Maruna P: Gynecological aspects of thyroid disorders-A review. Ceska Gynekol, 2006; 71(4):332-338.
6. Trokoudes K M, Skordis N, Picolos M K: Infertility and thyroid disorders. Curr Opin Obstet Gynecol, 2006; 18(4):446-51.
7. Sharma U R, Parmar C: Thyroid profile in infertile women and menstrual dysfunction. Source Indian Medical Gazette, updated 2007, www.endocrineindia.com/thyroidne.
8. Poppe K, Glinoer D, Van Steirteghem A, Tour- naye H, Devroey P, Schiettecatte J, et al. Thyroid dysfunction and autoimmunity in infertile women. Thyroid 2002; 12: 997-1001.
9. Joshi JV, Bhandarkar SD, Chadha M, Balaih D, Shah R. Menstrual irregularities and lactation failure may precede thyroid dysfunction or goiter. J Postgrad Med 1993; 39: 137-41.
10. Lincoln SR, Ke RW, KuttehWH. Screening for hypothyroidism in infertile women. J Reprod Med 1999; 44: 455-7.
11. Rahim R, Majid SS. Aetiology factors of infertility. J Postgr Med Inst 2004; 18: 166-71.
12. Ghazi A, Saddique M, Siddiq N, Jabbar S, Ali T, Jaipal S. Subfertility: experience in a tertiary care hospital. Pak J Surg 2007; 23: 4-7.
13. Mosher W. Reproductive impairments in the United States. Demography 1998; 31: 915-30.
14. Kasius JC, Broekmans FJM, Sie-Go DMDS, Bour- gain C, Eijkemans MJC, Fauser BC, et al. The reliability of the histological diagnosis of endo- metritis in asymptomatic IVF cases: a multicenter observer study. Hum Reprod 2012; 27: 153-8.
15. Girish CJ, Manjunath ML. Morphological patterns of endometrium in infertile woman-a prospective study. Int J App Basic Med Res 2011; 2: 512-20.
16. Jamal T. Tubal factor in infertility. J Postgrad Med Inst 2011; 2004; 18: 255-60.
17. Biradar SM, Poornima RT, Sonagra AD, Jay- aprakash Murthy DS. Thyroid dysfunction in infertile women. Int J Pharm Bio Sci 2012; 2: 53-8.
18. Singh L, Agarwai CG, Chowdhary SR, Mehra P, Khare R. Thyroid profile in infertile women. J Obstet Gynecol India 1990; 40: 248-53.

19. Poppe K, Velkeniers B, Glinoer D. Thyroid disease and female reproduction. Clin Endocrinol (Oxf) 2007; 66: 309-21.
20. Sadia S, Waqar F, Akhtar T, Sultana S. Character- istics of infertile patients with ovulatory dysfunc- tion and their relation to body mass index. J Ayub Med Coll Abbottabad 2009; 21: 12-6.
21. Sharma B, Singh C, Kansal R. Significance of thyroid profile (serum T3, T4 & TSH) in infertile women. Indian J Community 2012; 24: 149-52.
22. Elahi S, Tasneem A, Nazir I, Nagra SA, Hyder SW. Thyroid dysfunction in infertile women. J Coll Physicians Surg Pak 2007; 17: 191-4.
23. Goswami B, Patel S, Chatterjee M, Koner BC, Saxena A. Correlation of prolactin and thyroid hormone concentration with menstrual patterns in infertile women. J Reprod Infertil 2009; 10: 207-12.
24. Rijal B, Shrestha R, Jha B. Association of thyroid dysfunction among infertile women visiting infer- tility center of Om Hospital, Kathmandu, Nepal. Nepal Med Coll J 2011; 13: 247-9.
25. Shanti MS, Priyadarshini AB. Hypoyhyroidism in gynaecology. J Obs Gyn India 1982; 32: 54-7.
26. Petta A, Arrunda MS, Zantut-Wittanann DE, Ben- etti-Pinto CL. Thyroid autoimmunity and thyroid dysfunction in women with endometriosis. Human Reproduction 2007; 22: 2693-7.
27. Rehman D, Fatima P, Banu J. Thyroid disorders in female subfertility. J Chittagong Med Coll Teach Assoc 2008; 19: 46-50.
28. Sharma N, Baliarsingh S. Prevalence of serum thyroid hormones and menstrual irregularities with infertility in Uttar Pradesh, India. Int J Pharm Res Sci 3: 3354-7