

Correlation of menstrual pattern with thyroid hormone level in infertile women

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Abstract

Introduction: Thyroid hormones have profound effects on reproduction and pregnancy. There seems to be an association of thyroid dysfunction with menstrual disturbances and decrease fecundity.

Aim: This study was undertaken to review the impact of thyroid status on menstrual function and fertility of subjects.

Method: 80 women with primary infertility attending gynae OPD in 6 month period were evaluated. 80 fertile women with similar age and socioeconomic status were taken as controls. The association of thyroid dysfunction and serum prolactin with their menstrual status was reviewed.

Results: Menstrual disorders were observed in 42% of infertile women. Serum T3 and T4 level were significantly decreased in infertile females as compared to fertile females. Increase in serum TSH level in infertile females was also significant.

Conclusion: In our study, there was high prevalence of thyroid disorder and in infertile women which may have lead to their menstrual irregularities resulting in infertility.

Keywords: Infertility, Menstrual disorder, Thyroid Dysfunction, Hypothyroidism

Introduction

Fertility in female is maintained by prevailing hormonal milieu, which is delicately balanced by hypothalamo-pituitary-thyroid-adrenogonadal axis. Thyroid dysfunction interferes with normal ovarian function causing menstrual disturbances. Hypothyroidism can affect fertility due to anovulatory cycles, luteal phase defects and sex hormone imbalance.

Materials and Methods

This was a prospective, cross-sectional study conducted in the Gynaecology outdoor of S.M.S. Medical College, Jaipur from January 2014 to August 2014. 80 women with primary infertility attending gynae OPD were evaluated. 80 fertile women with similar age and socioeconomic status were taken as controls. Informed consent was received. Related history and physical examination data were recorded in a pre-designed data collection sheet. Thyroid and Thyroid Stimulating Hormone (TSH) were

evaluated. Patients on treatment for thyroid disorders or hyperprolactinemia were excluded from the study. The association of thyroid dysfunction with their menstrual status was reviewed.

Results

Comparison of clinical findings and hormonal abnormality showed a higher prevalence of infertility with irregular menstruation. Overall, menstrual disorders were seen in 32.5% women of which 65% were infertile. Of the 80 infertile women, 42.5% had menstrual disorder while only 22.5% of fertile women had menstrual disorder. Among those with menstrual disorders, 41% infertile women had infrequent cycles.

Overall, 31.8% women had abnormal TSH levels. Among infertile women, 52.5% of pts were euthyroid 30% hypothyroid and 17.5% hyperthyroid as compared to fertile women in whom 84% were euthyroid. 15% were hypothyroid and only 1% were hyperthyroid.

22.5% had low TSH, two-thirds of whom were infertile. 30% of infertile women had low TSH as compared to only 15% fertile females, this difference was statistically significant.

9% had raised TSH levels of whom 93% were infertile. Increase in serum TSH level in infertile females was also significant.

There was significant correlation between serum TSH and menstrual cycles. Abnormal cycles were seen in only 25.6% euthyroid women but 44.4% in women with hypothyroidism and 53.3% in hyperthyroid women.

Discussion

Besides lowering metabolism, hypothyroidism also affects sensitivity to other hormones in body. Hypothyroidism leads to infertility by suppressing ovulation, causing luteal phase defects and sex hormone imbalance. Hypothyroidism is associated with increased thyrotropin

releasing hormone production which stimulates the pituitary into overproducing TSH and prolactin. Treating hypothyroidism mostly reverses infertility.

Similar to our study, Poppe and Velkeniers (2003), Sharma et al. (2012) and Turankar et al. (2013) also found the TSH levels in the infertile group to be high as compared to those in the control group and these were highly significant ($p < 0.0001$)

The prevalence of hypothyroidism in the study of Hivre et al in 2013 was about 20 % which was found to be 8% by Goswami et al (2009). In the study by Hivre et al, there was high prevalence of hypothyroidism in infertile female and also associated with hyperprolactinemia. They suggested serum TSH and prolactin levels as mandatory in the work up of all infertile women, especially those presenting with menstrual irregularities.

Sudek in his study in 2011 measured TSH level in patients and control groups and found it was significantly higher in infertile patients (8.319 ± 2.440) than control group (1.366 ± 0.474). Sharma et al, 2012 also reported that 16 % had menstrual irregularities with low TSH in their study.

Conclusion

In our study, there was high prevalence of thyroid disorder in infertile women which may lead to menstrual irregularity resulting in infertility. Therefore serum T3, T4, TSH and prolactin level should be evaluated in all infertile women, women, especially those presenting with menstrual irregularities.

References

- Goswami B, Patel S, Chatterjee M, Koner B C, Saxena A. 2009. Correlation of prolactin and thyroid hormone concentration with menstrual patterns in infertile women. *J Reprod Infertil.* 10(3): 207-212.
- Hivre MD, Dhananjay VB, Mahat RK. 2013. Bujurge International Study of Serum TSH and Prolactin Levels in Patients of

Female Infertility. Journal of Recent Trends in Science and Technology. 9: 1.
 Poppe K, Velkeniers B. 2003. Thyroid disorders in infertile women. Ann Endocrinol (Paris). 64:45-50.
 Sharma N, Singh SB. 2012. Prevalence of Serum Thyroid Hormones and Menstrual Irregularities With Infertility In Uttar Pradesh, India. IJPSR. 3(9): 3454-3457.
 Sudek HL. 2011. The Effect of Thyroxine Treatment in Infertile Subclinical

Hypothyroid Patients. Fac Med Baghdad. 53: 3.
 Turankar S, Sonone K, Turankar A. 2013. Hyperprolactinaemia and its Comparison With Hypothyroidism In Primary Infertile Women. Journal of Clinical and Diagnostic Research. 5: 794-796.

Table 1 Menstrual dysfunction and fertility

	Normal menses	Abnormal menses		
	n=108	Frequent n=14	Infrequent n=22	Irregular n=16
Fertile female	62	6	08	04
Infertile female	46	8	14	12

Table 2 TSH, Prolactin Level and Fertility

	Normal TSH	Hypo thyroidism	Hyper thyroidism	Normal prolactin	Hyper prolactinemia
Fertile female	67	12	01	74	06
Infertile female	42	24	14	58	22

Table 3 Correlation of TSH Levels with Menstrual Dysfunction in Infertile female

Menstrual cycle		Hypothyroidism n=36	Thyroid n=109	Hyperthyroidism n=15
Normal	Fertile	11	50	1
	Infertile	9	31	6
Abnormal	Fertile	1	17	0
	Infertile	15	11	8