



A STUDY OF SERUM PROLACTIN IN HYPOTHYROID FEMALES AND ITS CORRELATION WITH THYROID STIMULATING HORMONE

Physiology

Dr Soumitra Nath

Assistant Professor, Department of Physiology Assam Medical College and Hospital, Dibrugarh, Assam

ABSTRACT

This study was conducted on fifty newly diagnosed hypothyroid female subjects in the age group of (18-45) years at F.A.A. Medical college and Hospital, Barpeta, Assam. The subjects had no medical reasons for hyperprolactinemia and Thyroxine treatment was not started during collection of sample. 10 cc of fasting blood sample was collected from each subject and serum levels of TSH, T₃, T₄ and Prolactin measured by CLIA method. The mean TSH was 9.95 ± 2.66 μ U/ml and the mean Prolactin level was 26.36 ± 8.91 ng/mL. 17 out of 50 cases i.e., 34% had hyperprolactinemia. Pearson correlation coefficient between serum TSH and prolactin came out to be 0.727. The P value was < 0.0001. Thus, the correlation between hyperprolactinemia and TSH was found to be highly significant in this study. Hyperprolactinemia can lead to female infertility. Hence, in hypothyroid females of reproductive age group, serum prolactin also should be estimated.

KEYWORDS

Prolactin, TSH, hypothyroid

INTRODUCTION

Hyperprolactinemia is considered as one of the many causes which may lead to female infertility. Some studies have shown that hypothyroidism in females may lead to hyperprolactinemia. In hypothyroidism, stimulation of Thyrotropin-releasing hormone (TRH) causes increased TSH secretion. It has been postulated that in addition to stimulating TSH, Thyrotropin-releasing hormone also stimulates the secretion of prolactin. Thus, hypothyroid state may indirectly cause hyperprolactinemia. Through this study an attempt has been made to estimate the serum prolactin level in newly diagnosed hypothyroid females who had no clear medical causes of hyperprolactinemia and had not started Thyroxine replacement therapy. Also an attempt has been made to find the correlation between TSH level and serum prolactin.

AIMS AND OBJECTIVES OF THE STUDY

Aim of the current study was to estimate the serum prolactin level in newly diagnosed hypothyroid females in the age-group of (18-45) years and to determine the correlation between TSH and serum prolactin level.

MATERIALS AND METHODS

Study design: Cross sectional study with adequate statistical analysis. The present study comprised of 50 female subjects in the age group (18-45) years who were recently diagnosed as hypothyroid and were not under treatment with Thyroxine.

Subjects were selected from Medicine and Obstetrics & Gynaecology out patient departments of Fakhruddin Ali Ahmed Medical College and Hospital, Barpeta.

The inclusion criteria: females in the reproductive age group of (18-45) who have been recently diagnosed as hypothyroid were chosen as cases. The subjects had not started taking Thyroxine medications during the time of study.

Exclusion Criteria: The patients excluded from the study were the ones who presented with one of the following criteria:

- Those with clear medical reasons for hyperprolactinemia, such as lactating and pregnant women, subjects were liver or kidney disease, tumour of Pituitary gland and the ones taking antidepressants, estrogens or antipsychotics.
- All clinical or pharmacological causes of Prolactin elevation were ruled out.

METHOD OF STUDY:

10 cc of fasting blood sample was taken from each subject and then serum levels of TSH, T₃, T₄ and Prolactin were measured by chemiluminescent immuno assay (CLIA) method in the Biochemistry laboratory of our Hospital.

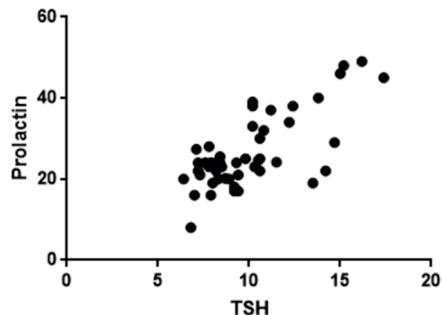
The normal range for T₃ was taken as 60-200 ng/dl, for T₄, it was 4.5-12 μ g/dl, for TSH levels ranging between 0.25-5 μ U/ml was considered normal. The range of serum Prolactin in females was taken as (1.9-25)

ng/mL. Hyperprolactinemia is defined as serum Prolactin >25 ng/mL. Statistical analysis was done using graphpad Prism 7.

RESULTS AND OBSERVATION

Mean age of the study group was 29.4 ± 7.64 years. The mean TSH was 9.95 ± 2.66 μ U/ml and the mean Prolactin level was 26.36 ± 8.91 ng/mL. 17 out of 50 cases i.e., 34% had hyperprolactinemia. Pearson correlation coefficient between serum TSH and prolactin came out to be 0.727. The P value calculated was < 0.0001. Thus, the correlation between hyperprolactinemia and TSH was found to be highly significant in this study.

XY Data: Correlation of Data



Variables	Mean \pm SD
Age	29.4 ± 7.64 years.
Serum TSH	9.95 ± 2.66 μ U/ml
Serum Prolactin	26.36 ± 8.91 ng/mL

DISCUSSION AND CONCLUSION

Hyperprolactinemia is a condition of elevated prolactin levels in blood which can be physiological, pathological, or idiopathic in origin. It has been postulated that hypothyroidism may lead to hyperprolactinemia. In hypothyroidism, there is rise of TSH due to stimulation of Thyrotropin-releasing hormone (TRH) secreted by hypothalamus. TRH stimulates the secretion of prolactin in addition to TSH^[1]. TRH, increases the expression of the prolactin gene which stimulates the synthesis and secretion of prolactin. Some studies done abroad have revealed that hypothyroid state increases serum prolactin level^[2,3,4,5]. Even some studies done in India have revealed similar finding^[6,7,8].

In the present study, it was found that there is a rise in serum prolactin level in 34% cases. The correlation between serum TSH and serum prolactin level was found to be strong. But the rise of prolactin level is marginal and not comparable to the physiological rise seen during lactation. Whether this rise may lead to any problem in fertility or not, needs to be evaluated by correlating with the complaints of the subjects. Moreover, hypothyroid state in itself also may lead to

different problems related to menstrual cycle and conception. However, it can be concluded that one needs to be alert to check the prolactin level in hypothyroid state specially in females of reproductive age group.

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REFERENCES

1. Barrett Kim, Barman Susan, Boitano Scott. 2012. Review of Medical Physiology ,24 th ed; 334. Mc Graw Hill
2. Honbo KS, van Herle AJ, Kellett KA. Serum prolactin levels in untreated primary hypothyroidism. *Am J Med.* 1978;64:782-87.
3. Olive KE, Hennessey JV. Marked hyperprolactinemia in subclinical hypothyroidism. *Arch Intern Med.* 1988;148:2278-79
4. Bahar A, Akha O, Kashi Z, Vesgari Z. Hyperprolactinemia in association with subclinical hypothyroidism. *Caspian J Intern Med.* 2011;2(2):229-33.
5. Raber W, Gessl A, Nowotny P, Vierhapper H. Hyperprolactinaemia in hypothyroidism: clinical significance and impact of TSH normalization. *Clin Endocrinol.* 2003;58(2):185-91
6. Binita Goswami, et al. Correlation of Prolactin and Thyroid Hormone Concentration with Menstrual Patterns in Infertile Women. *J Reprod Infertil.* 2009;10(3):207-12.
7. Goel P, Kahkasha NS, Gupta BK, Goel K. Evaluation of serum prolactin level in patients of subclinical and overt hypothyroidism. *J Clin Diagn Res.* 2015;9:BC15-7.
8. Turankar S, Sonone K, Turankar A. Hyperprolactinemia and its comparison with hypothyroidism in primary infertile women. *Journal of Clinical and Diagnostic Research.* 2013;7(5):794-96.