

## Outcome of Treating Primary Hypothyroidism in Correction of Mildly Elevated Serum Prolactin Level in Menstrual Disorders

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### Abstract

**Introduction:** Association of hyperprolactinemia with primary hypothyroidism is well known in the literature however, marked elevation of serum prolactin in subclinical hypothyroidism (SCH) has not been commonly reported. Elevated levels of serum thyroid stimulating hormone (TSH) and serum prolactin are seen in different menstrual irregularities.

**Method:** In our study, we have assessed serum prolactin and serum TSH levels in females suffering from menstrual disorders and implication of treatment of primary hypothyroidism on serum prolactin level.

**Result:** Our study shows that the treatment of primary hypothyroidism with thyroxine sodium corrects mildly increased serum prolactin level concomitantly.

**Conclusion:** The treatment of primary hypothyroidism with thyroxine sodium brings serum prolactin level down and toxic effects of treating hyperprolactinemia separately may be avoided.

**Keywords:** Primary Hypothyroidism, Hyperprolactinemia, TSH, Thyroxine Sodium.

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### Introduction

Hyperprolactinemia is common in primary hypothyroidism, but to our knowledge, marked elevation of serum prolactin in subclinical hypothyroidism (SCH) has not been commonly reported [1]. In patients with hypothyroidism, an increase in prolactin level is due to compensatory increase in the discharge of central hypothalamic TRH as a result of low thyroxine [2]. In few hypothyroid patients, who have elevated

serum prolactin levels, the values become normal when the hypothyroidism is corrected [3].

Prolactin and thyroid stimulating hormone levels are tested in most patients with amenorrhoea as prolactin secreting adenomas and thyroid disease are relatively common and require specific treatment. Because of this relationship between hypothyroidism and prolactin levels both hormones are

measured simultaneously. If both are increased, treatment for hypothyroidism will also normalize prolactin level [4].

If TSH level is elevated, free thyroxine (FT<sub>4</sub>) level is found low to confirm clinical hypothyroidism. Primary hypothyroidism may result in mildly elevated prolactin level. In this disorder, the decrease in circulating hormone levels results in a compensatory increase in hypothalamic thyrotropin releasing hormone (TRH) secretion. TRH prompts pituitary gland thyrotropes to produce TSH. In addition TRH also binds to pituitary lactotropes, increasing prolactin secretion. This tight link between thyroid function and prolactin levels justifies measurement of TSH with prolactin levels when initiating evaluation for galactorrhoea or amenorrhoea. These potentially discorded effect are reflected in the various bleeding patterns seen with thyroid disease [5].

Thyroid hormone increases sex hormone binding globulin levels altering the levels of unbound and thereby active ovarian steroids. Hypothyroidism is stated to cause anovulation and subsequent heavy menstrual bleeding. Hyperthyroidism is implicated in amenorrhoea. As might be expected the

likelihood of menstrual abnormality correlates with the severity of the thyroid function disturbance [6].

### Aims and Objectives

Aims and objectives are to assess the rise in serum thyroid stimulating hormone (TSH) and serum prolactin are interrelated. The treatment of hypothyroidism also reduces the serum prolactin level, therefore reducing the unnecessary drug overload and its side effects to the patient for the treatment of hyperprolactinemia separately.

### Materials and Methods

A prospective study was done from 1<sup>st</sup> December 2020 to 31<sup>st</sup> July 2022 in Narayan Medical College and Hospital, Jamuhar, Sasaram. Total number of patients selected for the present study was 273 between the age group of 21 to 40 years, out of which 181 patients were in the age group of 21 to 30 years and 92 patients belonged to the age group of 31 to 40 years. All the patients had menstrual irregularities and they were investigated for serum TSH and serum prolactin level. The normal range of serum TSH is 0.34 to 5.5  $\mu$  IU/ml and serum prolactin is 2 to 19 ng/ml.

### Observation

**Table1: Showing number of patients having raised levels of both serum TSH and prolactin levels:**

Age group of Patients	Raised TSH & Prolactin levels (Prolactin < 100 ng/ml)	Raised Prolactin levels only	Raised TSH levels only	Normal TSH & Prolactin levels	Total in different age groups	Total No. of Patients
21 to 30 yrs (No.)	102	31	26	22	181	273
31 to 40 yrs (No.)	25	07	29	31	92	

**Table 2: Showing spectrum of response to treatment:**

No. of patients showing complete response	No. of patients showing partial response	No. of patients showing no response	Total No. of patients
89	27	11	127

### Discussion

In our study 127 out of 273 patients have raised levels of both serum TSH and serum prolactin. All the patients in this group were treated with thyroxine sodium and were re-investigated after eight weeks. Out of 127 patients 89 are showing complete response (serum TSH and serum prolactin levels normalized) whereas 27 patients show partial response and 11 patients have no response. The results of our study are similar to the findings of Serio et al [2], Mar [3], Krassas GE *et al* [5] and Kakuno Y *et al* [6].

### Summary

The patients with mildly increased serum prolactin level (Below 100 ng/ml) with increased serum TSH level responded to thyroxine sodium with decrease in serum prolactin level and these patients were spared from side effects and expenses of other treatment modalities.

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