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Original Research Article

Hyperprolactinemia and Hypothyroidism in Population of East Medinipur, West Bengal: A Hospital Based Study

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ABSTRACT

Introduction: Hyperprolactinemia is one of the most rampant endocrine disorders in hypothalamic-pituitary axis. Hypothyroidism refers to state that results in a deficiency of thyroid hormones, including hypothalamic or pituitary disease and generalized tissue resistant to thyroid hormone. Thyroid releasing hormone can causes rise in serum prolactin levels in patients of primary hypothyroidism.
Methods: A total of 170 patients presenting to endocrinology clinic for various thyroid related problems were selected. Serum T3, T4, TSH and Prolactin were analyzed by using Benesphera enzyme linked immunosorbent assay kit from Avantor, on Lablife ER2007 elisa reader from Diagnova India.
Results: Prolactin level is high in the subclinical hypothyroid patients and hypothyroid patients as compared to euthyroid patients.
Conclusion: Hyperprolactinemia was an important feature in patients with newly diagnosed hypothyroid and subclinical hypothyroid patients.

Key words: Hyperprolactinemia, Hypothyroidism, Prolactin, TSH.

INTRODUCTION

Hyperprolactinemia is one of the most rampant endocrine disorders in hypothalamic- pituitary axis. [1] In 1988 for the first time, an increase in the level of serum prolactin was reported in a patient with carpal tunnel syndrome and subclinical hypothyroidism. [2]

Pathologic hyperprolactinemia is predominantly applied for the situation in which serum prolactin level increases because of some reasons other than physiologic causes. Prolactin secretion is controlled by prolactin inhibitor factor that is secreted from hypothalamus, other factor like Thyroid releasing hormone (TRH) cause to increase prolactin secretion. [1] In fact, TRH in addition to increasing TSH, also raise the serum prolactin level. [3] In patients with primary hypothyroidism, increased level of TRH can causes rise in serum prolactin levels and these patients may have galactorrhea. [4] Different increased level of prolactin has been reported in approximately 30% of patients with primary hypothyroidism. [5] Subclinical hypothyroidism is defined by increase in serum TSH and normal thyroid hormones

levels i.e. Tri-iodothyronine (T3) and Tetra-iodothyronine (T4). [6] Hypothyroidism refers to state that results in a deficiency of thyroid hormones, including hypothalamic or pituitary disease and generalized tissue resistant to thyroid hormone, and disorders that affects the thyroid gland directly. [7] Biochemically decreases in T3 & T4 concentrations lead to hyper secretion of pituitary TSH and an increase in the level of serum TSH. This is a key laboratory finding especially in the early detection of thyroid gland failure. [8]

The signs and symptoms of hypothyroidism are comprehensive and may be confused with those of other clinical conditions, especially in postpartum woman and the elderly. Patients with severe hypothyroidism generally present with a group of signs and symptoms that may include lethargy, weight gain, hair loss, dry skin, forgetfulness, constipation and depression. Not all of these signs and symptoms are seen in every patient, and many may be blunted in patients with mild hypothyroidism. [9]

Clinically hypothyroidism may present with variety of symptoms and signs involving major systems of the body like endocrine, cardiovascular, central nervous, musculo-skeletal, hematological, reproductive, gastrointestinal and dermatological. [10]

So a study was planned to evaluate the impact of hypothyroidism on serum prolactin levels.

MATERIALS AND METHODS

The present study was undertaken in the Department of Biochemistry and Medicine of ICARE institute of medical sciences and research, East Medinipur, West Bengal, after obtaining the informed consent each patient was subjected to detailed history and clinical examination. A total of 170 patients (Males & Females) presenting to endocrinology clinic for various thyroid related problems were approached for participation in the present study.

Inclusion Criteria

Newly diagnosed cases of hypothyroidism were included in the study. The relevant clinical history was taken from all the patients and details were recorded in pre design format. All patients provided written informed consent for participation in the study: approved by ethical committee of the institute.

Exclusion Criteria

Patients who presented with one of the following criteria were excluded from the study: Those with clear Medical reasons for hyperprolactinemia, such as lactating and pregnant women, liver and kidney disease patients and also who were taking antidepressants, estrogens or antipsychotics.

Patient was assessed for hypothyroidism and its impact on levels of serum prolactin. Serum T3, T4, TSH and Prolactin were analyzed by using Benesphera enzyme linked immunosorbent assay kit from Avantor, on Lablife ER2007 elisa reader from Diagnova India.

Statistical method: The data was analyzed using SPSS-16 software package. Values were given in Mean ±SD.

RESULTS

Thyroid hormone profile of study subjects is shown in Table 1. TSH level is high in females as compared to males subjects.

Table 1: Comparison of T3, T4 & TSH Level (Mean ± SD) in Males & Females of study subjects

Sex	HORMONAL LEVEL		
	T3(nmol/L)	T4(nmol/L)	TSH(mIU/L)
Male	1.94±0.7	84.99±19.7	2.93±2.5
Female	1.83±0.9	89.8 ±37.9	3.68±1.9

In the study subjects prolactin level is high in the subclinical hypothyroid patients and hypothyroid patients as compared to euthyroid patients as shown in table 2.

Table 2: Hormonal status of male and female subjects in the study groups (values are expressed in mean ± SD)

Parameters	Euthyroid	Subclinical	Hypothyroid
T3	1.93±0.23	0.78±0.33	2.93±0.53
T4	98.1 ±19.9	68.7±23.4	77.4±21.3
TSH	3.3±1.2	27.8±9.16	14.3±7.13
PRL	37.1±18.9	73.6±22.9`	48.3±17.69

The mean of age, TSH and prolactin for subjects are shown in table 3, which shows that both the level of TSH and level of prolactin are high in the patients.

Table 3: Range and Mean± SD of age, TSH and Prolactin of study subjects

Parameters	Range	Patients
Age(Years)	20-25	32.15±6.16
TSH(mIU/L)	3.2-15	7.31±2.7
Prolactin	3-45 ng/ml	36.95±3.85

DISCUSSION

In present study, the effect of prolactin level was evaluated in males and females patients. Measuring TSH level in patients demonstrate that it is significantly higher in patients (7.31±2.7). This also goes with a study conducted by Lunenfeld et al [11] in Belgium, which showed that the mean serum TSH levels were significantly higher in women.

Kumkum A, et al, [12] stated that amenorrhea occurs in hypothyroidism due to hyperprolactinemia, which results from a defect in the positive feedback of estrogen on LH, and also because of the suppression of LH and FSH. It also mentioned that the prevalence of ovulatory dysfunction was one the common causes of female infertility. These findings were similar with the study of Raber et al [13] that menstrual disorders were seen in 26% of the hyperprolactinemia patients.

Thyroid hormones have profound effects on reproduction and pregnancy. In this study, the majority of patients had serum TSH & serum PRL level higher than the normal reference range. This in is not in accordance with study of Binita Goswamy et al. [14] A higher occurrence of hyperprolactinemia (59.37%) was seen in patients. This higher propensity of hyperprolactinemia is in agreement with the findings of Kumkum A et al [12] who had depicted a prevalence of 46% in their study.

Mild hypothyroidism may contribute to disturbing reproductive function. In a study in Vienna, abortions appeared to be associated with higher TSH, but not with elevated thyroid antibodies. [15] TSH was measured to classify cases with sub-clinical thyroid disorders. In our study, we did not evaluate thyroid antibodies like anti TPO.

Our study is in accordance with the study conducted by Staubu JJ et al, [6] who concluded in their study that there is increased prolactin secretion in patients of subclinical Hypothyroidism and hypothyroidism on males and females. That showed the higher prevalence of hyperprolactinemia in both hypothyroidism and subclinical hypothyroidism in female than male. A previous study suggested that perhaps estrogen caused to increase prolactin response to TRH that caused higher prolactin level in woman than men. [16]

CONCLUSION

Hyperprolactinaemia was an important feature in patients with newly diagnosed hypothyroid and subclinical hypothyroid patients, since, the level of serum prolactin rises in relation to rising level of TSH in patients. Further study is required to find out a positive correlation between hormone TSH and prolactin in the study subjects.

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