

Prevalence of hyperprolactinemia in hypothyroid patients

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Abstract

Background: Hyperprolactinemia is one of the most common endocrine disorder of hypothalamic pituitary axis. Hyperprolactinemia is caused by hypothalamic and non hypothalamic pituitary disorders. The latter includes many causes, one among which is hypothyroidism. The aim of the study was to evaluate prevalence of hyperprolactinemia in overt and subclinical hypothyroidism. **Materials and methods:** A cross sectional study was conducted including a total of 150 asymptomatic patients aged between 18-45 years of both sexes attending general medicine and gynaecology OPD of tertiary rural health care centre at Vikarabad were included. Thyroid profile was performed on all and corresponding serum prolactin was assessed in those with altered thyroid values and the results were analysed. **Results:** Out of 150 participants, 31 patients were diagnosed with hypothyroidism (both overt and subclinical) with higher incidence in females than males. Hyperprolactinemia was observed to be more common in overt than subclinical hypothyroidism. **Conclusion:** Routine prolactin screening is to be advised in all patients diagnosed with overt and subclinical hypothyroidism. **Key Words:** Hyperprolactinemia, Hypothyroidism, Subclinical Hypothyroidism, Overt hypothyroidism.

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INTRODUCTION

Prolactin is a hormone which is secreted by the pituitary gland, as the name implies it promotes lactation. It plays an important role in the reproductive system, and is also responsible for influencing behaviour and regulating the immune system. An increased level of prolactin in the blood circulation refers to Hyperprolactinemia. Prolactin levels are normally high in pregnancy and lactation. An increase in prolactin levels in non-pregnant women impairs the normal production of other hormones such as estrogen and progesterone, thus interfering with ovulation. In men, high prolactin levels may lead to galactorrhoea,

impotence, decreased libido and infertility. Hyperprolactinemia is one of the most prevalent endocrine disorder in hypothalamic-pituitary axis that can result from a number of causes. The common causes of hyperprolactinemia include pituitary tumours, hypothyroidism, stress and drug induced. It is relatively more common in females than males. Prolactin secretion is controlled by Prolactin Inhibitor Factor that is secreted from hypothalamus, other factors like vasoactive inhibitory peptide (VIP) and Thyroid releasing hormone (TRH) lead to increase in prolactin secretion¹ Thyrotropin-releasing hormone (TRH), simplest of the hypothalamic neurohormones, stimulates the synthesis and secretion of Thyrotropin (Thyroid-Stimulating Hormone) by the anterior pituitary gland. Increased levels of TRH stimulates the secretion of prolactin from the pituitary gland.² In patients with primary hypothyroidism, increased levels of TRH can cause rise in prolactin levels and these patients may have galactorrhea.³ Different increased level of serum prolactin has been reported in 30% of patients with primary hypothyroidism.⁴ Some studies have also reported that hyperprolactinemia is rare disorder in subclinical hypothyroidism which is reflected by high TSH

and normal thyroid hormones.⁵ In 1988 for the first time, an increase of serum prolactin was reported in a woman with carpal tunnel syndrome and subclinical hypothyroidism.⁶ Hyperprolactinemia may develop in patients with primary hypothyroidism through a variety of mechanisms. In response to the hypothyroid state, a compensatory increase in the discharge of central hypothalamic thyrotropin-releasing hormone occurs, which results in stimulation of prolactin (PRL) secretion. The role of TRH as a hypothalamic hypophysiotrophic hormone releasing TSH from the anterior pituitary gland is well-known but its role in the stimulation of PRL release from the anterior pituitary is still controversial.⁷⁻⁹ While the prevalence of hyperprolactinemia in overt hypothyroidism has been reported to be as high as 40%, its prevalence and clinical significance in subclinical hypothyroidism has only been reported in case reports and few studies.¹⁰⁻¹¹

AIM

To determine prevalence of hyperprolactinemia in Hypothyroid.

MATERIALS AND METHODS

The study was a cross sectional study conducted by the Department Of Biochemistry, MIMS. A total of 150 patients aged 18-45 years attending to tertiary rural health care centre of in Vikarabad during January 2019 to January 2020 were enrolled.

Inclusion criteria

Patients of both sexes between 18-45 year age, willing to participate in the study.

Exclusion criteria

Age less than 18 or more than 45 yrs. Patients with family history of thyroid disorders, pregnant and lactating females, Patients with steroids, antipsychotic drugs, oral contraceptive pills, antilipidemic drugs or other drugs which can interfere with thyroid function tests, patients on thyroid medications, post thyroid surgery, Patients with history of diabetes mellitus, congestive cardiac failure, chronic renal failure and hypothesis-hypothalamic disorders and patients who are not willing to participate were excluded from the study.

A structured questionnaire was designed for evaluating hypothyroid symptoms in all diagnosed patients. These symptoms were weight gain, fatigue, cold intolerance, alopecia, muscle cramps, hirsutism, menstruation irregularities, and dry skin.

Lab Investigations

Fasting venous blood sample was collected from all the subjects into Plain tubes which were allowed to clot and serum was separated by centrifugation at 3000 rpm for 15 min. The separated serum was transferred into appropriately labelled aliquots and stored at -80⁰ C until biochemical analysis was done. Serum Thyroid

Stimulating Hormone (TSH), T4, T3 and Prolactin were measured by Chemiluminescence immunoassay (CLIA) method.

Normal Ranges were taken as :

Serum Prolactin : 5-35ng/ml(females), 3-25ng/ml(males) ; T3: 69-215 µg/dL, T4: 5.2-12.7 µg/dL, TSH: 0.35-5.5 µIU/ml

Hypothyroid: Serum thyroxine (T4) <5ng/ml and TSH >5.50µU/mL,

Hyperthyroid: Serum thyroxine (T4) >14 ng/ml and TSH < 0.35 µIU/mL.

Subclinical hypothyroidism: Normal serum T4 and TSH>5.50µIU/mL,

Subclinical hyperthyroidism: Normal serum T4 and TSH < 0.35 µIU/mL.

Statistical Analysis

The data collected was analysed statistically with the help of SPSS software (version 20.0) Continuous variables are expressed as percentile.

OBSERVATIONS AND RESULTS

Out of the total 150 patients (of both) sexes attending OPD of tertiary health centre in the age group 15-45yrs included in the study, prevalence of subclinical hypothyroidism was the commonest entity encountered in 25 participants (16.6%) and 6 patients (4%) were diagnosed as overt hypothyroid as shown in Table 1. Hyperthyroidism was not detected in any of the 150 patients enrolled.

Table 1: Thyroid Status of the Study Group

Thyroid status	Number of patients	Male	Female
Euthyroid	119	27	92
Subclinical hypothyroid	25	2	23
Overt hypothyroid	6	1	5
Hyperthyroid	0	0	0

Prevalence of weight gain and menstrual irregularities (25.8 %) was the highest followed by alopecia (22.5%). Fatigue and Muscle cramps were more common in females than males. Cold intolerance (12.9%) was prevalent in females none of the patients exhibited dry skin complaints.(Table 2)

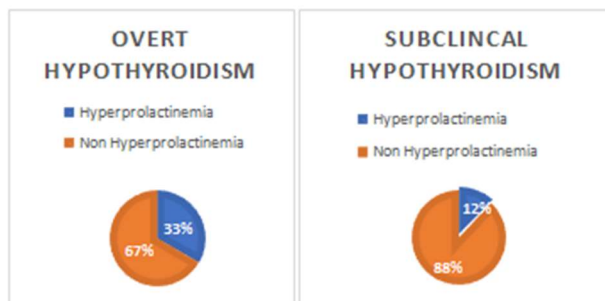
Table 2: Clinical Symptoms in Subclinical and Overt Hypothyroidism

Symptom	Male	Female
Weight gain	0	8
Fatigue	1	2
Cold intolerance	0	4
Alopecia	2	5
Muscle cramps	1	4
Hirsutism	0	3
Menstrual irregularities	0	8
Dry skin	0	0

Hyperprolactinemia was assessed in both overt and subclinical hypothyroidism patients. In our study it was more prevalent in overt hypothyroidism (33%) than in subclinical hypothyroidism (12%). (Table 3 and Fig 1 and 2) In both the groups none of the male patients were diagnosed with hyperprolactinemia.

Table 3: Prevalence of Hyperprolactinemia in Hypothyroidism

	No. of patients With Hyperprolactinemia	
	Female	Male
Subclinical Hypothyroidism	3	0
Overt Hypothyroidism	2	0



1: Overt hypothyroidism; 2: Subclinical hypothyroidism

Figure 1 and 2: Prevalence of Hyperprolactinemia in Subclinical and Overt Hypothyroidism

DISCUSSION

In the Present study, we assessed the prevalence of hyperprolactinemia in overt and subclinical hypothyroidism. Out of 150 patients included in our study, 6 patients (4%) were diagnosed as overt hypothyroidism and 25 patients (16.6%) were identified with subclinical hypothyroidism. Majority of the patients in our study group were females. Prevalence of overt and subclinical hypothyroidism was found to be more common in females than males. This is in accordance with study done by Meir *et al.*¹² and Bahar *et al.*¹³ The clinical symptoms have been summarized in table 2. On comparison, we have found that menstrual irregularities and fatigue was the most common symptom (25.8%). Alopecia was significantly higher (17.2%) in women than men (6.4%) and these results correlated with the findings of Zltautkr *et al.*¹⁴ This observation was also reported in Bahar A *et al.* study¹³ The clinical symptoms in our study are not in accordance with a study done by Carle A *et al.*¹⁵ which reported alopecia as the most common symptom. As our study was aimed at evaluating hyperprolactinemia in thyroid disorders, we have found that hyperprolactinemia was more common in overt hypothyroidism (33%) than in subclinical hypothyroidism (12%). This can be explained by the increased levels of TRH in primary hypothyroid patients. In our study, Hypothyroid females had comparatively

higher prevalence of hyperprolactinemia than males. This is attributed to hypothyroidism per se is not sufficient to cause hyperprolactinemia and other stimulus, such as estrogen, is required for this effect.¹⁶⁻¹⁷ Our study gives an insight of prevalence of hyperprolactinemia in hypothyroid disorders. It also suggests that there is an incidence of hyperprolactinemia in patients with subclinical hypothyroidism. Moreover, the prevalence in females is considerable and it may cause infertility disorders, leading to emotional and financial burden in these women. An effort should be made to check for prolactin levels in women diagnosed with hypothyroidism. If serum prolactin is found to be increased, the other causes of hyperprolactinemia should be ruled out and appropriate treatment can be given. Hence early diagnosis and timely interfere must be emphasized

CONCLUSION

It is advisable to suggest prolactin screening in patients who are diagnosed with overt hypothyroidism as well as subclinical hypothyroidism. This also implies thyroid function tests should be performed in all cases of hyperprolactinemia.

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