

Evaluation of Thyroid Hormone Deficiencies among Female Visited in Hospital: A Prospective Study

Anil Kumar Gupta

MD (General Medicine), Senior Consulted Physician,
MMG District Hospital, Ghaziabad, Uttar Pradesh, India.

Article History

Received: 09 Feb 2016

Revised: 04 Mar 2016

Accepted: 27 Mar 2016

*Correspondence to:

Dr. Anil Kumar Gupta
Senior Consulted
Physician,
MMG District Hospital,
Ghaziabad, UP, India.

ABSTRACT

Background: Hypothyroidism, a disease in which the thyroid gland does not make enough thyroid hormone, is the second most common endocrine disorder among women. It is important to obtain appropriate diagnostic tests to facilitate prompt diagnosis and treatment. A health history is useful to evaluate for symptoms of hypothyroidism, past treatment for hyperthyroidism, use of drugs that influence thyroid hormones, or a history of iodine deficiency. Hence; we planned the present study to assess thyroid deficient among females visiting the OPD of MMG District Hospital, Ghaziabad, Uttar Pradesh.

Materials & Methods: The present study included assessment of patients attending the hospital OPD with thyroid hormone deficiencies. A total of 50 patients were included in the present study. Fresh blood samples were obtained from all the patients and Thyroid-stimulating hormone (TSH) assay was done. Complete demographic details of all the patients were recorded. We also analyzed the clinical signs and symptoms present in all the patients. All the results were recorded on Microsoft excel sheet and were analyzed by SPSS software.

Results: Majority of the patients were above 50 years of age with 19 patients more than 60 years of age. We observed significant results while comparing the number of patients divided on the basis of age group and gender. We also observed significant results while evaluating the presence of type I diabetes and family history as risk factors for development of thyroid hormone deficiency.

Conclusion: Thyroid hormone deficiencies disproportionately affect women and elderly patients in higher proportion.

KEYWORDS: Hormone, Prospective, Thyroid.

INTRODUCTION

Hypothyroidism, a disease in which the thyroid gland does not make enough thyroid hormone, is the second most common endocrine disorder among women. Symptoms of hypothyroidism include fatigue, weight gain, alteration in cognition, infertility, and menstrual abnormalities. One of the common causes of hypothyroidism is Hashimoto's thyroiditis.¹⁻³

In women, the risk of developing hypothyroidism increases with age and during pregnancy, the postpartum period, and menopause. Iodine deficiency is the most common cause of hypothyroidism worldwide. One of the most common causes of hypothyroidism is Hashimoto's thyroiditis, which results from damage to the thyroid

gland caused by chronic inflammation initiated and sustained by one's own immune system.⁴⁻⁶

Women often present with myriad symptoms that are easily attributable to other disorders or simply to normal aging. It is important to obtain appropriate diagnostic tests to facilitate prompt diagnosis and treatment. A health history is useful to evaluate for symptoms of hypothyroidism, past treatment for hyperthyroidism, use of drugs that influence thyroid hormones, or a history of iodine deficiency.⁷⁻⁹

Hence; we planned the present study to assess thyroid deficient among females visiting the OPD of MMG District Hospital, Ghaziabad, Uttar Pradesh.

MATERIALS & METHODS

The present study was planned in the department of General Medicine of MMG District Hospital, Ghaziabad, UP, India. It included assessment of patients attending the hospital OPD with thyroid hormone deficiencies. A total of 50 patients were included in the present study. Written consent was obtained after explaining in detail the entire research protocol.

Inclusion Criteria

- Patients with thyroid hormone deficiencies,
- Patients between age group of 18 years and 70 years,
- Patients who gave informed consent
- Patients with negative history of any thyroid malignancy

Fresh blood samples were obtained from all the patients and Thyroid-stimulating hormone (TSH) assay was done. Electrochemiluminescence immunoassay on the automatic Analyzer was used for performing the TSH assay. The laboratory's reference value for TSH was 0.4–4.5 mIU/ml. all the values below the 0.4 mIU/ml were considered as suppressed TSH. Complete demographic details of all the patients were recorded. We also analyzed the clinical signs and symptoms present in all the patients. All the results were recorded on Microsoft excel sheet and were analyzed by SPSS software. Chi-square test was used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

Table 1: Demographic details of the patients

Parameter	No. of patients	
Age group (years)	Less than 20	1
	20- 30	1
	31- 40	7
	41- 50	10
	51- 60	12
	61 and above	19
Gender	Males	12
	Females	38

Table 2: Assessment of various risk factors for presence of thyroid hormone deficiencies

Parameter	No. of patients	P- value	
Age group (years)	Less than 50	19	0.02*
	More than 50	31	
Gender	Males	12	0.04*
	Females	38	
Type I diabetes	Present	30	0.04*
	Absent	20	
Family history	Positive	8	0.02*
	Negative	42	

*: Significant

Graph 1: Assessment of various risk factors for presence of thyroid hormone deficiencies

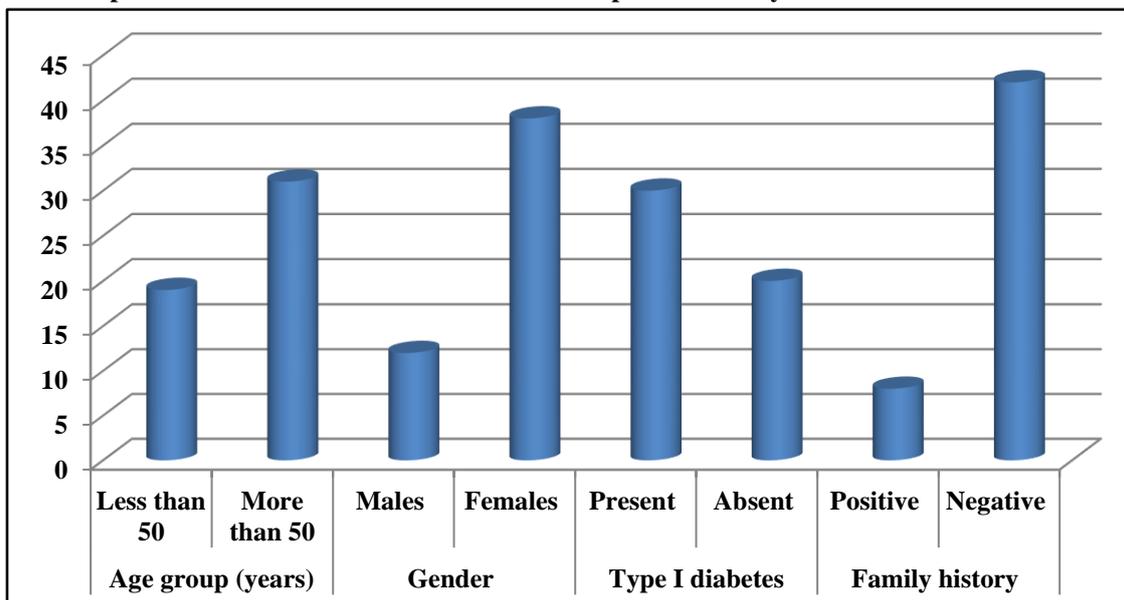
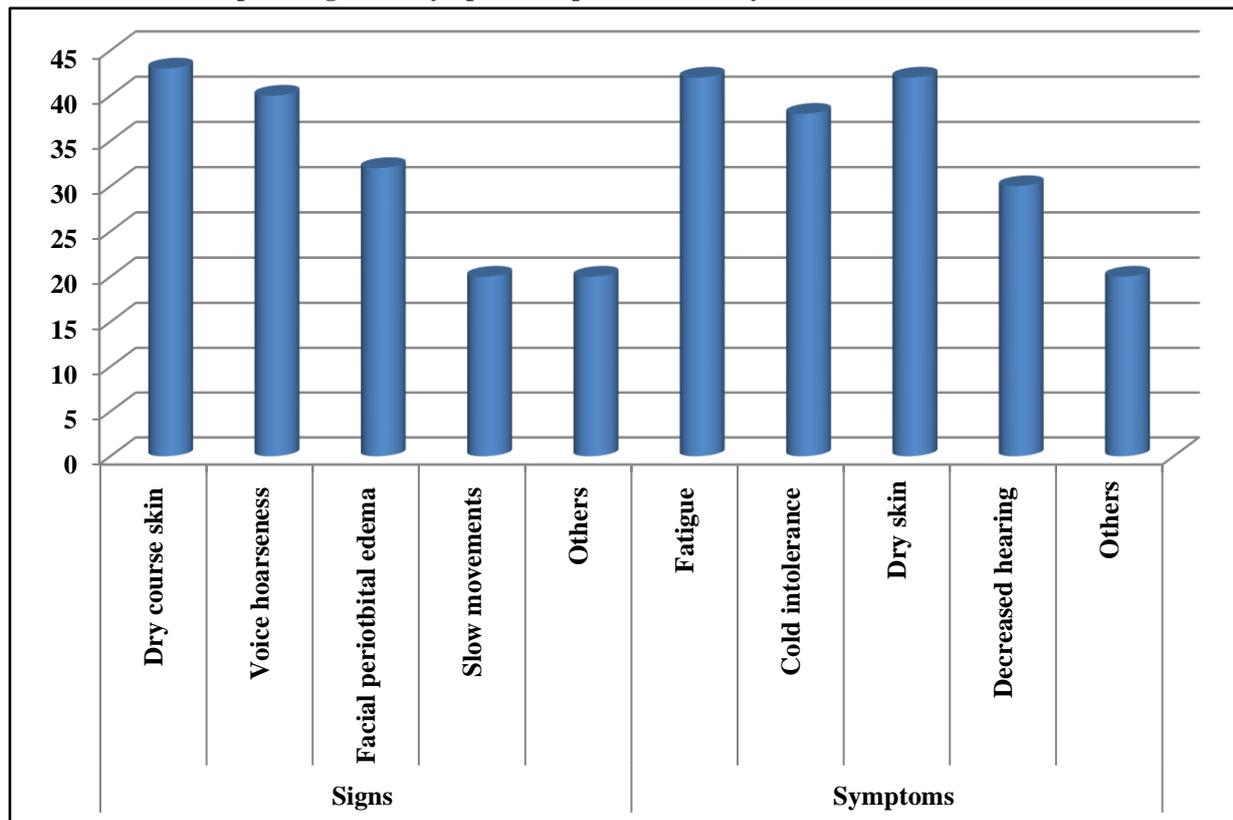


Table 3: Signs and symptoms in patients with thyroid hormone deficiencies

Parameter	No. of patients	
Signs	Dry course skin	43
	Voice hoarseness	40
	Facial periorbital edema	32
	Slow movements	20
	Others (Bradycardia, Mental impairment etc.)	20
Symptoms	Fatigue	42
	Cold intolerance	38
	Dry skin	42
	Decreased hearing	30
	Others (constipation, hair loss, weight gain etc.)	20

Graph 2: Signs and symptoms in patients with thyroid hormone deficiencies



RESULTS

We evaluated a total of 50 patients with thyroid deficiencies in the present study. Majority of the patients were above 50 years of age with 19 patients more than 60 years of age. Out of 50, 12 patients were males while remaining 38 were females. Table 1 shows the demographic details of the patients. We observed significant results while comparing the number of patients divided on the basis of age group and gender (P-value < 0.05). Table 2 shows the assessment of various risk factors for presence of thyroid hormone deficiencies. We also observed significant results while evaluating the presence of type I diabetes and family history as risk factors for development of thyroid hormone deficiency as shown in Table 2 (P- value < 0.05). Common signs seen in patients in the present

study included Dry course skin, Voice hoarseness, facial periorbital edema, slow movements etc. Common symptoms seen in patients in the present study included Fatigue, cold intolerance, dry skin, decreased hearing etc.

DISCUSSION

In the present study, we observed significant results while comparing the number of patients divided on the basis of age group and gender. We also observed significant results while evaluating the presence of type I diabetes and family history as risk factors for development of thyroid hormone deficiency. González-Rodríguez LA et al determined the prevalence of hypothyroidism in an adult female population in Puerto

Rico and to determine the relationship between hypothyroidism, bone mineral density and vertebral and non-vertebral fractures in this population. Data from the 400 subjects database of the Latin American Vertebral Osteoporosis Study (LAVOS), Puerto Rico site was reviewed. Patient's medical history, anthropometric data, current medications, laboratories, and DXA results was extracted. Subjects with thyroid dysfunction were identified based on their previous medical history and levels of TSH. Bone Mineral Density was classified using the World Health Organization criteria. Crude prevalence of thyroid dysfunction were estimated with a confidence of 95% and weighted by the population distribution by age, according to the distribution by age group in the 2000 census. Bone mineral densities and prevalence of vertebral and non-vertebral fractures were compared among the groups. The weighted prevalence of hyperthyroidism in this population was 0.0043% (95% CI: -0.0021%, 0.0107%). The weighted prevalence of hypothyroidism was 24.2% (95% CI: 19.9%, 28.4%). Increased prevalence of hypothyroidism was found in participants 70 years or older. The mean BMD at spine, hip and femoral neck was similar among the groups. No difference in the proportion of participants with vertebral and non-vertebral fractures was found among the groups. Their study found a high prevalence of hypothyroidism among adult postmenopausal females in Puerto Rico.¹¹

Rajput R et al evaluated the prevalence of thyroid dysfunction, especially hypothyroidism during the first trimester of pregnancy. The present cross-sectional study was conducted at Department of endocrinology and antenatal clinic in the Obstetrics and Gynecology Pt. B.D. Sharma PGIMS, Rohtak over a period of 1-year. The total sample population comprised of 461 pregnant women with uncomplicated intrauterine singleton pregnancies in the first trimester of gestation without any history of thyroid disease or intake of any thyroid medication. Morning blood samples from the participants were analyzed for thyroid function tests, which included FT3, FT4, thyroid-stimulating hormone (TSH) and anti-thyroid peroxidase antibodies (TPO). A total of 461 women were enrolled for this study. Mean maternal age was 23.79 ± 3.47 years. Median gestational age was 8 weeks 5 days. The median FT3, FT4 and TSH were 3.3 pg/mL, 1.25 ng/dL, and 1.40 mIU/L, respectively. Anti-TPO was elevated in 128 (27.8%) pregnant women. 99 (21.5%) women had sub-clinical hypothyroidism and 39 (39.4%) among them were positive for anti-TPO ($P \leq 0.001$). 2 (0.4%) of women had overt hyperthyroidism, whereas 15 (3.3%) of the women had sub-clinical hyperthyroidism. Considering the immense impact that maternal thyroid dysfunction has on maternal and fetal outcomes, prompt identification of thyroid dysfunction and its timely treatment is essential.¹²

Velayutham K et al conducted a study in female college students in seven colleges in Madurai District, Tamil Nadu. Thyroid-stimulating hormone (TSH) was used as the screening test to diagnose thyroid dysfunction. The abnormal TSH values were classified as mild TSH elevation (TSH 4.5–10 mIU/ml), significant TSH elevation (TSH > 10 mIU/ml), and low TSH (TSH < 0.4 mIU/ml). A total of 1292 subjects were screened of whom 161 subjects (12.5%) had abnormal TSH. The overall prevalence of elevated TSH was 11% out of which 9.7% had mild TSH elevation. A low TSH was seen in 1.3% of the study population. Thyroid dysfunction was common in young women in south India. One out of every eight young women had thyroid dysfunction, and mild TSH elevation was the most common abnormality.¹⁰

CONCLUSION

Under the light of above results, the authors concluded that thyroid hormone deficiencies disproportionately affect women and elderly patients in higher proportion. The signs and symptoms of these conditions are more subtle in nature. Hence; further research is required for better exploration of this field of endocrinology.

REFERENCES

1. Paul TV, Selvan SA, Asha HS, Thomas N, Venkatesh K, Oommen AT. et al. Hypovitaminosis d and other risk factors of femoral neck fracture in south indian postmenopausal women: A pilot study. *J Clin Diagn Res.* 2015;9(6):OC19–22.
2. Lips P. Suboptimal vitamin d status: A risk factor for osteoporosis? *Adv Nutr Res.* 1994;9:151–66.
3. Holick MF. Vitamin d deficiency. *N Engl J Med.* 2007;357(3):266–81.
4. Stocklin E, Eggersdorfer M. Vitamin d, an essential nutrient with versatile functions in nearly all organs. *Int J Vitam Nutr Res.* 2013;83(2):92–100.
5. Sendak RA, Sampath TK, McPherson JM. Newly reported roles of thyroid-stimulating hormone and follicle-stimulating hormone in bone remodelling. *nt Orthop.* 2007;31(6):753–757.
6. Benseñor IM, Goulart AC, Lotufo PA, Menezes PR, Sczufca M. Prevalence of thyroid disorders among older people: results from the São Paulo Ageing & Health Study. *Cad Saude Publica.* 2011;27(1):155–161.
7. Mazziotti G, Porcelli T, Patelli I, Vescovi PP, Giustina A. Serum TSH values and risk of vertebral fractures in euthyroid post-menopausal women with low bone mineral density. *Bone.* 2010;46(3):747–751.
8. Aaron JE, Gallagher JC, Anderson J, Stasiak L, Longton EB, Nordin BE. et al. Frequency of osteomalacia and osteoporosis in fractures of the proximal femur. *Lancet.* 1974;1(7851):229–33.
9. Stolarczyk A, Horvath A, Szczechura M, Kaminska M, Dziechciarz P. High prevalence of vitamin d

insufficiency in community-dwelling postmenopausal polish women. *Prz Menopauzalny*. 2014;13(5):289–92.

10. Velayutham K, Selvan SSA, Unnikrishnan AG. Prevalence of thyroid dysfunction among young females in a South Indian population. *Indian Journal of Endocrinology and Metabolism*. 2015;19(6):781-784. doi:10.4103/2230-8210.167546.

11. González-Rodríguez LA, Felici-Giovanini ME, Haddock LH. Thyroid Dysfunction in an Adult Female Population: A population-based study of Latin American Vertebral Osteoporosis Study (LAVOS) - Puerto Rico Site Hypothyroidism in LAVOS-Puerto Rico site. *P R Health Sci J*. 2013 Jun; 32(2): 57–62.

12. Rajput R, Goel V, Nanda S, Rajput M, Seth S. Prevalence of thyroid dysfunction among women during the first trimester of pregnancy at a tertiary care hospital in Haryana. *Indian Journal of Endocrinology and Metabolism*. 2015;19(3):416-419. doi:10.4103/2230-8210.152791.

Source of Support: Nil.

Conflict of Interest: None Declared.

Copyright: © the author(s) and publisher. IJM RP is an official publication of Ibn Sina Academy of Medieval Medicine & Sciences, registered in 2001 under Indian Trusts Act, 1882.

This is an open access article distributed under the terms of the Creative Commons Attribution Non-commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Cite this article as: Anil Kumar Gupta. Evaluation of Thyroid Hormone Deficiencies among Female Visited in Hospital: A Prospective Study. *Int J Med Res Prof*. 2016, 2(2); 370-74.