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Research Article

Clinical spectrum of hypothyroidism: a cross sectional study in Puducherry, South India

Darshan Savery M.[1], Vijay Prasad C.[1], Vishnu Prasad R.[2]*

[1]Department of General Medicine, Sri Venkateshwaraa Medical College Hospital and Research Center, Puducherry, India
[2]Department of Community Medicine, Pondicherry Institute of Medical Sciences, Puducherry India

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***Correspondence:**
Dr. Vishnu Prasad R,
E-mail: vishnuprasath2@gmail.com

ABSTRACT

Background: Hypothyroidism is characterised by underactive thyroid gland where there is reduced synthesis and secretion of thyroid hormones by the gland. With nearly one fifth of the population affected by hypothyroidism it is important to understand the clinical presentation of the disease. The present study aims to explore various clinical signs and symptoms of patients with hypothyroidism in Puducherry, South India.
Methods: The study was carried out as a cross sectional study in a tertiary care medical college hospital, Puducherry among 213 patients who are admitted for various reasons and found to have hypothyroidism on laboratory investigations. With help of specialists in various fields all the patients were evaluated thoroughly and findings of the history and examination were noted down. Data entry was done in Epi Data version 3. Means and proportions were calculated using the software SPSS version 21.
Results: Most of the hypothyroid patients (168/213) were females, giving a female: male ratio of approximately 3.4: 1. Primary hypothyroidism was found in most of the study participants (91%) and sub clinical hypothyroidism was seen in 6.2% of the patients. Commonest clinical presentation of the hypothyroid patients were fatigue (83.6%), weight gain (66.7%), were dry/coarse skin (52.1%) and voice change (50.7%).
Conclusions: The commonest symptom being fatigue and weight gain while the commonest clinical sign was dry skin and voice change.

Keywords: Hypothyroidism, Symptoms, Signs, Clinical spectrum

INTRODUCTION

Hypothyroidism is characterised by underactive thyroid gland where there is reduced synthesis and secretion of thyroid hormones by the gland. The prevalence of hypothyroidism among Indian adult population was found to be around 10% and subclinical hypothyroidism was found to be prevalent among 8% of the population.[1] Similarly the prevalence of clinically palpable goitre was observed in nearly 12% of the south Indian adult population.[2] With nearly one fifth of the population affected by hypothyroidism it is important to understand the clinical presentation of the disease so as to enhance better understanding of the natural history of the disease. Also, knowledge about the signs and symptoms of hypothyroidism helps in early identification and diagnosis of the disease. However hypothyroidism is found to present with a wide spectrum of clinical manifestations, which might range of subclinical or overt disease to multi organ dysfunction.[3,4] Iodine intake is found to be inversely associated with hypothyroidism. Deficiency in dietary iodine intake is found to be

associated with the occurrence of hypothyroidism and iodisation of salt is found to be an effective strategy to prevent iodine deficiency and hypothyroidism.[5-7] South East Asia region is found to have the largest number of children with school age children having low iodine intake.[8] Hashimoto's Thyroiditis is the commonest cause of hypothyroidism in places where the iodine intake is adequate.[9] Diagnosis and treatment of hypothyroidism is very often considered to be simple when clinical features are established and with the estimation of TSH (Thyroid Stimulating Hormone) and thyroid hormone status. With nearly one fifth of the affected population and clearly established causative factors and treatment guidelines, early diagnosis and initiation of treatment is of prime importance. Because of the nature of the disease to occur in subclinical forms and wide clinical spectrum of presentation it is important to study all the possible clinical presentation of patients with hypothyroidism. Hence this study was an attempt to explore various clinical signs and symptoms of patients with hypothyroidism in Puducherry, South India.

METHODS

The study was carried out as a cross sectional study in a tertiary care medical college hospital, Puducherry. Puducherry is a Union Territory in South India along the east coast. The Hospital caters to a population of approximately one million from Pondicherry, Villupuram and Cuddalore Districts. The study was conducted among 213 patients who are admitted for any illness in the hospital during the period of 2013 December to 2014 December and presented with clinical features suggestive of Hypothyroidism. Study participants were recruited based on the pre-determined inclusion and exclusion criteria. Inclusion Criteria: Patients who age 16 years and above, patients with history and clinical features suggestive of hypothyroidism and diagnostic hormone levels i.e. decreased T_3 and T_4 with increased TSH levels in cases of primary hypothyroidism or depressed TSH levels in cases of secondary hypothyroidism. Exclusion Criteria: Patients who are not willing to consent and participate in the study were excluded. Since all the eligible study participants during the period of data collection were included in the study no sample size calculation was done. However we found that our sample size was adequate for a power of 80% and 95% confidence limits.

All the study participants were explained about the procedure of the examinations and implication of the study in local vernacular language and informed written consent was obtained prior to interview and examination. Institute ethical committee approval and certification was obtained before starting the study. After admission of the patient in the hospital under any specialty and following confirmation of diagnosis of hypothyroidism, a detailed history and physical examinations were done by the investigators DSM and CVP in the concerned wards where the patients were admitted. Standard procedures and guidelines were followed in clinical examination of the patients. A predesigned, pilot tested semi-structured questionnaire was used for data collection so that no clinical symptom or sign may be missed out during interview and examination. All the patients included in the study were evaluated by specialists in Neurology, Dermatology, Cardiology, Obstetrics & Gynecology, Otorhinolaryngologist and Psychiatry so as to validate the symptoms and signs of the patients. Statistical Analysis: Data entry was done in Epi Data Version 3 and analysis was done for calculation means and proportions using SPSS version 21.

RESULTS

Two hundred and thirteen patients were enrolled in the study at the end of one year data collection period. Majority of the participants, 52.1% were in the age of group of 31-50 years. Most of the hypothyroid patients (168/213) were females, giving a female: male ratio of approximately 3.4:1. Primary hypothyroidism was found in most of the study participants (91%) and sub clinical hypothyroidism was seen in 6.2% of the patients. Maximum of the patients, 42.7% had perceived their symptoms for a period of less than 6 months. General Medicine or Internal Medicine was the department to which most of the patients, 72.3% presented themselves and were diagnosed later (Table 1).

Table 1: Baseline characteristics of study participants (n=213).

	Frequency	Percentage
Age (in years)		
16 – 30	33	15.5
31 – 50	111	52.1
51 – 70	56	26.3
>70	13	6.1
Gender		
Male	45	21.1
Female	168	78.9
Type of Hypothyroidism		
Primary	194	91.0
Secondary	6	2.8
Sub-Clinical	13	6.2
Duration of Symptoms		
< 6 months	91	42.7
6 months to 2 years	43	20.2
> 2 years	66	31.0
NIL	13	6.1
Departments to which initially presented to		
General Medicine	154	72.3
General Surgery	23	10.8
OBG	13	6.1
Others*	23	10.8
Total	213	100.0

***** Psychiatry, Dermatology, Ophthalmology, Orthopedics, ENT, Cardiology

Commonest symptoms with which the hypothyroid patients presented were fatigue (83.6%), weight gain (66.7%), decreased appetite (49.8%), voice change (45.4%) and cold intolerance (41.3%). Menorrhagia (31.5%) was the commonest gynaecological manifestation among females with hypothyroidism. Dry skin was seen in 27.2% of the hypothyroid patients (Table 2).

Table 2: Presenting symptoms of patients with hypothyroidism (n=213).

Symptoms	Frequency	Percentage
General symptoms		
Cold intolerance	88	41.3
Voice change	103	45.4
Fatigue	178	83.6
Weight gain	142	66.7
Neuromuscular		
Muscle aches	26	12.2
Carpel tunnel syndrome	23	10.8
Deafness	24	11.3
Altered sensorium	16	7.5
Ataxia	6	2.8
Seizures	10	4.7
Dermatological		
Myxedema	44	20.6
Dry skin	58	27.2
Alopecia	19	8.9
Gastro-Intestinal		
Decreased appetite	106	49.8
Constipation	63	29.6
Cardiorespiratory		
Chest pain	14	6.6
Dyspnoea	24	11.3
Sleep apnoea	6	2.8
Reproductive*		
Amenorrhoea	12	7.1
Menorrhagia	53	31.5
Metrorrhagia	26	15.5
Oligomenorrhea	Nil	Nil
Obstetric*		
Threatened abortion	6	3.6
Post-partum hemorrhage	3	1.8
Psychiatric manifestations		
Psychosis	2	0.9
Bipolar affective disorder	6	2.8
Depression	2	0.9
History suggestive of etiology		
Anti-thyroid drugs	6	2.8
Lithium	6	2.8
Radio iodine therapy	6	2.8
Thyroid surgery	8	3.7
History of associated diseases		
Type 2 Diabetes Mellitus	18	8.5
Ischemic Heart Disease	20	9.4

* n = 168 (only among females)

With respect to the clinical signs with which the hypothyroidism patients presented, the commonest were dry/coarse skin (52.1%), voice change (50.7%), delayed DTR (Deep tendon reflex) relaxation (40.4%), memory impairment (16.9%) and thyroid goiter (16%). Deafness was seen in 13.1% of the patients with hypothyroidism and there was equal distribution of sensory neural and conductive deafness (Table 3).

Table 3: Presenting signs in patients with hypothyroidism (n=213).

Findings/ Signs	Frequency	Percentage
Resting pulse rate		
< 60/min	32	15.0
61 to 70	48	22.5
71 to 80	61	28.6
> 80	72	33.8
Alopecia	18	8.4
Dry/coarse skin	111	52.1
Voice change	108	50.7
Thyroid goiter	34	16.0
Malar flush	18	8.4
Brittle nails	12	5.6
Carotenemia	10	4.6
Memory impairment	36	16.9
Proximal muscle weakness	13	6.1
Delayed DTR relaxation	86	40.4
Cerebellar signs	6	2.8
Pleural effusion	2	0.9
Muscle tenderness	6	2.8
Papilloedema	4	1.9
Deafness	28	13.1
Conductive deafness	14	6.6
Sensory Neural deafness	14	6.6

DISCUSSION

The present study evaluated the clinical profile of two hundred and thirteen patients who are diagnosed to have hypothyroidism. Majority of the patients in the present study were middle aged similar results were also observed in other studies by Saha PK et al and Vanderpump MPJ et al.[10,11] Female preponderance in the prevalence of hypothyroidism was also reported by Saha PK et al and Ahamed N et al.[10,12]

The commonest symptom of patient with hypothyroidism in our study was fatigue which was observed in 83% of patients. This correlates with data from different studies. In a population based study done at Netherlands it was observed that in subjects with known thyroid disorders, the rate of fatigue increased to 50%, and was independent of the TSH level; whereas in euthyroid patients it was 34%.[13] Wayne EJ et al, in his review, claimed that 98% of hypothyroid patients complained of physical tiredness.[14] Symptoms of fatigue, muscle weakness, lethargy, and

weight gain are often reported among hypothyroid patients.[15]

Thyroid hormones are found to have profound effects on reproduction and pregnancy. Dysfunction of the thyroid gland is implicated in a broad spectrum of reproductive manifestations, ranging from menstrual irregularities to pregnancy loss.[16,17] In a study done by Canaris GJ et al it was seen that Hoarse voice (17%), dry skin (71%), Constipation (17%), poor memory (18%), cold intolerance (51%), menstrual irregularities (30%) and tiredness (40%) were observed among the hypothyroid patents, the results of which are in line with our study results.[18] Golding DN demonstrated a delayed DTR in patients with hypothyroidism which is similar to the observation in our study.[19] Hypothyroidism is also found to increase the risk for critical mood deterioration by seven fold in a research work carried by Larisch R et al.[20] Bipolar affective disorders are found to be associated with the occurrence of hypothyroidism and its treatment, which was demonstrated in a study conducted by Bauer MS et al.[21] The strength of the present study is that a comprehensive evaluation of all the symptoms and signs was done in patients with hypothyroidism. Also standard diagnostic criteria and examination guidelines were followed and performed by various experts in the concerned fields for clinical examination of all the patients. The present study is also one of the unique research work carried out in the region. Some of the possible limitations could be that the research work was carried out on hospital cases since detailed evaluation by specialists is not feasible for cases recruited from the community.

CONCLUSION

The commonest symptom being fatigue and weight gain while the commonest clinical sign was dry skin and voice change. Occurrence of hypothyroidism was found to be high among middle aged people with female preponderance.

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