Original article

Prevalence, clinical presentation and aetiology of hypothyroidism in elderly: A hospital-based study from Assam, India

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Abstract:

Background: Clinical presentation of hypothyroidism in old age poses a challenge for the physician as most of the manifestations seem to be age related. Hypothyroidism in old age is a low priority issue among physicians and hence neglected. Limited literatures are available from north eastern part of India especially among elderly. As it affects many domains of health of the elderly, it is very much crucial for early diagnosis and interventions of hypothyroidism.

Objectives: To study the prevalence of hypothyroidism along with its clinical presentation and etiology.

Materials and methods: A hospital based study was conducted among elderly patients attending Geriatric and Medicine Outdoor of Gauhati Medical College and Hospital with symptoms suggestive of hypothyroidism. A detailed clinical and laboratory evaluation of Free T3, Free T4, Thyroid Stimulating Hormone (TSH) were done. Patients were categorized as Overt and Sub-Clinical hypothyroid. Known or diagnosed cases who were on thyroid supplement were considered as Overt type. Hypothyroid patients were further evaluated for Anti TPO antibody. Clinical manifestations were studied among hypothyroid and euthyroid patients presenting with manifestations suggestive of hypothyroidism. It was tried to assess the aetiology. This was done from relevant history and assessment of Anti TPO antibodies.

Results: The prevalence of overall hypothyroidism was 20.38% and Subclinical (60%) was the majority. Age and gender was not significantly associated with it. Clinical presentation of both hypothyroid and euthyroid patients were easy fatigability and generalised weakness. Autoimmunity was the main aetiology found.

Conclusion: A reasonably high prevalence of hypothyroidism among elderly demands screening for thyroid profile even with non-specific symptoms. Clinical manifestations alone could not be relied for diagnosing hypothyroidism. Further community based studies are required in this regard.

Key Words: Hypothyroidism, Overt hypothyroidism, Subclinical hypothyroidism, elderly.

Introduction:

Along with the whole world, India is also experiencing the phenomenon of 'Population Ageing'. The elderly population (60 years and above) has increased exponentially in the last few decades. Along with other morbidities, thyroid disorders particularly hypothyroidism increases with age. Hypothyroidism is common in elderly and if untreated, is associated with significant morbidity.[1] Epidemiologic studies have shown a possible association between subclinical and overt thyroid disorder and cardiovascular disease.[2-4] The relationship between overt hypothyroidism and deficits in cognitive functioning and other clinical endpoints is relatively well established.[5,6] The prevalence of subclinical hypothyroidism (SCH), which is characterized by normal free thyroxine (FT_4) and elevated thyrotropin (TSH) levels,

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increases with aging.[7,8] Persons with SCH are more vulnerable for development of Overt hypothyroidism(OH). Subclinical hyperthyroidism may be associated in older adults with decreased bone mineral density, fractures and cognitive impairment.[9,10] The diagnosis of abnormal thyroid hormone concentrations in people aged >60 years poses a challenge, as the clinical presentation of thyroid dysfunction is usually nonspecific, and ageing is associated with a number of physiological changes that can affect thyroid function test results. Furthermore, the presence of acute or chronic non-thyroidal illnesses and the use of medications that interfere with thyroid function tests are common confounders in the determination of thyroid status in the elderly. Early diagnosis and treatment of overt thyroid dysfunction is crucial in this population in view of the marked effects of abnormal circulating thyroid hormone levels on a number of organ systems, including the heart, the skeleton and the neurological system.[11] However, there is paucity of studies on hypothyroidism among elderly especially from north eastern part of the India. Considering all these facts, the present study was undertaken to find out the prevalence of overt and subclinical hypothyroidism and to study the clinical manifestations of hypothyroidism along with its aetiology among elderly.

Materials and methods:

A hospital-based cross-sectional study was conducted during July 2013 to June 2014. Elderly patients aged 60 years and above attending Medicine and Geriatric Out Patient Department (OPD) of Gauhati Medical College and Hospital (GMCH) with classical symptoms suggestive of hypothyroidism or nonspecific symptoms like fatigue, lethargy, anorexia, weight gain etc. were included in the study. Known patients of hypothyroidism who were on thyroid hormone supplements were considered as hypothyroid irrespective of their current thyroid status. Written informed consent was obtained from each patient. Those who failed to give consent and critically ill patients were excluded from the purview of study. Thus, a total of 206 elderly patients were considered for the study. These patients were subjected to detailed clinical examination and laboratory evaluation. Clinical examination was done keeping in mind the signs and symptoms of hypothyroidism. Serum Free T3 (FT3), Free T4 (FT4), and Thyroid Stimulating Hormone (TSH) were done for every patient. Hypothyroidism has been divided into 2 categories - Overt Hypothyroidism (OH) and Subclinical Hypothyroidism (SCH). Known or diagnosed cases of hypothyroidism who were on thyroid supplementation were considered as OH irrespective of their current thyroid status. However, patients who gave history of hypothyroidism without documentation and thyroid profile was normal at the time of interview in absence of history of thyroid supplementation were not considered as hypothyroid. This was done to minimise the selection bias. Patients with high TSH and low FT4 were diagnosed as having overt hypothyroidism, whereas those with high TSH and normal FT4 and FT3 were diagnosed as subclinical hypothyroidism. Clinical presentations were studied between hypothyroid patients and euthyroid patients presenting with manifestations suggestive of hypothyroidism. Attempt was made to see the aetiology of hypothyroidism. So, the patients who were found to be hypothyroid as per the above mentioned criteria were further evaluated for Anti – Thyroid Peroxidase (Anti TPO) antibody. The cause that happened first in the causation history obtained from the patient have been considered as the etiology in presence of multiple etiology. Chemiluminescence immune assay method was used for estimation of thyroid profile and Anti TPO

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antibody. Normal value for FT4, FT3 , TSH and Anti TPO antibody has been taken as 10-28pmol/L, 4.26-8.10pmil/L, 0.4-4.0nmol/L and <100 IU/L respectively. Evaluation of other aetiology was done from history. Statistical analysis was done using GraphPad InStat (Demo version). For testing the association, Fisher Exact test was applied. And *p*-value < 0.05 was considered as significant.

Results and observations:

Out of the total 206 elderly examined, 130 (63.10%) belonged to 60-69 years age group and 149(72.33%) were male. Out of them, 42 (20.38%) were found to be hypothyroid. Out of the total hypothyroid patients, almost 60% were subclinical hypothyroid (SCH) and 17 (40.48%) patients were found to be OH cases. Out of these OH cases, 10 were (58.82%) were newly diagnosed OH and 7(41.18%) were old cases (known or diagnosed cases who were on thyroid supplements).

Table 1 revealed the age-wise and sex-wise distribution of hypothyroid cases. The prevalence of hypothyroidism was more in 60-69 years age group. Most of the hypothyroids were females (69.05%). But, the relationship between age and gender with hypothyroidism was not statistically significant.

Table1. Age-wise and gender-wise distribution of hypothyroidism

	Hypothyroidism		Total (%)	*p*-value
	OH (%)	SCH (%)		
Age (yrs)				
60-69	11 (37.93)	18 (62.07)	29 (100.00)	0.7570
≥70	6 (46.15)	7 (53.85)	13 (100.00)	
Gender				
Male	7 (43.75)	9 (56.25)	16 (100.00)	0.7377
Female	10 (38.46)	16 (61.54)	26 (100.00)	
Total			42 (100.00)	

Note: Figure in brackets indicate row-wise percentage

Table 2 .Clinical manifestations of hypothyroid patients

Clinical manifestations*	Hypothyroidism	
	OH (n=17)	SCH (n=25)
Easy fatigability	13 (76.47)	21(84.00)
Generalised weakness	12 (70.59)	21 (84.00)
Weight gain	5 (29.41)	4(16.00)
Anorexia	11 (64.71)	3(12.00)
Dry skin	4 (23.53)	7(28.00)
Pedal oedema	10 (58.82)	6(24.00)
Goitre	0 (00.00)	2(8.00)

*Multiple responses

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Table 2 describes the different clinical symptoms reported by the patients. All the newly diagnosed patients with OH complained of easy fatigability and generalized weakness. All the 7 cases of OH who were on thyroid supplementation had anorexia. Also, 84% of SCH patients complained of easy fatiguability and generalized weakness. Pedal oedema was seen to be more pronounced (58.82%) in OH.

Table 3 shows the euthyroid subjects with clinical manifestations suggestive of hypothyroidism. Easy fatiguability and generalized weakness was reported by all the euthyroid patients.

Table 3. Clinical manifestations of Euthyroid cases

Clinical symptoms	No. of patients (%) (n=164)
Easy fatigability	164 (100.00)
Weakness	164 (100.00)
Dry skin	59 (35.98)
Pedal oedema	30 (18.29)

*multiple responses

In the present study, it was tried to assess the aetiology of hypothyroidism. Table 4 revealed the aetiology of hypothyroidism. More than 60% were found to be positive for Anti-TPO antibodies.

Table 4. Aetiology of hypothyroidism

Aetiology	OH (%)	SCH(%)	Total (%)
Autoimmune (Anti TPO +ve)	10 (58.82)	16 (64.00)	26 (61.90)
Post thyroid surgery	1 (5.88)	5 (20.00)	6 (14.28)
H/O of anti-thyroid drugs	0 (00.00)	4 (16.00)	4 (9.52)
Could not determine	6 (35.29)	0 (00.00)	6 (14.28)
Total	17 (100.00)	25 (100.00)	42 (100.00)

Discussion:

The present study was conducted among elderly patients attending GMCH for various health problems. Limited literatures are available regarding prevalence of hypothyroidism in elderly especially from North-Eastern India. In the present study, the overall prevalence was found to be comparatively high (20.38%) with a remarkably higher prevalence of SCH (59.52%). However, various population based studies done in different parts of the globe revealed comparatively lower prevalence than the present study.[4,12-4] In the original cohort of the Framingham Study, the prevalence of thyroid deficiency was 4.4%.[15]. In a hospital based study done in Bikaner, India, the prevalence was found to be 13.2%.[16] Almost similar prevalence (20%) was seen in a study done by Madhuvan and his co-workers.[17] This high prevalence in the present study could be an eye-opener for physicians to look into the hidden problem. Hospital setting of the study could be one of the causes for this high prevalence. Further community based studies are required in this regard. The reported prevalence of hypothyroidism among older adults varies in different research literature due to the use of diverse patient inclusion

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criteria and differences in groups targeted for study.[18] The prevalence of SCH was more in the present study, which is in conformity with other studies done in different parts of the globe.[12,14] Higher rates of SCH were consistently reported in women and older individuals.[17,19] In contrast to the present finding, other studies found more of OH than SCH.[17,20,21]

Although higher prevalence of both OH and SCH was seen in 60-69 years age group but the association between age and hypothyroidism was statistically non-significant. Age and gender was not found to be significantly associated with both OH and SCH in studies done in India.[14,21] The prevalence of hypothyroidism is found to be more in females in different studies across the world.[15,17,22] From Table 3 and 4, it is evident that generalized weakness and easy fatiguability were reported by both hypothyroid and euthyroid elderly. So, it becomes difficult for the physician to suspect the cases of hypothyroidism relying only on clinical manifestations. Biochemical evaluation of thyroid parameters is crucial for identifying this hidden morbidity**.** Otherwise, many cases may be missed. Considering the fact that generalized weakness and fatigue is the most pronounced clinical presentation in both OH and SCH, any elderly with such presentation should be further evaluated for the thyroid status. This will help in early interventions and effective management. Easy fatiguability (67%) followed by generalized weakness (52.5%) as presenting clinical manifestation was reported by Doucet J, and his co-workers.[23] Pedal oedema was more pronounced (70%) in OH in the present study which was in contrary to another study where oedema was not found at all.[23] Dry skin was reported almost equally by OH and euthyroid patients. It is obvious that age related changes and multiple co-morbidities of elderly surely make confusion to clinically suspect a case of hypothyroid.

While analysing the aetiology of hypothyroidism, autoimmunity was found to be the most common etiology in the study population which was in conformity with other studies.[24-5] In an another study, all OH cases were positive for anti-TPO antibodies and 66.66% of SCH also had anti-TPO antibodies positive. SCH subjects with anti-TPO positive are more likely to progress to frank hypothyroidism cases.[16] Hence, elderly with SCH should be further investigated to find out the aetiology and in this regard anti-TPO antibody estimation is crucial. Autoimmune hypothyroidism with positive anti-thyroid antibodies was found to be the main cause (59%), followed by iatrogenic (28%) in a study done in france.[26] In our study, a reasonably good number of patients (23.80%) had hypothyroidism due to iatrogenic causes. Hence, these patients should be monitored regularly to check and maintain a normal thyroid status.

Small sample size is the main limitation of the study. Also, co-morbidities, an important confounder, could not be assessed in the present study.

Conclusion: Considering the high prevalence of hypothyroidism among elderly population and the difficulties involved in diagnosing based on clinical presentation, it is imperative on the part of health professionals to screen the elderly population for thyroid function so that no cases are missed and treatment can be started at the right time. Further, community based studies with larger sample size is required in this regard.

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