



Thyroid Dysfunction in Elderly Patients and Its Clinical Presentation

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Abstract

Aim: to study the spectrum of thyroid dysfunction in a sample of Saudi elderly and to correlate clinical symptoms with abnormal thyroid function.

Design & Methods: A cross sectional study was conducted on 100 elderly subjects aged 60 years and older. Participants were recruited from Geriatric outpatient clinic at Al-Zahra General hospital in Qatif city in Al-sharqia region of kingdom of Saudi Arabia. Those who were suffering from symptoms suggestive of thyroid disorders or subjects with vague symptoms like generalized weakness, easy fatigability, lethargy were subjected to detailed clinical examination & thyroid function testing by biochemical means.

Results: Thyroid disorders were present in 20% of subjects. Overt hypothyroidism in 10%, subclinical hypothyroidism in 5% cases, hyperthyroidism in 3% and subclinical hyperthyroidism in 2% patients was noted. Females had higher incidence of thyroid disorders than males 20% versus 6%, showing a female preponderance. This was seen in both hypothyroid and hyper thyroid states. Analysis of clinical features of hypothyroidism showed that generalized weakness and easy fatigability were the most common symptoms among subjects with overt and subclinical hypothyroidism and sluggish ankle jerk was the most noted sign, while in hyperthyroidism palpitation, tachycardia and weight loss were the most common features among subjects in both overt and subclinical states.

Conclusion: Thyroid dysfunction is common in elderly and are more among females. A strong clinical suspicion of thyroid diseases should be considered in elderly patients as the symptoms are few or absent and are easily confused with coexisting illnesses.

Keywords: thyroid, elderly, clinical presentation.

Introduction

Over the past few decades, there has been a dramatic increase in the percentage of older people in the general population. The last population census shows that the proportion of elderly has risen from 3.26% in 1992 to 3.5% in 2004^(1,2). United Nations projects that the number

of Saudi elderly will be about 2.5 million persons by 2030⁽³⁾.

Several studies have investigated the role of thyroid function in the aging process. Thyroid gland undergoes Physiological changes with aging, Serum TSH concentrations decrease in healthy elderly subjects due to an age-related

decrease in TSH secretion by the pituitary. Furthermore, the nocturnal TSH peak is blunted and there is a 1-1.5 hour shift in the circadian rhythm of TSH secretion, resulting in an earlier peak^(4,5).

Although reduced TSH levels result in a reduced thyroidal T4 secretion in the elderly^(6,7), serum total and free T4 concentrations remain unchanged^(8,9). This is because T4 degradation by outer ring deiodination decreases with age^(6,7,10).

Diagnosis of thyroid disorders in elderly is more often misdiagnosed, as the symptoms are often subtle or absent and are easily confused with coexisting illnesses. Symptoms may often be attributed to normal aging, and a high index of suspicion of thyroid dysfunction in the elderly is needed. Interpretation of thyroid function tests in older adults is difficult because of the age dependent entphysiologic changes in thyroid function, coexistent chronic illness, and polypharmacy.⁽¹¹⁻¹³⁾

The incidence and pattern of thyroid diseases was studied in some areas in Saudi Arabia by some researchers (Al- Tameem, 1987; Koriesh et al., 1988; Abu-Eshy et al. 1994; Al-Zahrani et al., 2005).⁽¹⁴⁻¹⁷⁾ However little is known about thyroid disorders in Qatif area in sharqia of kingdom of Saudi Arabia, also studies addressing elder population in this field are lacking.

Hence this study was undertaken to study spectrum of thyroid dysfunction and its clinical presentation in a sample of Saudi elderly.

Subjects and Methods

A cross sectional study was conducted on 100 elderly patients aged ≥ 60 years both males and females recruited from Geriatric outpatient clinic at Al-zahra General hospital in Qatif city in Al-sharqia region of kingdom of Saudi Arabia. Subjects with clinical suspicion of thyroid disorder were subjected to detailed clinical examination & testing by biochemical means.

All participants underwent clinical assessment, medication review, cognitive assessment using

Arabic version of Mini mental status examination (normal is MMSE ≥ 24)⁽¹⁸⁾.

Patients who were acutely ill, those with established thyroid disorders, Patients on thyroid supplements and drugs known to alter the thyroid functions like amiodarone, lithium, glucocorticoids, Patients taken radioactive iodine therapy or who have undergone thyroid surgery were excluded.

All participants had laboratorial evaluation of thyroid functions done by estimation of serum free T3, T4 and TSH levels by Chemiluminescence assay method.

Two ml of blood was drawn and centrifuged and serum (500 microml) collected and incubated with the reagent (separate for T3, T4 and TSH) for 1 hour at room temperature, later readings were taken from COBAS 6000 analyser.

The normal values for the laboratory are

Free T3 0.4-1.8ng/ml

FreeT4 5- 10.7 mcg/dl

TSH 0.5- 8.9 mIU/ml

Interpretation

TSH values were higher & T3 & T4 values were lower in patients with overt hypothyroidism.

Subclinical hypothyroidism had high TSH values but T3, T4 values were within normal range.

Patients with overt hyperthyroidism had low TSH values, with increased T3, T4 levels, where as subclinical hyperthyroid patients demonstrated a normal T3, T4 values with reduced TSH levels

Statistical methods

The collected data were coded, tabulated, revised and statistically analyzed using SPSS program (version 20). Descriptive statistics were done using mean and standard deviation for numerical parametric data and by number and percentage for categorical data.

Results

1. Out of 100 elderly, 20 were found to have abnormal thyroid function tests.

2. Hypothyroidism was seen in 15% of subjects & 5% had hyperthyroidism. Ten patients showed overt hypothyroidism and 5 had Sub-clinical hypothyroidism. Overt hyperthyroidism was noted in 3 subjects and subclinical hyperthyroidism in 2 subjects.
3. In the present study of 100 patients, 40 were males and 60 were females. We have found that prevalence of thyroid dysfunction was more among females (20%) than in males (6%), showing a female preponderance. This was seen in both hypo & Hyper thyroid states.
4. Mean values of thyroid function tests among subjects is shown in (table 1)
5. Analysis of clinical features of hypothyroidism is shown in (table 2), generalized weakness and easy fatigability were the most common symptoms among subjects with overt and subclinical hypothyroidism and sluggish ankle jerk was the most noted sign.
6. Analysis of clinical features of hyperthyroidism showed that palpitation, tachycardia and weight loss were the most common features among subjects in both overt and subclinical states. (table 3)
7. The percentage of subjects with thyroid disorders was more in the age group ranging between 60-65 compared to other age groups. (table 4)

Table1: Mean and SD for thyroid function tests among subjects.

Normal (n=80)	Subjects	Hypothyroidism (n=10)	Subclinical Hypothyroidism (n=5)	Hyperthyroidism (n=3)	Subclinical Hyperthyroidism (n=2)
TSH	3.11±1.66	45.62±18.96	13.94±2.33	0.01 ±0.02	0.49±0.08
T3	1.20±0.53	0.73±0.44	1.15±0.29	5.30±1.62	1.48±0.96
T4	6.92±1.80	3.31±2.80	5.62±2.39	22.8±2.89	10.22±2.40

Table2 : Clinical features of hypothyroidism among subjects.

	Clinical (total n=10)		Subclinical (total n=5)	
symptoms	n	%	n	%
Easy fatigability	10	100	5	100
Generalized weakness	10	100	5	100
Lethargy	8	80	4	80
Loss of interest	2	20	0	0
Swelling of limbs/face	8	80	1	20
Weight gain	6	60	2	40
Constipation	5	50	2	40
signs				
Sluggish ankle jerk	8	80	2	40
Dry/coarse skin	7	70	1	20
Hoarseness of voice	5	50	0	0
Goiter	5	50	0	0
Bradycardia	4	40	0	0
Dementia	1(MMSE <24)	10	0	0

Table3 : Clinical features of hyperthyroidism among subjects

	Clinical n=3		Subclinical n= 2	
symptoms	n	%	n	%
Heat intolerance	1	33.3	0	0
palpitations	2	66.6	1	50
Weight loss	2	66.6	1	50
Loss of interest	1	33.3	0	0
Increase appetite	0	0	0	0
Diarrhea	1	33.3	0	0
Nervousness	1	33.3	1	50
signs				
Goiter	1	33.3	0	0
Tachycardia/AF	2	66.6	1	50
Tremors	1	33.3	0	0
Exophthalmous	1	33.3	0	0

Table 4: Distribution of thyroid disorders in age groups

Age groups	Thyroid disorder%
60-65	45
66-70	23
71-82	17

Discussion

Thyroid diseases are common clinical problems associated with aging. A total of 100 patients were included in the present study. Thyroid disorders were present in 20% of subjects. Overt hypothyroidism in 10%, subclinical hypothyroidism in 5% cases, hyperthyroidism in 3% and subclinical hyperthyroidism in 2% of subjects.

Reviewing literature, *Bensenor et al* reported that subclinical hyperthyroidism is more common than overt hyperthyroidism in elderly which is estimated to have a prevalence of 3–8%⁽¹⁹⁻²¹⁾. while Results of *Madhavan et al* study conducted on 100 elderly from bangalore city in India showed that overt thyroid disorders both hypo and hyper are more common than subclinical which agreed with our study results, this could be attributed to the late presentation of the population who had lack of knowledge about their symptoms.

In the current study, of 100 patients, 40 were males and 60 were females. The prevalence of thyroid dysfunction was more among females (20%) than in males (6%), showing a female predominance. This was seen in both hypo & Hyper thyroid states.

A study by *Al tameem* conducted to find out the prevalence of thyroid diseases among patients in Makkah area, showed that thyroid disorders both hypo and hyper were more common among females⁽¹⁴⁾, also *Morganti et al* reported that hyperthyroidism is more common in women than men, especially in patients over the age of 70⁽²²⁾. Moreover, the most recent National Health and Nutrition Examination Survey (NHANES) reported that a significantly greater number of women aged 50–69 met criteria for subclinical and clinical hypothyroidism compared to men in the same age range⁽²³⁾, Which all comes in agreement with our study results. This finding

may be because autoimmune diseases are more common among females.

As the age advances, the incidence of thyroid disorder increases. But in the current study thyroid disorders were more in the age group between 60-65 which may be attributed to the large number of study subjects in this age group.

As regards Clinical features of hypothyroidism among subjects, generalized weakness and easy fatigability were the most common symptoms in both overt and subclinical cases and sluggish ankle jerk was the most common sign detected.

A prospective study by *Doucet et al* ⁽²⁴⁾ compared 24 clinical symptoms and signs of hypothyroidism between older (mean age=79.3 years) and younger patients (mean age=40.8 years), fatigue and weakness were the most common symptoms in older adults, while cold intolerance, weight gain were less common.

The classic symptoms of thyroid dysfunction are usually absent or may not be so obvious in elderly so, a high degree of clinical suspicion is necessary. ⁽²⁵⁾

As per our study results, one out of 10 overt hypothyroid cases scored MMSE<24. Studies reported that hypothyroidism in older adults has been associated with impairment of several cognitive domains including memory, attention and concentration, language, executive function and perceptual and visuo-spatial function ^(26,27). However, several studies in older adults did not show a significant association between subclinical hypothyroidism and reduced cognitive performance ^(28,29).

As regards hyperthyroidism, palpitation, tachycardia and weight loss were the most common Clinical features among subjects. The paucity of clinical signs of hyperthyroidism in older adults has been confirmed by several studies ^(30,31) with weight loss, apathy and tachycardia the most commonly occurring symptoms.

A large cross-sectional study by *Boelaert et al* showed an increased prevalence of weight loss in older patients with hyperthyroidism. This study also demonstrated a higher proportion of older

adults reporting only one or two symptoms, versus five or more in the younger patients ⁽³²⁾. The absence of classical symptoms and signs in older adults presents a diagnostic challenge ⁽³¹⁾. It is also reported that atrial fibrillation was present in up to 20–35% of older patients suffering from hyperthyroidism ^(31,33,34).

Loss of interest was observed in 2 cases with clinical hypothyroidism and 1 case with clinical hyperthyroidism in the current study which support several Studies reporting that both hypo- and hyperthyroidism can cause symptoms consistent with depression ^(35,36).

Conclusion

We can conclude through the present study results that thyroid disorder is a common problem in elderly and a high index of suspicion of thyroid dysfunction in the elderly is needed because of the paucity of symptoms and difficult interpretation of thyroid function tests due to age dependent physiologic changes in thyroid function, coexistent chronic illness, and poly pharmacy.

Study limitations

Our study has limitations. Importantly, this was a small single centered observational study and did not extend to cover all areas in Qatif city, also regarding the clinical features of thyroid disorders, loss of interest is clinical feature for depression and also for apathy, so further assessment should have been done using different scales for depression and apathy.

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