



ORIGINAL RESEARCH PAPER

Medicine

THYROID DISORDERS IN THE ELDERLY

KEY WORDS:

Hypothyroidism, Hyperthyroidism, Subclinical Hypothyroidism, Thyroid disorders in elderly.

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ABSTRACT

Background: The prevalence of thyroid disorders in India's elderly population is less documented. **Methods:** The study included all subjects under the age of 60 who had estimation of thyroid function tests (TFTs) performed on their first hospital visit between 2021 and 2022. **Results:** A sum of 1479 subjects (guys 671, females-808), matured between 60-94 (Mean 69.02 SD: 7.21) years, were looked at. 13.99% of subjects had thyroid problems. Females had a higher prevalence rate of thyroid disorders (14.73%) than males did (13.11%), and those under the age of 70 had a higher prevalence rate (14.74%) than those between the ages of 60 and 69 (13.57%). Subclinical hypothyroidism (SCH) was found in 5.54 percent of subjects, while overt hypothyroidism (OH) was found in 5.81 percent. Greater part (90.69%) of cases Gracious were of essential hypothyroidism. Subclinical hyperthyroidism (SH) was present in 0.88 percent of subjects, while hyperthyroidism was present in 1.76 percent. Males had a higher prevalence of all disorders than females did; SCH and SH were prevalent in the 60- to 69-year-old age group, and OH and hyperthyroidism were common in those under 70. **Conclusions:** Thyroid problems are common in older people; affecting almost 14% of the people in the study. With prevalence rates of 5.81, 5.54, 1.76, and 0.88 percent, respectively, all types were more common in females than in males. The OH and hyperthyroidism showed a rising pattern with age; both in males and females.

INTRODUCTION:

Thyroid disorders are one of the most prevalent endocrine conditions worldwide; However, there is insufficient information regarding their prevalence in India. As with adults, the etiologic factors for thyroid disorders in the elderly include autoimmunity, medications, surgery, and radiotherapy.[1,2] Besides the aforementioned variables, with age, the thyroid undergoes numerous changes, which contribute to an increase in the prevalence of thyroid disorders in the elderly.[3,4]

The autoimmunity process has been shown to worsen with age; Anti TPO titres are more common in females than in males.[5] The manner in which elderly patients present varies greatly, and unlike young patients, most are asymptomatic. [6, 7, and 8] There are a variety of reported rates of thyroid disorders in elderly people; from up to 8.9 percent in a community study in the United States[9], 20.4 percent in Norway[10], and the majority (73 percent) of the elderly (>60 years) who are sick and hospitalized with abnormal thyroid parameters[11]. There is limited data regarding thyroid disorders in the elderly from India, with reported prevalence rates of 13.11 percent for hypothyroidism and 8.9 percent for subclinical hypothyroidism in one study [12] and 25 percent (all thyroid disorders) in another report [13] The purpose of this study was to estimate the prevalence of thyroid disorders in elderly in patients attending Government general hospital, Vijayawada under the age of 60.

MATERIALS AND METHODS

Study design and subjects

This study is conducted at Government General Hospital, Vijayawada. This included all subjects under the age of 60 who had estimation of thyroid function tests (TFTs) performed on their first outpatient visit between January 2021 to

December 2022. For the purpose of analysis, the participants were divided into two groups based on age (60-69 and 70 years) and gender. The study's objectives were to estimate the prevalence of thyroid disorders by classifying them according to the TFTs into various categories.

Estimation, diagnosis, and statistics from thyroid function tests:

Electrochemiluminescence assay (Cobas-Roche ElecsysCore immunoassay system – Roche Diagnostics, Mannheim, GmbH) was used to analyze thyroid stimulating hormone (TSH), triiodothyronine (T3), and TSH. The normal ranges for T4, T3, and TSH were, respectively, 5.1-14.1 mcg/dL, 60-180 ng/dL, and 0.35-5.5 IU/mL. For all three parameters, the intra assay and inter assay coefficient of variation (CV) was less than 7%.

The local population's normal range was not specified; As a result, TFTs were considered abnormal if their values exceeded the TFT kit's normal range.

In our study, the following definitions were used to classify the subjects:

Hypothyroidism primary: Subclinical hypothyroidism: TSH greater than 5.5 IU/mL and T4 5.1 mcg/dL or T3 less than 60 ng/dL. TSH greater than 5.50 IU/mL and normal T4 and T3
Hypothyroidism after the fact: T4 5.1 g/dL or T3 60 ng/dL, as well as an inappropriately elevated TSH level.

Hyperthyroidism: Subclinical hyperthyroidism: TSH 0.35 IU/mL, T3 180 ng/dL, and T4 14.1 mcg/dL. TSH < 0.35 IU/mL Also, normal T3, ordinary T4.

Hyperthyroidism added on: T3 >180 ng/dL or T4 >14.1 mcg/dL, as well as an inappropriately suppressed TSH level. Mean standard deviation and range have been used to describe the quantitative variables (age, TSH, T3, and T4). The pervasiveness of hypothyroidism and other thyroid problems was summarised as counts and rates. The trends in the prevalence of hypothyroidism, SCH, and hyperthyroidism among various age groups and gender categories were evaluated using the Chi-square test. A p value of less than 0.05 was considered significant.

OBSERVATIONS:

The study included 1479 subjects (males: 671; females: 808) between the ages of 60 and 94 who underwent TFT estimation from January 2021 to December 2022 [Table 1]. The greater part (85%) of the review populace was purportedly consuming iodized salt. Table 1 provides a summary of the age, TSH, T3, and T4 range, mean, and standard deviations by age group.

Table 2 shows that 13.99 percent of subjects had thyroid function abnormalities. Females had a higher prevalence rate of thyroid function abnormalities (14.73 percent) than males did (13.11 percent). Subjects under 70 years old had thyroid function abnormalities at a higher rate (14.74 percent) than those between 60 and 69 years old (13.57 percent). [Table 3]. Overt Hypothyroidism.

The most common thyroid function abnormality was overt hypothyroidism (OH), accounting for 5.81 percent (n=86) of all cases. With prevalence rates that are statistically insignificant, with male prevalence rates slightly higher than female prevalence rates (5.69% n=46) (n=40). The majority of OH cases (90.69 percent, or 78 out of 86) were caused by primary hypothyroidism [Table 2]. The statistically insignificant (p=0.13) prevalence rate of hypothyroidism was higher among those under the age of 70 (7.55%) than among those between the ages of 60 and 69 (4.84%). In both age groups, there was also no significant difference in prevalence rates between males and females [Table 4, 5].

Subclinical hypothyroidism:

The second most common thyroid function abnormality was subclinical hypothyroidism (SCH); 5.54 percent (n=82) of subjects were affected; Statistically insignificant, affecting women 5.57 percent more than men 5.51 percent [Table 2]. According to Table 3, the statistically significant prevalence rate of SCH was higher among those aged 60-69 years (6%) than among those under 70 years (4.72%). In both age groups, there was no statistically significant difference in the prevalence rates of SCH based on gender [Tables 4 and 5].

Hyperthyroidism:

The third most common thyroid condition was hyperthyroidism; was observed in 1.76 percent of subjects (n=26) [Table 2]. Females have a higher prevalence rate of hyperthyroidism (2.22%) than males do (1.19%); However, it did not matter statistically. According to Table 3, the prevalence of hyperthyroidism was higher among people under the age of 70 (2.08%) than among those between the ages of 60 and 69 (1.58%). But it didn't matter statistically. Females were more affected than males in both of the above age groups [Tables 4 and 5]; However, there was no statistically significant difference.

Subclinical Hyperthyroidism:

The fourth most common thyroid condition was subclinical hyperthyroidism (SH); was observed in n=13 subjects (0.88%) [Table 2]. Females had a prevalence rate of subclinical hyperthyroidism that was 1.24 percent higher than males' (0.45 percent) [Table 2].

But was unimportant statistically. According to Table 3, the prevalence of hyperthyroidism was higher among those

between the ages of 60 and 69 (0.84%) than among those under 70 (0.38%); However, it lacked statistical significance. Females were more affected than males in both of the above age groups [Tables 4 and 5]; However, there was no statistically significant difference.

Table 1: Descriptive data of T3, T4, and TSH levels according to gender

Parameter	Gender		
	All subjects (n = 1479) Mean ±SD & Range	Males (n = 671) Mean ±SD & Range	Females (n = 808) Mean ±SD & Range
Age	69.02 ± 7.21	68.75 ± 6.91	69.25 ± 7.45
	60-94	60-92	60-94
	98.51 ± 36.06	98.49 ± 32.16	98.53 ± 39.02
T3 ng/dL	35.32 – 409.6	7.49 – 409.6	19.53-651
	8.40 ± 2.53	8.09 ± 2.28	8.65 ± 2.69
T4 µg/dL	0.43 – 24.86	0.56- 20.63	0.43-24.86
	3.69 ± 9.36	3.84 ± 9.08	3.57 ± 9.59
TSH µIU/mL	0.005 – 100	0.005 – 100	0.005-100

Table 2: Prevalence rate of thyroid dysfunction in elderly and its variation according to gender

Parameter	Gender			Chi square test (prevalence in)
	All Subjects (1479) n (%)	Males (671) n (%)	Females (808) n (%)	
Hypothyroidism (primary)	78 (5.27)	37 (5.51)	41 (5.07)	0.70
Hypothyroidism (secondary)	8 (0.54)	3 (0.45)	5 (0.62)	0.65
Subclinical Hypothyroidism	82 (5.54)	37 (5.51)	45 (5.57)	0.96
Hyperthyroidism (primary)	26 (1.76)	8 (1.19)	18 (2.22)	0.13
Hyperthyroidism (secondary)	0	0	0	
Subclinical Hyperthyroidism	13 (0.88)	3 (0.45)	10 (1.24)	0.10
Total subjects with thyroid dysfunction	207 (13.99)	88 (13.11)	119 (14.73)	0.37

Table 3: Prevalence rate of thyroid dysfunction and its variation according to age

Parameter	Age groups (Years)			Chi square test (prevalence in males vs females) p value
	All subjects (1479) n (%)	60-70 (950) n (%)	≥ 71 (529) n (%)	
Hypothyroidism (primary)	78 (5.27)	42 (4.42)	36 (6.8)	0.91
Hypothyroidism (secondary)	8 (0.54)	4 (0.42)	4 (0.75)	0.37
Subclinical Hypothyroidism	82 (5.54)	57 (6.0)	25 (4.72)	0.03
Hyperthyroidism (primary)	26 (1.76)	15 (1.58)	11 (2.08)	0.65
Hyperthyroidism (secondary)	0	0	0	

Subclinical Hyperthyroidism	13 (0.88)	11 (0.84)	2 (0.38)	0.12
Total subjects with thyroid dysfunction	207 (13.99)	129 (13.57)	78 (14.74)	0.53

Table 4: Prevalence rate of thyroid dysfunction in according to gender in age group of 60-70 years

Parameter	Age group of 60-70 Years			Chi square test (prevalence in males vs females) p value
	All subjects (950) n (%)	Males (446) n (%)	Females (504) n (%)	
Hypothyroidism (primary)	42 (4.42)	20 (4.48)	22 (4.36)	0.78
Hypothyroidism (secondary)	4 (0.42)	2 (0.45)	2 (0.39)	0.98
Subclinical Hypothyroidism	57 (6.0)	26 (5.83)	31 (6.15)	0.44
Hyperthyroidism (primary)	15 (1.58)	4 (0.90)	11 (2.18)	0.06
Hyperthyroidism (secondary)	0	0	0	
Subclinical Hyperthyroidism	11 (0.84)	3 (0.67)	8 (1.59)	0.49
Total subjects with thyroid dysfunction	129 (13.57)	55 (12.33)	74 (15.47)	0.11

Table 5: Prevalence rate of thyroid dysfunction in according to gender in age group of ≥ 71 years

Parameter	Age group of ≥ 80 Years			Chi square test (Males vs Females)
	All subjects (529) n (%)	Males (225) n (%)	Females (304) n (%)	
Hypothyroidism (primary)	36 (6.8)	17 (7.55)	19 (6.25)	0.55
Hypothyroidism (secondary)	4 (0.75)	1 (0.44)	3 (0.98)	0.47
Subclinical Hypothyroidism	25 (4.72)	11 (4.88)	14 (4.60)	0.87
Hyperthyroidism (primary)	11 (2.08)	4 (1.77)	7 (2.30)	0.67
Hyperthyroidism (secondary)	0	0	0	
Subclinical Hyperthyroidism	2 (0.38)	0	2 (0.65)	0.22
Total subjects with thyroid dysfunction	78 (14.74)	33 (14.66)	45 (14.80)	0.96

DISCUSSION:

Thyroid function abnormalities were found in 13.99 percent of subjects aged 60 years, with the majority (85 percent) consuming iodized salt. Thyroid function abnormalities were

more common in females and in subjects younger than 70 years old, according to our study's prevalence rates [12, 13]. The ascent in thyroid issues with age and higher paces of predominance rates in females than guys are likewise steady With prior reports [10, 12, and 13] The OH accounted for 5.81 percent of the thyroid function abnormalities; with almost the same tendency to affect both males and females than males.

Those under the age of 70 had a higher prevalence rate of OH than those between the ages of 60 and 69, and there was no difference in prevalence rates between men and women in either age group. The majority of OH cases (90.69 percent) were caused by primary hypothyroidism.

Since OH is the most prevalent thyroid condition, the study's prevalence rates are in line with previous findings[6, 9, 12, 13, 14]. The second most common thyroid function abnormality was the SCH, with 5.54 percent of cases. Primarily affecting women rather than men; However, there was no statistically significant difference. Those between the ages of 60 and 69 had a significantly higher prevalence rate of SCH than those under 70. The reported predominance paces of SCH fluctuate from 8.9 to 9.0 from India [12,13] and 4.8 to 7.0 % from abroad [10],more in females than guys.1.76 percent of subjects had hyperthyroidism; More common in women than in men. Those between the ages of 60 and 69 had a lower prevalence rate of hyperthyroidism than those under 70. The reported elderly prevalence rates of hyperthyroidism range from 0.5 to 3 percent worldwide [6, 9, 10] and up to 2 percent in India [13]; a result that is in line with our research.

0.88% of subjects saw the SH; higher among females than males, in line with previous studies[6, 10, 12]. The prevalence of hyperthyroidism was higher among those aged 60-69 years (0.84 percent) than among those under 70 years; In both age groups, females were more affected than males. Due to the low number of subjects included in the study, one of the studies reported a prevalence of 3% of the total population. [13] To sum up, this study is the first of its kind to look at the prevalence of thyroid disorders in children and adolescents, most of whom consume iodized salt.

Limitations:

There are few limitations to our study; First, the sample size of the study was relatively small; need a lot of large, multicenter trials with older age groups; to determine a national prevalence estimate. Second, because there were no reference values for the study population, the classification was based on the recommendations made by the kit manufacturer regarding the normal values of TFTs.

CONCLUSIONS:

The present study was the first of its kind to look at how common thyroid function problems are in elderly people from Vijayawada.

In the elderly, thyroid function disorders are common; Affecting roughly 14% of the population under study. Due to differences in symptomatology (the majority of the elderly are asymptomatic in comparison to young people), elective screening is recommended for suspecting subjects.

The most common thyroid disorder was overt hypothyroidism (5.81 percent), followed by SCH (5.54 percent), hyperthyroidism (1.76 percent), and subclinical hyperthyroidism (0.88%). Primary hypothyroidism accounted for the majority of OH cases. Abnormalities in thyroid function were more prevalent in females than in males. Alterations in thyroid function tend to worsen with age in both men and women.

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