



## A STUDY OF THYROID DYSFUNCTION AMONG ELDERLY IN A TERTIARY CARE CENTRE IN BANGALORE, SOUTH INDIA.

### Endocrinology

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### ABSTRACT

**Background:** The thyroid function disorders are one of the commonest endocrine disorders in the world, elderly being one of the most vulnerable groups of patients affected. A recent report shows that 300 million people in the world are suffering from thyroid disorders and among them, about 42 million people reside in India.<sup>1</sup> The etiologic factors for thyroid disorders in elderly are multiple in addition to numerous changes occur in thyroid with age, contributing to raise in prevalence of thyroid disorders in elderly and their diagnosis is not easy as only one third patients show typical signs and symptoms which many a times are attributed to ageing process.<sup>2,3</sup> The objectives of this study were to assess the prevalence of thyroid dysfunction in elderly population aged >60yrs, to correlate clinical profile with biochemical thyroid dysfunction and to study prevalence of dyslipidaemia in patients with dysfunction. **Methodology:** Cross sectional study involving total of 130 participants who visited Medicine/Geriatric OPD patients of age >60 years are selected by convenient sampling. Clinical and biochemical data were documented in the data reporting form. Duration of study was 2years (September 2017 – September 2019). Descriptive statistics reported as mean and SD for the continuous variables, number and percentages for the categorical variables. The proportion of thyroid dysfunction reported using percentages. Association with clinical parameters done using chi-square test or independent t-test as appropriate. A p-value less than 0.05 considered as statistically significant. **Results:** A total of 130 patients were studied, mean age of study subjects were 76.81 ± 9.072years. The thyroid function abnormalities were found in 19.3 % of 130 patients. Of the 19.3% of subjects - 3.1% were hyperthyroid, 3.1% were sub-clinical hypothyroid and 13.1% were hypothyroidism. The prevalence rate of thyroid function abnormalities was more in females. (F-19.64% and M-18.9%). (p- 0.539). Patient with thyroid dysfunction were more in urban (53.1%) than rural.(49.1%) (p-0.043). Commonest comorbidities noted in study population was dyslipidaemia followed by hypertension. Commonest symptoms noted are generalised weakness (p-<0.001) and dry skin as commonest sign. Dyslipidaemia (Total cholesterol (p -0.008) and triglycerides(p-0.015) )significantly more in study population with thyroid dysfunction in comparison with group with normal thyroid functions. **Conclusions:** This study shows prevalence of 19% for thyroid disorders in the elderly and it often presents with vague and non-specific symptoms. It showed overt hypothyroidism as the common variety of thyroid dysfunction in elderly, and more common in females than males. The finding that a large number of elderly patients unknowingly have laboratory evidence of thyroid dysfunction with few or minimal symptoms and the fact that it can mimic many other clinical and psychiatric conditions supports the usefulness of screening of thyroid function as part of routine investigations after age of 60 years, for early detection and treatment to reduce the ill effects of thyroid dysfunction.

### KEYWORDS

#### INTRODUCTION

The thyroid function disorders are one of the commonest endocrine disorders in the world. A recent report shows that 300 million people in the world are suffering from thyroid disorders and among them, about 42 million people reside in India.<sup>1</sup> The wide spectrum of thyroid disorders includes hypothyroidism, hyperthyroidism, goitre, thyroid nodules, and thyroid cancer.<sup>4</sup> Thyroid abnormalities are classified into the following groups based on clinical features and thyroid function tests. The etiologic factors for thyroid disorders in the elderly are multiple as in adults (autoimmunity, drugs, surgery, and radiotherapy). In addition to the above factors, numerous changes occur in thyroid with age, contributing to a rise in the prevalence of thyroid disorders in the elderly. The ageing was shown to increase the process of autoimmunity; anti-TPO titres in females more than in males. The mode of presentation varies widely in the elderly, most are asymptomatic, unlike young patients. People over the age of 65 accounted for 35.9 million (12.3%) of the total U.S. population in 2003, and their numbers are projected to increase to 71.5 million by 2030. Likewise, in India, the geriatric population which is 60 years and above is estimated to be 103.9 million of 1.21 billion according to the Ministry of Statistics and Programme Implementation, Government of India.<sup>5</sup> There is limited data regarding thyroid disorders in elderly from India with reported prevalence rates of 13.11% for hypothyroidism and 8.9 % for subclinical hypothyroidism in one study and 25 % (all thyroid disorders) in another report.

Epidemiological studies have shown a possible association between subclinical and overt thyroid disorder and cardiovascular disease. Literature shows a high possibility of cardiac dysfunction or an adverse cardiac end-point (including atherosclerotic disease and cardiovascular mortality), the elevation of total and low-density lipoprotein cholesterol and neuropsychiatric symptoms in thyroid disorders.<sup>7</sup> It has also been shown to increase morbidity and mortality in elders. Three different clinical conditions – hypothyroidism,

depression, and presence of anaemia share common and nonspecific symptoms and each of these are common in older people. The 'American Thyroid Association' recommends thyroid screening for men and women at 35years of age and thereafter every 5 years.

#### MATERIALS AND METHODS

Cross sectional study involving total of 130 participants who visited Medicine/Geriatric OPD patients of age >60 years are selected by convenient sampling. Clinical and biochemical data documented in the data reporting form. Duration of study was 2 years (September 2017 – September 2019). All patients of age >60 years attending Medicine /Geriatric OPD were included. All patients who were acutely sick, with established thyroid disorders on thyroid supplements, patients on drugs known to alter the thyroid functions, patients who have undergone thyroid surgery or taken radioactive iodine therapy or on iodine-containing vitamins or minerals and lastly patients evaluated with radiological tests using contrast media in the recent past were excluded. Total of 130 participants who visited Medicine/Geriatric OPD patients of age >60 years are selected at random and history, associated comorbidities, general clinical examination of the patient along with the laboratory evaluation of thyroid profile with complete blood counts, peripheral smear, random blood sugars, Lipid profile, ECG was done. Clinical and biochemical data documented in the data reporting form. Patients collected data were classified and analysed based on Gender, sex, demographic background, anaemia, associated comorbidities with thyroid status - Euthyroid, Hypothyroid, Subclinical hypothyroid and Hyperthyroid. The institutional ethics committee approval for the study was obtained on 28th November 2017.

#### Statistical Methods:

Descriptive statistics reported as mean and SD for the continuous variables, number and percentages for the categorical variables , proportion of thyroid dysfunction reported using percentages and association with clinical parameters done using chi-square test or

independent t-test as appropriate. A p-value less than 0.05 considered as statistically significant. Data was entered in MS excel. The analysis was carried out using SPSS version 24.

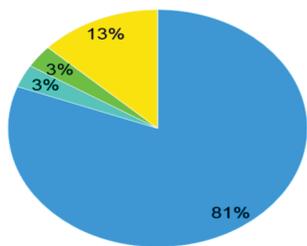
**Sample size estimation**

As per literature review, the study by Lakshminarayana et al reported that the prevalence of thyroid dysfunction among elderly aged >60 years as ~14%. The sample size required to observe the patches with 6% absolute precision and 95% CI the sample size required is 130.

**RESULTS**

The total number of participants in the study were 130. Minimum age of the participants was 60 years and maximum age of participants was 97 years with Mean age of 76.81 ± 9.072 (TABLE 1). Males constituted 56.9% of study participants and females constituted 43.1%. This study a prevalence of thyroid dysfunction of about 19.3% in study population compared to 13.9% in a recent study done in Kerala.<sup>8</sup> Among people with thyroid dysfunction, 3.1% were hyperthyroid, 3.1% had subclinical hypothyroidism and 13.1% had hypothyroidism. In a similar study conducted in Rajasthan, the prevalence of hyperthyroidism, euthyroidism, and hypothyroidism according to age was 5.9%, 80.9%, and 13.2%.<sup>9</sup> The study showed that thyroid dysfunction is maximum in the 60-69 years group with prevalence being more in women and least being in the 90-99 years age group. The most common co-morbidity noticed in the study population is dyslipidemia followed by hypertension and coronary artery disease, and the least common being cerebrovascular accident and obesity (TABLE 2). The most common symptom in patients with thyroid dysfunction is generalised weakness and the least common symptoms are weight loss, sweating, heat intolerance and irritability (TABLE 3). The most commonest sign is dry skin seen in almost all cases of hypothyroidism (TABLE 4). Lipid abnormalities were also found to be more in patients with thyroid dysfunction. Total cholesterol and triglycerides are found to be significantly higher in a group with thyroid dysfunction in comparison with a group that was normal thyroid function.

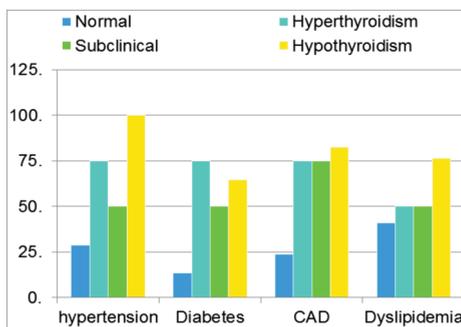
■ Normal ■ Hypothyroidism  
■ Subclinical hypothyroidism ■ Hypothyroidism



**Age and thyroid dysfunction**

AGE	N(Total no of patients)	%	Thyroid dysfunction (n)	%
60-69years	28	21.53%	9	36%
70-79years	50	38.46%	7	28%
80-89years	41	31.53%	5	20%
90-99years	11	8.46%	4	16%

TABLE 1: Age distribution with total percentage of patients and percentage with thyroid dysfunction



**Co-morbidities and thyroid dysfunction**

Comorbidity	Hyperthyroidism	Hypothyroidism	Subclinical Hypothyroidism	Normal	P-value
Hypertension	75%	100%	50%	28.60%	<0.001

DIABETES	75%	64.70%	50%	13.30%	<0.001
CAD	75%	82.40%	75%	23.80%	<0.001
OBESITY	0%	47.14%	0%	0%	<0.001
DYSLIPIDEMIA	50%	76.50%	50%	41%	0.058
CEREBROVASCULAR	0%	47.10%	25%	1.90%	<0.001

TABLE 4: Co-morbidities and thyroid dysfunction

**Symptoms of thyroid dysfunction**

SYMPTOMS	Hyperthyroidism	Hypothyroidism	Subclinical Hy/pothyroidism	Normal	P-value
Weakness	0%	100%	75%	41.90%	<0.001
Dry skin	0%	82.40%	25%	17.10%	<0.001
Cold	0%	23.50%	25%	1%	<0.001
Hair loss	0%	47.10%	50%	3.80%	<0.001
Poor memory	0%	82.40%	50%	2.90%	<0.001
Lack of concentration	0%	17.60%	25%	5.70%	0.174
Constipation	0%	76.50%	0%	3.80%	<0.001
Weight gain	0%	29.40%	50%	1.90%	<0.001
Hoarse voice	0%	47.10%	50%	0%	<0.001
Paraesthesia	0%	23.50%	0%	13.30%	0.45
Impaired hearing	100%	23.50%	0%	2.90%	<0.001
Irritability	50%	0%	0%	0%	<0.001
Palpitation	75%	29.40%	25%	1%	<0.001
Heat intolerance	50%	0%	0%	0%	
Sweating	50%	0%	0%	0%	
Weight loss	25%	11.80%	0%	0%	<0.001
Diarrhoea	50%	0%	0%	3.80%	<0.001
Polyuria	50%	23.50%	0%	1%	<0.001
Dyspnoea	0%	0%	0%	3.80%	0.805
Menstrual abnormalities	0%	0%	0%	0%	

TABLE 5: Symptoms of thyroid dysfunction

**Signs of thyroid dysfunction**

SIGNS	Hyperthyroidism	Hypothyroidism	Subclinical Hypothyroidism	Normal	P value
Dry skin	0%	100%	0%	4.80%	<0.001
Puffiness	0%	64.70%	0%	0%	<0.001
Diffuse alopecia	0%	58.80%	0%	10.50%	<0.001
Bradycardia	0%	29.40%	0%	1%	<0.001
Peripheral edema	50%	47.10%	50%	6.70%	<0.001
Delayed DTR	0%	76.50%	0%	1%	<0.001
CTS	0%	0%	0%	0%	-
Serous cavernous effusions	0%	17.60%	0%	1%	<0.001
Tachycardia	100%	0%	0%	2.90%	<0.001
Atrial fibrillation	50%	0%	25%	1%	<0.001
Tremors	75%	0%	0%	14.30%	<0.001
Goitre	50%	17.60%	25%	2.90%	<0.001
Warm moist skin	50%	0%	25%	2.90%	<0.001
Proximal myopathy	50%	5.90%	25%	12.40%	0.106
Eye signs	0%	0%	0%	1%	0.971
Gynecomastia	0%	0%	0%	0%	

TABLE 6: Signs of thyroid dysfunction

**CONCLUSION**

In elderly patients, thyroid dysfunction is not uncommon. One-fifth of the patients exhibited thyroid function abnormalities. Thyroid abnormalities were more in females than males. Hypothyroidism is more common than hyperthyroidism in elderly patients. It can be concluded that elderly patients who present with nonspecific and vague symptoms like fatigue, weakness, lethargy, and disinterest in

daily activities must be taken as a strong suspicion of thyroid disorders and need to evaluate them for thyroid disorders. Also, Lipid abnormalities in patients with thyroid abnormalities are more predominant than with normal individuals of the same age.

The finding that a large number of elderly patients unknowingly have laboratory evidence of thyroid dysfunction with few or minimal symptoms and the fact that it can mimic many other clinical and psychiatric conditions supports the usefulness of screening of thyroid function as part of routine investigations after age of 60 years, for early detection and treatment to reduce the ill effects of thyroid dysfunction.

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