

Original research article

Study on subclinical hypothyroidism in elderly patients at a tertiary care hospital

Dr.Chakrapani Prabhakar Raju

Associate Professor, Department of General Medicine, Katuri Medical College & Hospital, Guntur, Andhra Pradesh.

Corresponding author*



ABSTRACT

Introduction: Abnormal thyroid function has important ramifications on health outcomes pertinent to older adults, including cardiovascular arrhythmia, metabolism, bone health, and mental health. The clinical manifestations may be less obvious in the setting of somatic complaints and other conditions related to ageing.

Material & Methods: It was a Hospital based cross sectional study done at a tertiary care hospital, Guntur. Study period was from September 2018 to August 2019. A total of 120 patients aged more than 60 years attending outpatient clinic were selected using convenient sampling technique from the outpatient clinic. The laboratory examinations included estimation of Total cholesterol, High Density Lipoprotein (HDL), Triglycerides (TG) and Thyroid stimulating hormone (TSH) & free thyroxine (FT4).

Results: The overall prevalence of subclinical hypothyroidism in the study population was found to be 15.8% which was seen in 19 patients out of 120 study subjects. Out of 19 patients with subclinical hypothyroidism, 14 were females and rest 5 were males. Majority (20.8%) acknowledged that they had no symptoms. Among 120 subjects studied, 38 (31.7%) had no co morbidity. 51 (42.5%) had Coronary artery disease, 40 (33.3%) had hypertension and 37 (30.8%) had diabetes mellitus. Among the 51 subjects who had Coronary artery disease, 36 (70.6%) did not have subclinical hypothyroidism and 15 (29.4%) had subclinical hypothyroidism.

Conclusions: The thyroid disease should be considered during routine evaluation of this susceptible group and should be followed by appropriate detection and treatment. Further research may determine whether treatment of subclinical hypothyroidism will benefit in preventing adverse health outcomes.

Keywords: hypothyroidism, sub clinical, elderly

INTRODUCTION

People worldwide are living longer. Today, for the first time in history, most people can expect to live into their sixties and beyond. By 2050, the world's population aged 60 years and older is expected to total 2 billion, up from 900 million in 2015. Today, 125 million people are aged 80 years or older. By 2050, there will be almost this many (120 million) living in China alone, and 434 million people in this age group worldwide. By 2050, 80% of all older people will live in low- and middle-income countries.^[1]

Common health conditions in older age include hearing loss, cataracts and refractive errors, back and neck pain and osteoarthritis, chronic obstructive pulmonary disease, diabetes, depression, and dementia. Furthermore, as people age, they are more likely to experience several conditions at the same time. Older age is also characterized by the emergence of several complex health states that tend to occur only later in life and that do not fall into discrete disease categories. These are commonly called geriatric syndromes. They are often the consequence of multiple underlying factors and include frailty, urinary incontinence, falls, delirium and pressure ulcers.^[2]

Subclinical thyroid disease is defined as elevated or depressed serum thyrotropin (TSH) level with a normal serum-free thyroxine (T4) level.^[3] The prevalence of thyroid dysfunction varies by age, sex, race/ethnicity, and geographically through variations in dietary iodine intake. Abnormal thyroid function has important ramifications on health outcomes pertinent to older adults, including cardiovascular arrhythmia, metabolism, bone health, and mental health. The clinical manifestations may be less obvious in the setting of somatic complaints and other conditions related to ageing. More often it is diagnosed biochemically on evaluation for other co-morbid illnesses rather than clinically.^[4,5,6]

Objective of the study was to estimate the prevalence of subclinical hypothyroidism in elderly patients attending Geriatric Outpatient Department at a Tertiary care centre, Guntur.

MATERIAL & METHODS:

It was a Hospital based cross sectional study done at a tertiary care hospital, Guntur. Study period was from September 2018 to August 2019. A total of 120 patients were selected using convenient sampling technique from the outpatient clinic.

Study population

Inclusion criteria: All patients aged more than 60 years attending outpatient clinic during the above mentioned study period.

Exclusion criteria:

1. Patients with recent surgery, recent myocardial infarction and with recent acute illness followed by hospitalisation in the past 6 months.
2. Patient who were already diagnosed to have any thyroid dysfunction (hypo and hyperthyroidism) or received radiotherapy over head and neck for any cause.

All the study subjects were interviewed and the medical history was obtained. The patients were explained of the methods and objectives of the study and an informed consent was obtained from them. A brief general examination including height and weight measurement was carried out as per the particulars mentioned in the proforma. Blood pressure was measured twice in the sitting position on the right arm, using standard mercury sphygmomanometer to the nearest 2 mm of mercury. With regards to co morbidities, patients with only documented evidence of the co-morbidities like Diabetes Mellitus (DM), Systemic Hypertension (SHT), Peripheral Vascular Disease (PVD) and Cerebrovascular Accident (CVA) were taken into consideration. CAD was documented if the person had prior coronary revascularization, coronary angiographic evidence of significant CAD, a documented history of myocardial infarction, electrocardiographic evidence of Q-wave myocardial infarction, or on treatment for CAD documented by cardiology department. All electrocardiograms were reviewed for evidence of myocardial infarction.

The patients were asked to come to the outpatient clinic on the next day morning with overnight fasting and around 5 ml of venous blood samples drawn were used for biochemical laboratory analysis. The laboratory examinations included estimation of Total cholesterol, High Density Lipoprotein (HDL), Triglycerides (TG) and Thyroid stimulating hormone (TSH) & free thyroxine (FT4).

Subclinical hypothyroidism: Subclinical hypothyroidism was diagnosed if the serum TSH level was elevated and the serum T4 level was in the normal range.

Statistical analysis: The data was tabulated and analysed. The quantitative data was summarized in excel sheet. Mean & standard deviation were estimated. Microsoft word and excel was used for preparation of graphs and charts.

OBSERVATION AND RESULTS:

The overall prevalence of subclinical hypothyroidism in the study population was found to be 15.8% which was seen in 19 patients out of 120 study subjects. Of the 3 different age groups studied (60-69 years, 70-79 years, 80+), subclinical hypothyroidism was found in 4,7,8 patients in respective age groups. With regards to sex distribution, female preponderance was seen. Out of 19 patients with subclinical hypothyroidism, 14 were females and rest 5 were males.

Study population were asked about the symptoms that they were experiencing wherein majority (20.8%) acknowledged that they had no symptoms.

Among 120 subjects studied, 38 (31.7%) had no co morbidity. 51 (42.5%) had Coronary artery disease, 40 (33.3%) had hypertension and 37 (30.8%) had diabetes mellitus.

Among the 120 subjects studied, 69 (57.5%) did not have Coronary artery disease (CAD) and 51 (42.5%) had Coronary artery disease. Among the 51 subjects who had Coronary artery disease, 36 (70.6%) did not have subclinical hypothyroidism and 15 (29.4%) had subclinical hypothyroidism.

Lipid profile of the study population showed that, 95 (79.2%) did not have dyslipidaemia and 25 (20.8%) had dyslipidaemia. Among 25 cases of dyslipidaemia, 15 (60%) had subclinical hypothyroidism and rest 10 cases did not subclinical hypothyroidism.

Table 1: Demographic characteristics & Co morbidities among the study population

Characteristic	Subclinical Hypothyroidism	
	Yes (n=19)	No (n=101)
Age		
60-69	04	33
70-79	07	35
80-89	08	33
Sex		
Male	05	46
Female	14	55
Symptoms		
Yes	09	16
No	10	85

Coronary artery disease (CAD)		
Yes	15	36
No	04	65
Hypertension		
Yes	10	30
No	09	71
Diabetes mellitus		
Yes	12	25
No	07	76
Dyslipidaemia		
Yes	15	10
No	10	85

DISCUSSION

Hypothyroidism, overt or subclinical, is a very frequent chronic disease among the older population; however, TSH circulating levels have been demonstrated to increase with aging, regardless the existence of an actual thyroid disease. For this reason, when confronting an increase in TSH circulating level in a patient older than 60 years of age, and even more carefully in the oldest old, it is important to carry an appropriate diagnostic path, comprehensive of clinical picture, laboratory tests, in particular checking for anti-thyroid autoantibodies, and US scan.^[7] Present study which has been conducted with main objective of estimating the prevalence of subclinical hypothyroidism in elderly patients showed a high prevalence of subclinical hypothyroidism with comorbidities being observed such as coronary artery disease (CAD), hypertension, diabetes and hyperlipidaemia. Similar findings were observed in study by Sundeep Nutakki et al where the prevalence of subclinical hypothyroidism is considerably high in this study (16.7%). The prevalence increased as the age advanced and the prevalence was more in females than in males.^[8]

The prevalence of 5.9% to 35% has been documented in previous studies, depending on health status, patient characteristics and patient selection procedures. It has been around 5.9% of an unselected population of community-dwelling elderly persons (Sawin et al)^[9] and in 9.6% and 14.6% of institutionalized elderly men and women, respectively. The prevalence of subclinical hypothyroidism was found in 6.8% of males and 13.8% of females (Mayer et al 2005).^[10] In a study by Nermin Diab et al^[11] on prevalence and risk factors of Thyroid Dysfunction in Older Adults in the Community found that the prevalence of overt and subclinical hypothyroidism was 0.82% and 6.06%, respectively. Overt and subclinical hyperthyroidism affected 0.26% and 0.78%, respectively.

A 20 year follow-up study of the original Wickham Survey found no association between subclinical hypothyroidism and the development of coronary artery disease. An association between CAD and subclinical hypothyroidism has been reported in elderly women in the Rotterdam Study.^[12] In a study conducted in elderly women and in elderly men by Min Min Mya and Wilbert S. Aronow, 11% of CAD patients were associated with subclinical hypothyroidism.^[13] Analysis of the relationship between subclinical hypothyroidism and myocardial

infarctions in The Rotterdam Study revealed an attributable risk of 60% (subclinical hypothyroidism contributed to 60% of the myocardial infarctions in the women who had subclinical hypothyroidism).^[14]

CONCLUSIONS

The prevalence of subclinical hypothyroidism is considerably high in this study (15.8%). The prevalence increases as the age advances and the prevalence is more in females than in males. There is a lack of relationship between clinical symptoms and the thyroid status in elderly. The thyroid disease should be considered during routine evaluation of this susceptible group and should be followed by appropriate detection and treatment. Further research may determine whether treatment of subclinical hypothyroidism will benefit in preventing adverse health outcomes.

ACKNOWLEDGEMENTS:

We would like to thank all the participants who have participated in the study.

References:

- 1) WHO Factsheets on Ageing and Health. Accessed from the following weblink: <https://www.who.int/news-room/factsheets/detail/ageing-and-health#:~:text=People%20worldwide%20are%20living%20longer,aged%2080%20years%20or%20older> [Last accessed on 10-08-2020]
- 2) Adhikari P. Geriatric health care in India - Unmet needs and the way forward. Arch Med Health Sci 2017;5:112-4
- 3) Cooper DS. Subclinical hypothyroidism. JAMA 1987;258: 246-7.
- 4) Kim YA, Park YJ. Prevalence and risk factors of subclinical thyroid disease. Endocrinol Metab (Seoul). 2014;29(1):20-29.
- 5) Diab N, Daya NR, Juraschek SP, et al. Prevalence and Risk Factors of Thyroid Dysfunction in Older Adults in the Community. Sci Rep. 2019;9(1):13156.
- 6) Pasqualetti G, Tognini S, Polini A, Caraccio N, Monzani F. Is subclinical hypothyroidism a cardiovascular risk factor in the elderly?. J Clin Endocrinol Metab. 2013;98(6):2256-2266.
- 7) Calsolaro V, Niccolai F, Pasqualetti G, et al. Overt and Subclinical Hypothyroidism in the Elderly: When to Treat?. Front Endocrinol (Lausanne). 2019;10:177.
- 8) Sundeep Nutakki, V. Rama Mohana Rao, G. Swarnalatha Devi. Study on Subclinical Hypothyroidism- Prevalence and Associated Factors in Elderly Patients. Int J Sci Res 2020;9(1):21-23.
- 9) Sawin CT, Geller A, Hershman JM et al: The aging thyroid: The use of thyroid hormone in older persons JAMA1989.; 261 2653.
- 10) Mayer O, Jr, Simon J, Hrbkova J, et al. Epidemiological study of hypothyroidism as cardiovascular risk in population. Cas Lek Cesk. 2005;144:459-64.
- 11) Diab N, Daya NR, Juraschek SP, et al. Prevalence and Risk Factors of Thyroid Dysfunction in Older Adults in the Community. Sci Rep. 2019;9(1):13156.
- 12) Turnbridge WMG, Evered DC, Hall R, et al. The spectrum of thyroid disease in a community: the Wickham survey. Clin Endocrinol (Oxf). 1977; 7: 481-493.
- 13) Min Min Mya and Wilbert S. Aronow. Subclinical Hypothyroidism Is Associated With Coronary Artery Disease in Older Persons. Journal of Gerontology: MEDICAL SCIENCES 2002;57(10):M658-M659.
- 14) Hak AE, Pols HAP, Visser TJ, Drexhage HA, Hofman A, Witteman JCM. Subclinical hypothyroidism is an independent risk factor for atherosclerosis and myocardial infarction in elderly women: the Rotterdam Study. Ann Intern Med. 2000;132:270-278.

Date of Submission: 04 July 2020

Date of Peer Review: 15 Aug 2020

Date of Acceptance: 26 Aug 2020

Date of Publishing: 5 September 2020

Author Declaration: Source of support: Nil, Conflict of interest: Nil

Ethics Committee Approval obtained for this study? YES

Was informed consent obtained from the subjects involved in the study? YES

For any images presented appropriate consent has been obtained from the subjects: NA

Plagiarism Checked: Urkund Software

Author work published under a Creative Commons Attribution 4.0 International License



Creative Commons Attribution
4.0 International license

cc BY 4.0

DOI: 10.36848/IJBAMR/2020/16215.55525