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STUDY ON SUBCLINICAL HYPOTHYROIDISM- PREVALENCE AND ASSOCIATED FACTORS IN ELDERLY PATIENTS

General Medicine

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ABSTRACT

INTRODUCTION: Ageing is an inevitable process that converts young adults into older adults with deteriorating physiological fitness and progressively increasing risks of illness and death. The ageing of the endocrine system is characterised by the progressive loss of reserve capacity and impaired homeostatic regulation. These changes may not be clinically apparent under baseline conditions and the presenting manifestations are often nonspecific or muted or atypical or subtle.

AIMS AND OBJECTIVES: 1. To estimate the prevalence of subclinical hypothyroidism in elderly patients attending Geriatric Outpatient Department (Tertiary care centre).

MATERIALS AND METHODS: Outpatient setting in department of general medicine, ASRAM MEDICAL COLLEGE AND HOSPITAL

PERIOD OF STUDY: AUGUST 2017 to OCTOBER 2019

INCLUSION CRITERIA: All patients attending general medicine outpatient clinic during the above mentioned period (maximum of 50 patients).

EXCLUSION CRITERIA: 1. Patients with recent surgery, recent myocardial infarction and with recent acute illness followed by hospitalisation in the past 6 months.

RESULTS: The prevalence of subclinical hypothyroidism is considerably high in this study (16.7%). The prevalence increases as the age advances. The prevalence is more in females than in males.

KEYWORDS

CAD coronary artery disease, FT4 thyroxine ,TSH thyroid stimulating harmone

INTRODUCTION:

Ageing is an inevitable process that converts young adults into older adults with deteriorating physiological fitness and progressively increasing risks of illness and death. The ageing of the endocrine system is characterised by the progressive loss of reserve capacity and impaired homeostatic regulation. These changes may not be clinically apparent under baseline conditions and the presenting manifestations are often nonspecific or muted or atypical or subtle.

Thyroid dysfunction is among the most common endocrine disorders in the elderly second only to Diabetes mellitus. Hypothyroidism is the most frequent thyroid dysfunction. 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. Subclinical hypothyroidism is the most common form of hypothyroidism in elderly. It is defined as a biochemical state characterised by serum Thyroid Stimulating Hormone (TSH) concentration above the statistically defined upper limit of the reference range when serum free Thyroxine (FT4) concentration is within its reference range in the presence of few or no definitive clinical signs or symptoms suggestive of hypothyroidism.

The prevalence of subclinical hypothyroidism is age dependant. In geriatric populations it has been reported to range from 5.9% to 35% depending on health status, patient characteristics and patient selection procedures.

AIMS AND OBJECTIVES:

1. To estimate the prevalence of subclinical hypothyroidism in elderly patients attending Geriatric Outpatient Department (Tertiary care centre).
2. To study the relationship between subclinical hypothyroidism & coronary artery disease.
3. To study the association between subclinical hypothyroidism & lipid levels.
4. To study the correlation of subclinical hypothyroidism & cognitive decline.
5. To study the association between subclinical hypothyroidism & depression.

MATERIALS AND METHODS:

Outpatient setting in department of general medicine, ASRAM MEDICAL COLLEGE AND HOSPITAL

PERIOD OF STUDY: AUGUST 2017 to OCTOBER 2019

INCLUSION CRITERIA: All patients attending general medicine outpatient clinic during the above mentioned period (maximum of 50 patients).

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 hyper- thyroidism) or received STUDY POPULATION – 50 patients were selected from outpatient ,department of general medicine, ASRAM MEDICAL COLLEGE AND GENERAL HOSPITAL.

SAMPLE SIZE: 50 patients from ASRAM GENERAL HOSPITAL

	SUBCLINICAL HYPOTHYROIDISM		Chi-square value	P - value
	NO n(%)	YES n(%)		
Age group				
60-69 years	26(86.7%)	4(13.3%)	0.480	0.787(NS)
70-79years	25(83.3%)	5(16.7%)		
80+ years	24(80.0%)	6(20.0%)		

GENDER	Subclinical hypothyroidism		Chi-square value	P - value
	No n(%)	Yes n(%)		
Male	41(91.1%)	4(8.9%)	3.920	0.048(Sig)
female	34(75.6%)	11(24.4%)		

Odds ratio-3.32 95% CI (1.00-11.36)

CAD	NUMBER(n)	PERCENTAGE(%)
NO	31	56.7%
YES	19	43.3%
TOTAL	50	100%

RESULTS:

- The prevalence of subclinical hypothyroidism is considerably high in this study (16.7%). The prevalence increases as the age advances. The prevalence is more in females than in males.
- Coronary artery disease and dyslipidemia are significantly associated with subclinical hypothyroidism.
- Body Mass Index shares a place in evaluation of subclinical hypothyroidism. There is a lack of relationship between clinical symptoms and the thyroid status in elderly.

DISCUSSION:

Subclinical hypothyroidism is highly prevalent in elderly and more so in women. 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) 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).

Subclinical hypothyroidism was found in 11% of 1149 women, mean age 69 years, participating in the Rotterdam Study. Prevalence of hypothyroidism was shown to gradually increase between age 45 and 60 years and to be higher in females, than in males (Canaris et al 2000; Hollowell et al 2002). 35% of the elderly women attended the outpatient clinic had subclinical hypothyroidism in a study conducted in King Abdulaziz University, Saudi Arabia.

In this study of 90 elderly patients in a tertiary care setting, 15 patients (an over all prevalence of 16.7%) were found to have subclinical hypothyroidism. The prevalence increased as the age advances in this study. The prevalence in 60-69 years age group was 13.3%; the prevalence in 70-79 years age group was 16.7%; the prevalence in 80+ years age group was 20.0%. 11 out of 45 females (24.4%) and 4 out of 45 males (8.9%) had subclinical hypothyroidism. This finding is similar to that of other studies that reported a higher prevalence of subclinical hypothyroidism in elderly women compared with their male counterparts. The prevalence could have been much higher, if the patients with known thyroid dysfunction have also been included. The rationale for identifying subclinical hypothyroidism in the elderly relates to its potential for progressing to overt hypothyroidism. In a longitudinal study of community-dwelling elders, Rosenthal et al found that 30% of elderly subjects with elevated TSH levels developed overt hypothyroidism over a 4-year period. These studies indicate that TSH measurement in the elderly may provide important information about borderline thyroid function prior to complete thyroid failure.

Some studies have suggested that mild symptoms of hypothyroidism are more prevalent in patients with subclinical hypothyroidism than in age-matched controls. The "classic" clinical signs and symptoms of hypothyroidism are no more frequent in patients with elevated TSH than in the euthyroid elderly. Thyroid status could not be predicted from clinical signs and symptoms in this sample of elderly community-dwelling patients (Bemben et al in 1994). In this study, 10 common symptoms of hypothyroidism were considered.

29 out of 90 patients had 3 or more number of symptoms, but among them only 4(13.8%) had subclinical hypothyroidism and 8 out of 15 patients with subclinical hypothyroidism (53.3%) had 2 symptoms. The lack of a relationship between clinical symptoms and thyroid status was further evidenced by the inability of a high frequency of symptoms (≥3) to identify a higher proportion of subclinical hypothyroid patients diagnosed by elevated TSH levels.

The co-morbid illnesses like Diabetes mellitus, Systemic Hypertension, Peripheral vascular disease and Cerebrovascular accidents were also studied in these 90 subjects. Systemic Hypertension was seen in 44 patients (48.9%) and Diabetes mellitus in 25 patients (27.8%), while in the 15 patients with subclinical hypothyroidism, Systemic Hypertension was seen in 10 patients (66.7%) and Diabetes mellitus in 6(40.0%). Co-morbidities typically associated with hypothyroidism were no more significantly prevalent in subclinical hypothyroid patients than in euthyroid patients.

The association of co-morbid illnesses could be further less in the community-dwelling group because the patients attending tertiary care centre would have more ailments than this group. Hypertension is a well known accompanied fact with hypothyroidism and is needed to be studied in a large scale set-up to endorse its relationship with subclinical hypothyroidism.

A 20 year follow-up study of the original Whickham 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. In a study conducted in elderly women and in elderly men in New York Medical College, Valhalla, 11% of CAD patients were associated with subclinical hypothyroidism. 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). In this study, among the 15 subjects with subclinical hypothyroidism, 3(20.0%) did not have CAD and 12(80.0%) had CAD. Conversely, of the 39 subjects with CAD, 12(30.8%) had subclinical hypothyroidism (p-value 0.002). Of the 11 females with subclinical hypothyroidism, 8(72.7%) had CAD and 3(27.3%) did not have CAD (p-value 0.046). This shows a significant relationship between subclinical hypothyroidism and CAD.

In the above mentioned study conducted in New York Medical College, only two men in the study had subclinical hypothyroidism and both men had electrocardiographic evidence of Q-wave myocardial infarction. In this study, of the 4 males with subclinical hypothyroidism, all the 4(100%) had CAD, showing a very strong relationship between CAD and subclinical hypothyroidism. So, further evaluation is needed and to be performed with large sample size to support the association of subclinical hypothyroidism with CAD in elderly men.

Thyroid Guide Mary Shomon point out that subclinical hypothyroidism is associated with metabolic syndrome. In this study among the 90 subjects, 13(14.4%) were under weight, 25(27.8%) were normal, 19(21.1%) were over weight and 33(36.7%) were obese.

Of the 15 subjects with subclinical hypothyroidism, 3 (20.0%) were under weight, 1(6.7%) were normal, 4(26.7%) were over weight and 7(46.7%) were obese (pvalue 0.259). Though there is no significant correlation with increase in BMI and subclinical hypothyroidism, it is prudent to note that only 1 out of 15 (6.7%) subjects with subclinical hypothyroidism had normal BMI and all the others (93.3%) were either under-nourished or over- nourished.

CONCLUSION:

- Body Mass Index shares a place in evaluation of subclinical hypothyroidism.
- There is a lack of relationship between clinical symptoms and the thyroid status in elderly.
- The study failed to endorse the association of subclinical hypothyroidism with comorbid illnesses, depression and dementia.
- The cross-sectional nature of this analysis makes it difficult to ascribe causality to any associations found. Because we do not know whether thyroid test abnormalities preceded elevations in lipid levels and coronary artery disease, it cannot be definitely stated that one leads to the other. Further evaluation of this relationship with longitudinal data would be necessary to support a causal link.
- The evaluation of patients from population-based screening programs who are found to have subclinical hypothyroidism rather than those referred for specialty management would be useful in determining the magnitude of the disease.
- 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.

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