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ORIGINAL RESEARCH

Assessment of thyroid profile in geriatric population

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ABSTRACT:

Background: It is an established fact that the thyroid hormone helps in maintaining metabolism, growth and various other functions in human body. Just like other changes in the body, with advancing age, the endocrine system also shows age related changes. Hence; the present study was undertaken for assessing the thyroid profile in geriatric population. **Materials & methods:**. A total of 100 patients of age more than 60 years were analysed. Cases were drawn from general medicine ward, general outpatient department from Dr. D.Y.Patil hospital and research centre. A detailed clinical history was taken of all the patients regarding symptoms of hypothyroidism and hyperthyroidism. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi-square test and student t test were used for analysis of level of significance. **Results:** Mean age of the patients was 68.15 years. Mean T3 levels was found to be 1.38 ng/ml while mean T4 and TSH levels was found to be 6.08 µg/dL and 9.24 µIU/ml respectively. Mean T3, T4 and TSH levels among males was found to be 1.39 ng/ml, 6.04 µg/dL and 7.46 µIU/ml respectively. Mean T3, T4 and TSH levels among females was found to be 1.38 ng/ml, 6.11 µg/dL and 10.02 µIU/ml respectively. 14 percent of the patients had clinical hypothyroidism while 10 percent and 2 percent of the patients had subclinical hypothyroidism and hyperthyroidism respectively. **Conclusion:** Thyroid dysfunction is common in elderly subjects with hypothyroidism being the most common abnormality detected. A strong clinical awareness is needed in the elderly population because of the subtle clinical presentations.

Key words: Thyroid, Profile, Geriatric

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INTRODUCTION

It is an established fact that the thyroid hormone helps in maintaining metabolism, growth and various other functions in human body. Hypothalamic-pituitary-thyroid axis is a sort of self-regulation mechanism which is constituted by the thyroid gland, anterior pituitary gland, and hypothalamus. Thyroxine or tetraiodothyronine (T4) and triiodothyronine (T3) are the chief hormones which are released by the thyroid gland. Thyrotropin-releasing hormone (TRH) produced by hypothalamus, thyroid-stimulating hormone (TSH) formed by anterior pituitary gland, and T4 work in association with each other to establish a properly regulated feedback system and homeostatic mechanism. The presentations of hypothyroidism include bradycardia, the phenomenon of cold intolerance, development of constipation, feeling of fatigue, and weight gain. On the other hand hyperthyroidism causes diarrhoea, development of heat intolerance, occurrence of fine tremor, loss of weight and muscle fatigue.[1-3]

Just like other changes in the body, with advancing age, the endocrine system also shows age related changes. Both, the quantity of the hormones produced and the sensitiveness of the target tissues are responsible for the various age related changes. In a few cases the quantity of the hormones secreted may be primarily responsible for these changes and in others the altered sensitivity of target organs may play the main role. Concurrent alterations in the metabolic rate of other hormones may also be witnessed.[4]

Thyroid gland and other endocrine glands all undergo functional modifications as the age increases. Establishment of an upper limit for the physiologic value of TSH among general population has inferences for the diagnosis of subclinical hypothyroidism along with associated matters such as screening, association with

comorbidities, especially cardiovascular risks, and treatment.[5] Hence; the present study was undertaken for assessing the thyroid profile in geriatric population.

MATERIALS & METHODS

The present study was undertaken with the aim of assessing the thyroid function in geriatric population. A total of 100 patients of age more than 60 years were analysed. Cases were drawn from general medicine ward, general outpatient department from Dr. D.Y.Patil hospital and research centre. A detailed clinical history was taken of all the patients regarding symptoms of hypothyroidism and hyperthyroidism.

Inclusion criteria

- Age More than 60 years without any apparent symptoms of hypothyroidism or hyperthyroidism.

Exclusion criteria

- K/C/O Thyroid Dysfunction.
- Subjects on drugs known to cause thyroid dysfunction for atleast 2 months.

Statistical analysis

All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Chi-square test and student t test were used for analysis of level of significance.

RESULTS

Mean age of the patients was 68.15 years. 69 percent of the patients were males while the remaining were males. Diabetes and hypertension were found to be present in 26 percent and 45 percent of the patients. Mean T3 levels was found to be 1.38 ng/ml while mean T4 and TSH levels was found to be 6.08 µg/dL and 9.24 µIU/ml respectively. Mean T3, T4 and TSH levels among males was found to be 1.39 ng/ml, 6.04 µg/dL and 7.46 µIU/ml respectively. Mean T3, T4 and TSH levels among females was found to be 1.38 ng/ml, 6.11 µg/dL and 10.02 µIU/ml respectively. 14 percent of the patients had clinical hypothyroidism while 10 percent and 2 percent of the patients had subclinical hypothyroidism and hyperthyroidism respectively. Dyslipidemia was present in 4.05 percent, 14.29 percent, and 10 percent of the patients with Euthyroid, clinical hypothyroidism and subclinical hypothyroidism.

Table 1: Thyroid profile

Thyroid profile	Mean	SD
T3 (ng/ml)	1.38	0.69
T4 (µg/dL)	6.08	4.33
TSH (µIU/ml)	9.24	13.17

Table 2: Thyroid profile among subjects divided on the basis of gender

Gender	T3 (ng/ml)		T4 (µg/dL)		TSH (µIU/ml)	
	Mean	SD	Mean	SD	Mean	SD
Males	1.39	0.72	6.04	2.69	7.46	11.08
Females	1.38	0.68	6.11	4.90	10.02	14.01

Table 3: Prevalence of thyroid dysfunction

Thyroid dysfunction	Number of patients	Percentage
Euthyroid	74	74
Clinical hypothyroidism	14	14
Subclinical hypothyroidism	10	10
Hyperthyroidism	2	2

DISCUSSION

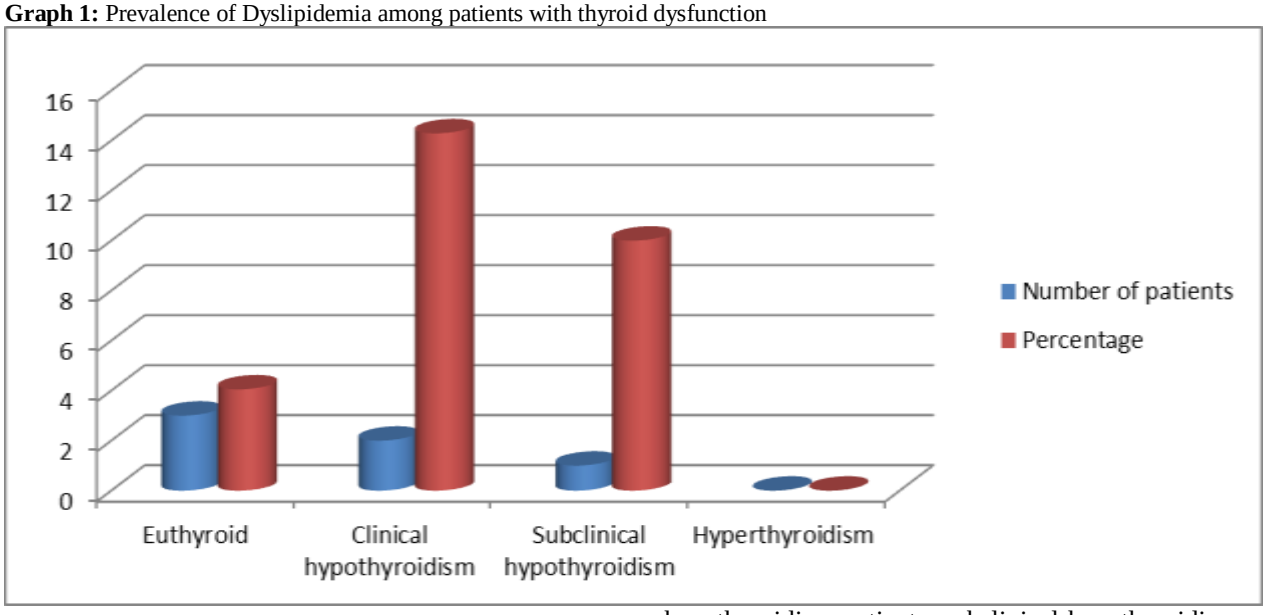
Across the globe, there is continuous and substantial increase in geriatric population. It is postulated those in coming years; majority of the geriatric population would be present in developing nations. Enhancement of living lifestyle and improved healthcare amenities has resulted in decline in death rate and greater life expectancy. Geriatric health has never been as important as it is today, due to rapid advances in medical science and increase in-depth knowledge about various disease has led to better management of diseases, in turn leading to decrease in mortality and increase in geriatric population. However reference values have been reasonably well established in younger population and middle aged population, but data for the elderly population is lacking.[5-8]

In the present study, Mean T3 levels was found to be 1.38 ng/ml while mean T4 and TSH levels was found to be 6.08 µg/dL and 9.24 µIU/ml respectively. Mean T3 levels among the subjects between 60 to 65 years of age was 1.28 ng/ml while T4 and TSH levels among the subjects between 60 to 65 years of age was 6.25 µg/dL and 4.34 µIU/ml respectively. Mean T3 levels among the subjects between 66 to 70 years of age was 1.51 ng/ml while T4 and TSH levels among the subjects between 60 to 65 years of age was 6.86 µg/dL and 4.01 µIU/ml respectively. Mean T3 levels among the subjects of more than 80 years of age was 1.82 ng/ml while T4 and TSH levels among the subjects of more than 80 years of age was 6.62 µg/dL and 18.53 µIU/ml respectively. Although non-significant, a slight increasing trend of T3 and TSH has been observed with increasing age in the present study.

Table 4: Clinical profile

Clinical profile	Euthyroid	Clinical hypothyroidism	Subclinical hypothyroidism	Hyperthyroidism
Weight gain	0	8	3	0
Fatigue	0	12	4	0
Tremors	0	7	2	1
Weight loss	0	0	2	2
Palpitations	0	9	3	0
Thyroid swelling	1	4	0	1

Graph 1: Prevalence of Dyslipidemia among patients with thyroid dysfunction



Our results were in concordance with the results obtained Pratap et al who also reported similar findings in their study. This can be explained by the fact that there is decreased production of thyroid binding globulin in elderly which results in decrease in total T4 measured, however there is also decreased conversion of T4 to T3 due to deficiency of the enzymes deiodinase which results in comparative increase in T4 levels. It is believed that there is resetting of the hypothalamo – pituitary axis along with decrease in T3 which in turns stimulate TSH production due to decrease in the negative feedback of T3.[9] Fontes et al. evaluated prospectively 1200 subjects of both sexes. They found TSH increased with age in the whole group. There was no statistical difference in the analysis of these independent subgroups: 60–69 versus 70–79 years old.[10]

Euthyroid was present in 74 percent of the patient population, while clinical hypothyroidism, subclinical hypothyroidism and hypothyroidism was seen in 14 percent, 10 percent and 2 percent of the elderly subjects. Our results were in concordance with the results obtained by previous authors who also reported similar findings. In a previous study conducted by Kumar H et al, the prevalence of hyperthyroidism, euthyroidism, and hypothyroidism according to age was 5.9%, 80.9%, and 13.2%, respectively.[11]

In Sau Paulo Ageing and Health Study, the prevalence of overt and subclinical hypothyroidism among elderly population was found to be 5.7% and 6.5% respectively. Leiden study in geriatric subjects reported prevalence of overt and subclinical hypothyroidism among elderly population to be 7% and 5% respectively.[12, 13]

Dyslipidemia was present in 4.05 percent, 14.29 percent, and 10 percent of the patients with Euthyroid, clinical hypothyroidism and subclinical hypothyroidism. Our results were in concordance with the results obtained by previous authors who also reported similar findings in their respective studies. Madhuvan et al, in their study reported that mean TC levels among overt hypothyroidism patients, subclinical hypothyroidism and hyperparathyroidism patients was 203 mg/dL, 216 mg/dL and 189 mg/dL respectively.[8]

In a previous study conducted by Kumar H et al authors studied the presentation and clinical profile of thyroid disorder in elders. There were 456 cases in the age group 60–71 years. 71–80 and >80 years patients were in numbers of 57 and 20, respectively. Prevalence of hyperthyroidism, euthyroidism, and hypothyroidism according to age was 5.9%, 80.9%, and 13.2%, respectively. A highly significant difference was found in weakness, feeling cold, constipation, palpitation, and diarrhoea while significant difference was founding menstrual irregularity, hoarseness of voice, and irritability.[11]

CONCLUSION

Thyroid dysfunction is common in elderly subjects with hypothyroidism being the most common abnormality detected. A strong clinical awareness is needed in the elderly population because of the subtle clinical presentations.

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