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Research Article

PREVALENCE OF THYROID DYSFUNCTION IN PREVIOUSLY DIAGNOSED DIABETES MELLITUS IN GERIATRIC AND NON-GERIATRIC PATIENTS

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ABSTRACT

Objectives: The aim of the study was to assess the prevalence of thyroid dysfunction in previously diagnosed diabetes mellitus in geriatric and non-geriatric patients.

Methods: The present study was done at a medical college tertiary care center that caters to the needs of a vast amount of population in and around the region of Indore.

Results: In the present study, we noted that the thyroid stimulating hormone levels were higher in the older population as compared to the non-geriatric group which was significant p=0.002. In the present study, we noted that the overall mean levels of thyroid stimulating hormone were 3.89 mg/dL standard deviation (SD) + 4.57, in the non-geriatric group, the mean levels of thyroid stimulating hormone were 4.63 mg/dL SD + 5.15 mg/dL and in the geriatric group, the mean levels of thyroid stimulating hormone were 13.15 mg/dL SD + 3.81 mg/dL. In the present study, we noted that the thyroid stimulating hormone levels were higher in the older population as compared to the non-geriatric group which was significant p=0.002.

Conclusion: The disease diabetes mellitus has a higher prevalence in males as compared to the females with the male-to-female ratio being (1.57:1), and this trend was same in both the study groups non-geriatric (1.8:1), and geriatric (1.68:1).

Keywords: Prevalence, Thyroid dysfunction, Geriatric, Non-geriatric, Diabetes mellitus.

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INTRODUCTION

It has been noted that in the Indian population, incidence of thyroid disorder is common in Indian population and its incidence rises with advancing age [1]. The thyroid is one organ which helps to maintain the orchestra of the body [2]. Its abnormality can range from an asymptomatic phase and can be as deadly as a seizure disorder or cardiac dysfunction [3-6]. To screen for the presence of thyroid disorder, the routinely performed investigations are the biochemical markers of the thyroid gland function namely the thyroid stimulating hormone (TSH) (TSH, free T3, and free T4. These laboratory parameters are relatively inexpensive and quite reliable [7,8]. Screening for thyroid disorder is indicated for the certain high-risk patients such as elderly and those already having other endocrinal disorders [9-11]. It has been noted that those patients with diabetes mellitus have a higher probability to develop dysfunction related to the thyroid gland when compared to the normal population, also this is more likely if the patient is an elderly diabetic female patient [10].

The studies have also suggested that it is better to screen for thyroid dysfunction in the diabetic patients on an annual basis as they are more prone for thyroid disorders [12]. There are various studies that have shown a finding that a higher than normal prevalence of thyroid disorders in Type 2 diabetic patients, of which hypothyroidism is the most common disorder. When all thyroid disorders are considered, hypothyroidism is the most common thyroid disorder in the overall adult population and more so in the elderly women. It is frequently autoimmune in nature and usually has a clinical presentation of primary atrophic hypothyroidism or Hashimoto's thyroiditis [13]. India has a vast amount of aging population that has been increasing over the past few decades as a result of improvement in the economic status of individuals and the better health-care facilities that are available [14-16]. With the increase in the aging population, there has been a rise in the prevalence of diseases of chronic nature like hypertension and diabetes mellitus [14-16]. India has also been labeled as the capital of diabetes in the global platform. Owing to this we at the Sri Aurobindo medical college Indore, Madhya Pradesh, India, decided to evaluate the prevalence of thyroid dysfunction in patients who have been diagnosed with diabetes mellitus.

Objectives

The aim of the study was to assess the prevalence of thyroid dysfunction in previously diagnosed diabetes mellitus in geriatric and non-geriatric patients.

METHODS

After approval from ethics committee, This observational study was done among 200 patients who came seeking medical attention at Sri Aurobindo Medical College and Post Graduate Institute Hospital. All study participants patients having diabetes mellitus and healthy individuals coming for regular health check-up with no comorbidities detected were included in this study as controls.

Inclusion criteria

Age below 60 years is considered as non-geriatric age group and ≥60 years of age was considered geriatric age group in this study.

Patient with diabetes mellitus.

Patients with raised HBA1C level.

Patients with elevates TSH level with raised blood sugars.

Healthy individuals coming for executive health check-up as controls were included in the study.

Exclusion criteria

The following criteria were excluded from the study:

1. Patients not giving written consent
2. Patient only having Thyroid disorder.

Methodology

Patients who attended the emergency/OPD were explained in brief about the study and asked to participate in the study. Informed written consent was taken from all the patients in writing after they gave a verbal consent for the study. The study methodology and concept with its benefits and limitations was explained in detail to the patients. The data were then collected. A pre-structured proforma was used to collect the baseline data. Detailed clinical examination and the relevant laboratory and biochemical tests were done on all the patients.

Sample size

Two hundred patients with diabetes mellitus of with 100 patients were geriatric age group and 100 patients of non-geriatric age group.

All the patients diagnosed with diabetes mellitus were thoroughly investigated and relevant personal history and medical history were obtained. The data were also obtained from blood investigations, which was be directly transcribed from the reports to the proforma and then tabulated in the Microsoft Excel sheet and then Statistical Package for the Social Sciences version 23 was used to do the analysis.

OBSERVATION AND RESULTS

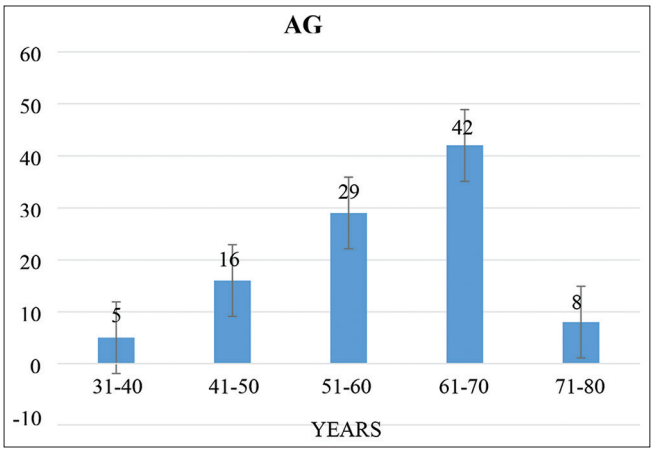
Graph 1 showed that the overall mean age of the study cases was 59.19 years standard deviation (SD) + 6.49 years. In the non-geriatric age group, the mean age was 49.6 years SD + 8.15 years and in the geriatric age group, the mean age was 68.78 years SD + 4.83 years. The most common age group in the study was between the age of 61–70 years with of the study population. The age group in the present study ranged between the age of 30 years and 79 years.

Graph 2 showed that the overall mean FBS were 194.16 mg/dL SD + 77.93; in the geriatric group, the mean FBS were 211.01 mg/dL SD + 94.87 mg/dL and in the non-geriatric group, the mean FBS were 177.30 mg/dL SD +60.99 mg/dL.

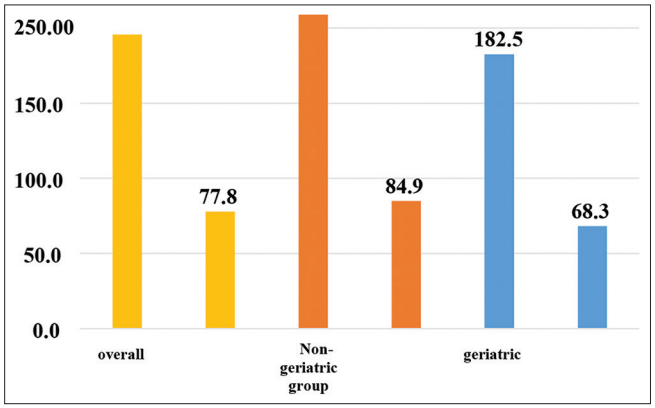
Table 1 showed that the overall mean levels of thyroid stimulating hormone were 3.89 mIU/L SD + 4.57 mIU/L; in the non-geriatric group, the mean levels of thyroid stimulating hormone were 4.63 mIU/L SD + 5.15 mIU/L and in the geriatric group the mean levels of thyroid stimulating hormone were 5.86 mIU/L SD + 4.91 mIU/L. In the present study, we noted that the thyroid stimulating hormone levels were higher in the older population as compared to the non-geriatric group which was significant p=0.002.

Table 2 showed that in the non-geriatric age group, we had 2% who were hyperthyroid, 26% who were hypothyroid, and 72% who were euthyroid. In the geriatric age group, we had 3% who were hyperthyroid, 31% who were hypothyroid, and 66% who were euthyroid.

Table 3 showed that in the non-geriatric age group we had 16% who were subclinical hypothyroid. In the geriatric age group, we had 20% who were subclinical hypothyroid. Overall, we had 18% who were subclinical hypothyroidism.



Graph 1: Distribution of study participants according to age



Graph 2: Distribution of study participants according to fasting blood sugar (FBS).

Table 1: Thyroid stimulating hormone

Group	Statistic	TSH 0.5–6.0 mIU/L
Overall	Mean	3.89
	SD	4.57
Non-geriatric	Mean	4.63
	SD	5.15
Geriatric	Mean	5.86
	SD	4.91
Paired t-test p-value	t-test	0.002
Significance	S	

SD: Standard deviation, TSH: Thyroid stimulating hormone

Table 2: Functioning of thyroid stimulating hormone

Group	TSH	Frequency	Percentage
Non-geriatric	Hyperthyroid	2	2
	Hypothyroid	26	26
	Euthyroid	72	72
	Total	100	100
Geriatric	Hyperthyroid	3	3
	Hypothyroid	31	31
	Euthyroid	66	66
	Total	100	100

TSH: Thyroid stimulating hormone

Table 3: Subclinical hypothyroidism (thyroid dysfunction)

Group	TSH	Frequency	Percentage
Non-geriatric (100 cases)	Subclinical hypothyroid	16	16
	Total hypothyroid	26	26
Geriatric (100 cases)	Subclinical hypothyroid	20	20
	Total hypothyroid	31	31
Overall (200 cases)	Subclinical hypothyroid	36/200	18
	Total hypothyroid	57/200	28.5

TSH: Thyroid stimulating hormone

DISCUSSION

Thyroid dysfunction in diabetes in the study was as follows:

In the non-geriatric age group, we had 2% who were hyperthyroid, 72% were euthyroid, and 26% who were hypothyroid. In the geriatric age group, we had 3% who were hyperthyroid, 66% who were euthyroid, and 31% who were hypothyroid.

The incidence of thyroid dysfunction also increased with age as compared to the non-geriatric group which was the incidence higher in older age group the frequency of uncontrolled diabetes in our study 65%. Kunal et al. [17] noted that 22.22% of uncontrolled diabetes is possibly because of the region of the study was done is an area where people are more heath conscious and adhere to the prescription. Agrawal noted that thyroid dysfunction was seen in 27.8%. The subclinical hypothyroidism was noted in 15.2% and 10.6% overt hypothyroidism and 2% had hyperthyroidism [18]. Papazafiropoulou et al. studies have shown that the prevalence of thyroid dysfunction in T2DM was 12.3%.which is much lesser than our study possibly because of the different ethnicity [19].

Subclinical hypothyroid

In the non-geriatric age group, we had 16% who were subclinical hypothyroid. In the geriatric age group, we had 20% who were subclinical hypothyroid. Overall, we had 18% out of 200 cases who were subclinical hypothyroid in the study.

Ramasamy *et al*. 10% were subclinical [20].

Agrawal noted subclinical hypothyroidism was noted in 15.2% [18].

Ravishankar *et al*. at Hosakote, Bangalore, noted that thyroid dysfunction sub-clinical hypothyroidism was elderly diabetics, 18.2% were female [21].

Gupta A *et al*. studies found that the prevalence of subclinical hypothyroidism was (31.03%) [22].

CONCLUSION

Our study concluded that the disease diabetes mellitus itself has a higher prevalence in males as compared to the females with the male-to-female ratio being (1.57:1), and this trend was same in both the study groups non-geriatric (1.8:1), and geriatric (1.68:1). There is a linear increase with the prevalence of thyroid disorders with age. The incidence of thyroid dysfunction also increased with age as compared to the non-geriatric group which was the incidence higher in older age group.

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CONFLICTS OF INTEREST

None declared.

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Nil

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