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The incidence of thyroid dysfunction in diabetic patients – A study done at a tertiary care center in South India

Sethu Stephen[1], **Sancy Mary Sam**[2,*]

[1]*Dept. of Surgery, Al-Azhar Medical College Thodupuzha, Kerala, India*
[2]*Dept. of Pharmacology, Al-Azhar Medical College Thodupuzha, Kerala, India*

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ABSTRACT

Background and Objective: It has been noted that in the Indian population the incidence of thyroid disorder is common and its incidence rises with advancing age. Screening for thyroid disorder is indicated for the certain high risk patients such as elderly and those already having other endocrinal disorders 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 commonest disorder Owing to this we at the medical college at south India decided to evaluate the occurrence of thyroid dysfunction in patients who have been diagnosed with diabetes mellitus and also to compare the level of thyroid dysfunction in the younger and the older population.

Materials and Methods: Department of surgery, medicine and Pharmacology at Al Azhar Medical College Thodupuzha, Kerala, India for a duration of 3 years on 300 patients. The present study was an observational study during the period of study, the test subjects patients having diabetes mellitus and healthy individuals (Controls)coming for regular health check-up with no co morbidities detected were included in this study as controls.

Results: 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 commonest 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.

The incidence of diabetes mellitus increased with age, but the control of sugars is better with age thyroid dysfunction was as follows 20% had hyperthyroidism (36%) hypothyroidism. There is a linear increase with the prevalence of thyroid disorders with age with a $r = 0.77$ and $p < 0.05$.

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 $p < 0.05$.

Conclusion: This study reveals about at least one in three who have DM are suffering from thyroid dysfunction, that increases with increasing age and uncontrolled sugars in this part of the world, which might warrant routine screening.

1. Introduction

It has been noted that in the Indian population the incidence of thyroid disorder is common 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]

* *Corresponding author.*
E-mail address: sancy.sam@gmail.com (S. M. Sam).

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In order to screen for the presence of thyroid disorder the routinely performed investigations are the biochemical markers of the thyroid gland function namely the TSH (thyroid stimulating hormone, 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 who have diabetes mellitus have a higher probability to develop of 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 population 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 commonest disorder. [12]

When all thyroid disorders are considered, hypothyroidism is the commonest 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]

Diabetes mellitus is a disease which was known since the time people knew about medicine. It has been described in literature even before 2000 years. [17]

The term diabetes mellitus is derived from the Greek word switch on translation refers torun through comes (Dia-Through, Bainein-To go) this was named by Aretaeus of Cappadocia because he noticed that the disease had a peculiar quality of affecting the patients body habitus leading to what he termed as "a liquefaction of flesh and bone in to urine". India has also been labelled as the capital of diabetes in the global platform.

Owing to this we at the medical college at south India decided to evaluate the occurrence of thyroid dysfunction in patients who have been diagnosed with diabetes mellitus and also to compare the level of thyroid dysfunction in the younger and the older population.

2. Materials and Methods

Department of surgery, medicine and Pharmacology at Al Azhar Medical College Thodupuzha, Kerala, India for a duration of 3 years on 300 patients. The present study was an observational study during the period of study, the test subjects patients having diabetes mellitus and healthy individuals (Controls)coming for regular health check-up with no co morbidities detected were included in this study as controls.

Age below 60 years is considered as non geriatric age group and greater than & equal to 60 years of age was considered geriatric age group in this study. Healthy individuals coming for executive health check-up as controls were included in the study. Patients 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. Detailed clinical examination and the relevant laboratory and biochemical tests were done on all the patients.

A descriptive analysis of the population was carried out. The categorical or dichotomous variables were expressed as absolute values and percentages, and will be compared with Pearson test. The continuous variables with a normal distribution were described as the mean (+/-SD). The correlation between two quantitative variables was carried out by using PEARSON'S coefficient of correlation.

The disease diabetes mellitus itself has a higher prevalence in males as compared to the females with the male to female ratio being (1.87:1), and this trend was same in both the study groups non -geriatric (1.21:1), and geriatric (1.68:1). non – geriatric (63%) and the geriatric group (64%) males thyroid stimulating hormone in the non -geriatric group the mean levels of thyroid stimulating hormone were 4.63 mg/dl SD + 1.15 mg/dl and in the geriatric group the mean levels of thyroid stimulating hormone were 14.15 mg/dl SD + 4.81 mg/dl. thyroid stimulating hormone levels were higher in the older population as compared to the non -geriatric group which was significant p= 0.001. glycosylated hemoglobin in the non -geriatric group the mean glycosylated hemoglobin were 10.92% SD + 2.13 % and in the geriatric group the mean glycosylated hemoglobin were 8.16 % SD +3.83 %. control of sugars were better in the older population which was significant p= 0.04.

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 commonest 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.

The incidence of diabetes mellitus increased with age, but the control of sugars is better with age thyroid dysfunction was as follows 20% had hyperthyroidism (36%) hypothyroidism. There is a linear increase with the prevalence of thyroid disorders with age with a r= 0.77 and $p < 0.05$.

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 $p < 0.05$.

3. Discussion

Diabetes mellitus is the commonest endocrine disorder that affects mankind. Diabetes mellitus is a disease that is fast gaining the status of a potential epidemic in India with more than 62 million diabetic individuals currently diagnosed with the disease.[14,15] The present scenario is such that, India has topped the world with the maximum number of individuals that have been affected by with diabetes mellitus.[14,15] Diabetes is a common disease affecting about 14.8% in rural and 19.7% in urban dwellers in India.[16,18]

Diabetes can be diagnosed by the presence of the typical signs and symptoms of diabetes mellitus and evident rise of the blood glucose levels in the fasting state above 140 mg/dl, or the venous plasma glucose level more than200 mg/dl exactly after 2 hours following a 75-g oral glucose challenge.[17]

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It has been seen that when the levels of circulating insulin is more stating a state of insulin resistance it has a proliferative effect on thyroid tissue resulting in larger thyroid size with increased formation of nodules. Grave's orbitopathy is also noted to be at a higher prevalence in those who have type 1 DM also dysthyroid optic neuropathy is higher.[17]

Ravishankar et al at Hosakote, Bangalore noted that thyroid dysfunction in 29% 36% females and 22% 31.25 % of Sub- clinical hypothyroidism were elderly diabetics 18.2 % were female.[17]

Ghawil et al. documented that 23.4% of type 1 diabetic Libyan subjects had positive TPO antibodies and 7% had positive TG antibodies. The association between AITD and T1DM has been recognized as a variant of APS3 referred to as APS3 variant.[19]

Vikram et al atpune noted 30% had thyroid dysfunction of which 22 % had hypothyroidism and 8 % had hyperthyroidism.[20]

Ramasamy et al evaluated 120 diabetics and noted that hypothyroidism was seen in 27% overall in which 10% were subclinical, 80% were females. 70% aged between 40-60 years age. 2. 2% of had goiter

Navneet Agrawal noted thyroid dysfunction was seen in 27.8%. The subclinical hypothyroidism was noted in 15.2% and 10.6% overt hypothyroidism and 2% had hyperthyroidism.[21]

4. Conclusion

This study reveals about at least one in three who have DM are suffering from thyroid dysfunction, that increases with increasing age and uncontrolled sugars in this part of the world, which might warrant routine screening.

5. Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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None.

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Author biography

Sethu Stephen, Assistant Professor

Sancy Mary Sam, Associate Professor

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