ASSESSMENT OF THYROID FUNCTION AMONG DIABETES MELLITUS PATIENTS

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Conflict of interest: Nil

Abstract

Background: Thyroid disorders are reported in higher magnitude among general population, although its prevalence is not as high as prevalence of diabetes mellitus. Thyroid disorders are endocrine in nature as diabetes mellitus and various studies were conducted to find out correlation between both the disorders.

Material & Methods: Patients who were presenting with type 2 diabetes mellitus and confirmed with laboratory investigations and healthy controls were enrolled from outdoor and from ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant

Conclusion: We concluded from the present study that the patients of diabetes mellitus had higher prevalence of thyroid dysfunction in comparison to the healthy controls enrolled in the study. We found subclinical hypothyroidism was more common than clinical hypothyroidism.

Key words: thyroid dysfunction, diabetes mellitus, hypothyroidism, hyperthyroidism.

INTRODUCTION

Diabetes is a chronic disease in etiology and occurs when the pancreas does not produce enough amount of insulin or when there is resistance towards its action on the body (1). In 2014, WHO reports that 8.5% of adults who aged 18 years or above had diagnosed with diabetes. In 2016, WHO reports that diabetes was the directly responsible for 1.6 million mortality occurred worldwide. It was estimated that by the year 2030 diabetes will become seventh leading cause of mortality worldwide (2). The prevalence of non-communicable diseases is increasing compared to communicable diseases. Among the non-communicable diseases, diabetes mellitus is rapidly increasing globally and affecting all the age groups. (3). In India, the prevalence of diabetes is increasing and imposing challenges on health care infrastructure of the country. (4).

The overall prevalence of diabetes reported by WHO was 8.7% among the age group of 20 and 70 years. This rising prevalence depends on various factors

such as, sedentary lifestyles, rapid urbanization, unhealthy diets and substance use/abuse along with increasing life expectancy (5). Obesity and overweight are also the most important associated risk factors. The onset of diabetes can be prevented or delayed by life style and behavioral changes by taking healthy diet and routine physical activity (6). Thyroid disorders are reported in higher magnitude among general population, although its prevalence is not as high as prevalence of diabetes mellitus. Thyroid disorders are endocrine in nature as diabetes mellitus and various studies were conducted to find out correlation between both the disorders (7). Hence, we conducted present study to find out association between the thyroid disorders and type 2 diabetes mellitus.

MATERIALS & METHODS

The present prospective study was conducted at department of general medicine of our tertiary care hospital. The study duration was of one year from January 2018 to December 2018. A sample size of 200 was calculated at 95% confidence interval at 10%

acceptable margin of error by epi info software version 7.2. Patients who were presenting with type 2 diabetes mellitus and confirmed with laboratory investigations and healthy controls were enrolled from outdoor and from ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant.

The data were collected by detailed history, general physical and clinical examination from each patient after taking the written consent. The hematological investigation was done for fasting and post prandial blood sugar, glycosylated hemoglobin (HbA1c) and thyroid profile. Patients who had chronic diseases such as cardiac diseases, liver and renal diseases, hypertension and cancer were excluded from the study. Data analysis was carried out using SPSS v22. All tests were done at alpha (level significance) of 5%; means a significant association present if p value was less than 0.05.

RESULTS

In the present study we enrolled 100 patients of diabetes mellitus who were aged from 27 to 58 years. The mean age of the enrolled patients was 42 ± 5.6 years. In the present study we enrolled 100 healthy controls who were aged from 24 to 55 years. The mean age of the enrolled controls was 37 ± 6.8 years. Out of total patients diagnosed with diabetes mellitus 59% patients were male and 41% patients were females. Out of total healthy controls 56% were male and 44% were females. On the assessment of BMI it was found that patients diagnosed with diabetes mellitus had mean BMI of 29.1 ± 2.4 and controls had mean BMI of 28.5 ± 3.1 . On the assessment of TSH it was found that patients diagnosed with diabetes mellitus had mean TSH levels of 3.3 ± 2.6 and controls had mean TSH levels of 3.2 ± 1.8 . On the assessment of FT4 levels it was found that patients diagnosed with diabetes mellitus had mean FT4 levels of 1.4 ± 1.1 and controls had mean FT4 levels of 1.5 ± 0.7 . (Table 1)

Table 1: Demographic variables of study participants

Parameters	Diabetes group	Control group
Age (Mean $\pm$ SD)	42 ± 5.6	37 ± 6.8
Male	59 %	56 %
Female	41 %	44 %
BMI (Kg/m ²)	29.1 ± 2.4	28.5 ± 3.1

In the present study, among total study participants it was found that, the prevalence of thyroid dysfunction among the type II diabetes group was 28% and among the control group was 16%. The prevalence of subclinical hypothyroidism among the among the type II diabetes group was 17% and control group was 11% ($p > 0.05$). The prevalence of Clinical Hypothyroidism among the among the type II diabetes group was 8% and control group was 4% ($p > 0.05$). The prevalence of subclinical hyperthyroidism among the among the type II diabetes group was 2% and control group was 1% ($p > 0.05$). The prevalence of Clinical hyperthyroidism among diabetes group was 1% (> 0.05) (Table 2).

Table 2: Distribution of types of Thyroid disorders among the study participants

Type of thyroid disorder	Diabetes group	Control group	p-value
Subclinical hypothyroidism	17%	11%	> 0.05
Clinical Hypothyroidism	8%	4%	> 0.05
Subclinical hyperthyroidism	2%	1 %	> 0.05
Clinical Hyperthyroidism	1%	0 %	> 0.05
Total	28%	16%	

DISCUSSION

Diabetes is a chronic disease in etiology and occurs when the pancreas does not produce enough amount of insulin or when there is resistance towards its action on the body. Among the non-communicable diseases, diabetes mellitus is rapidly increasing globally and affecting all the age groups. Thyroid disorders are reported in higher magnitude among general population, although its prevalence is not as high as prevalence of diabetes mellitus. Thyroid disorders are endocrine in nature as diabetes mellitus

and various studies were conducted to find out correlation between both the disorders (8).

In the present study we enrolled 100 patients of diabetes mellitus who were aged from 27 to 58 years. The mean age of the enrolled patients was 42 ± 5.6 years. In the present study we enrolled 100 healthy controls who were aged from 24 to 55 years. The mean age of the enrolled controls was 37 ± 6.8 years. Out of total patients diagnosed with diabetes mellitus 59% patients were male and 41% patients were females. Out of total healthy controls 56% were male and 44% were females. Similar results were obtained in a study conducted by Palma et al among diabetes mellitus patients and found that the prevalence of thyroid dysfunction was reported to be 15%. However, majority of cases they found were of subclinical hypothyroidism which is followed by clinical hypothyroidism (9). Similar results were obtained in a study conducted by Fremantle et al among diabetes mellitus patients and found that the prevalence of thyroid dysfunction was reported to be 9%. Majority of cases they found were of subclinical hypothyroidism which is followed by clinical hypothyroidism (10). Similar results were obtained in a study conducted by Chuet cols et al among diabetes mellitus patients and found that the prevalence of thyroid dysfunction was reported to be 9%. Majority of cases they found were of subclinical hypothyroidism which is followed by clinical hypothyroidism (11).

In the present study, on the assessment of BMI it was found that patients diagnosed with diabetes mellitus had mean BMI of 29.1 ± 2.4 and controls had mean BMI of 28.5 ± 3.1 . On the assessment of TSH it was found that patients diagnosed with diabetes mellitus had mean TSH levels of 3.3 ± 2.6 and controls had mean TSH levels of 3.2 ± 1.8 . On the assessment of FT4 levels it was found that patients diagnosed with diabetes mellitus had mean FT4 levels of 1.4 ± 1.1 and controls had mean FT4 levels of 1.5 ± 0.7 . Similar results were obtained in a study conducted by NHANES study among diabetes mellitus patients and found similar values of TSH and FT4 levels among diabetic patients (12). Similar results were obtained in a study conducted by Ramos AJS et al study among diabetes mellitus patients and found that the prevalence of thyroid dysfunction was reported to be 20%. Majority of cases they found were of subclinical hypothyroidism which is followed by clinical hypothyroidism (13).

In the present study, among total study participants it was found that, the prevalence of thyroid dysfunction among the type II diabetes group was 28% and among the control group was 16%. The prevalence of subclinical hypothyroidism among the among the type II diabetes group was 17% and control group was 11% ($p > 0.05$). The prevalence of Clinical Hypothyroidism among the among the type II diabetes group was 8% and control group was 4% ($p > 0.05$). The prevalence of subclinical hyperthyroidism among the among the type II diabetes group was 2% and control group was 1% ($p > 0.05$). The prevalence of Clinical hyperthyroidism among diabetes group was 1% (> 0.05). Similar results were obtained in a study conducted by Souza et al study among diabetes mellitus patients and found that the prevalence of thyroid dysfunction was reported to be 14%. Majority of cases they found were of subclinical hypothyroidism which is followed by clinical hypothyroidism (14).

CONCLUSION

We concluded from the present study that the patients of diabetes mellitus had higher prevalence of thyroid dysfunction in comparison to the healthy controls enrolled in the study. We found subclinical hypothyroidism was more common than clinical hypothyroidism; however this difference was statistically non-significant. Since present study had small sample size, therefore, further large studies required for generalization of study results.

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