Open Science Journal of Clinical Medicine
2015; 3(3): 98-102
Published online May 10, 2015 (http://www.openscienceonline.com/journal/osjcm)

Prevalence of Thyroid Dysfunction Among Type-2 Diabetes Patients in an Urban Diabetes Hospital, Bangladesh

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To cite this article

Fauzia Moslem, Tapasi Sarker Bithi, Animesh Biswas. Prevalence of Thyroid Dysfunction Among Type-2 Diabetes Patients in an Urban Diabetes Hospital, Bangladesh. *Open Science Journal of Clinical Medicine.* Vol. 3, No. 3, 2015, pp. 98-102.

Abstract

Introduction: Diabetes Mellitus (DM) is one of the leading endocrine disorders worldwide. Bangladesh has shown diabetes as a silent killer in adults. There is an established association between diabetes and thyroid disorder. The prevalence of thyroid disorders among diabetes patients is still not known. *Objectives:* To explore the prevalence of thyroid dysfunction among type-2 diabetes patients attending a specialist diabetes centre in urban Dhaka. *Methods:* A cross sectional study was performed. Two hundred and thirty two patients with type-2 diabetes mellitus came to the specialized diabetes centre between March and August 2014 and were enrolled for the study. All patients underwent a thyroid clinical and laboratory examination. *Results:* Prevalence rate of thyroid dysfunction was 10%. Females were found with higher rate of thyroid dysfunction (78.3%) with male (21.7%). The majority of the patients had diabetes for more than a five-year duration (52%). Patients aged between 41-50 years were found to be more affected with thyroid dysfunction (34.8%). *Conclusions:* The prevalence of thyroid disorder among female diabetes patients were higher. All patients had hypothyroidism. The approach of using a screen test to explore thyroid disorders was not effective, rather routine screening is recommended for all type 2 diabetes patients to reduce the burden of the disease.

Keywords

Type- 2 Diabetes, Thyroid Dysfunction, Hypothyroidism

1. Introduction

Diabetes mellitus is an epidemic and global burden of disease worldwide, with developing countries the highest risk [1]. DM and thyroid disorders are two of the most common endocrine conditions, which often occurs with each other [2, 3]. Association between both conditions have long been reported [4]. Studies reveals that hypothyroidism is the most commonly diagnosed thyroid dysfunction and has a greater implication for type-2 diabetes with a pre-existing dyslipidaemia and the risk of cardiovascular disease is increased [5,6].

Thyroid disease is a pathological state that adversely affects the diabetic control. Diabetes influences thyroid function in two sites, one of them is at the level of hypothalamic control of Thyroid Stimulating Hormone (TSH) release and another one is to conversion of Tertaiodothyronin (T4) to Triiodothyronin(T3) in the peripheral tissue [7]. A number of studies in different countries have identified the estimate of prevalence of thyroid dysfunction among diabetes patients [8]. One study showed the prevalence of thyroid dysfunction is higher in diabetics than in control group, estimation was between 10 to 15% in diabetes compared to 6% in the non-diabetic population [9]. Another study reported in Jordan that thyroid dysfunction was present in 12.5% of type 2 diabetic patients [10]. Prevalence of thyroid dysfunction was found in 16% of Saudi patients with type-2 diabetes have [11]. Another study in Greek diabetic patients showeda prevalence of thyroid disorder in 12.3% cases [8]. A Colorado Thyroid Disease Prevalence study enrolled 25,862 participants attending a state health fair, 9.5% of the studied population were found to have an elevated TSH, while 2.2% had a low TSH [12].

Type 2 DM is a growing problem in our country and clinical findings showed that many patients are associated with thyroid dysfunction later life. Considering the context in Bangladesh, we didn't find any studies to determine the prevalence of thyroid dysfunction in type 2 diabetic patients. Therefore, this study has looked at the prevalence of thyroid dysfunction among type 2 diabetes patients who visited a specialized diabetes hospital in urban Bangladesh.

2. Methods

We examined a total of 232 patients with type-2 DM attending the specialized diabetes centre, Jurain Shahtho Seba Kendra, BIHS between March and August 2014. Each patient was enrolled for the study. Diagnosis of diabetes was based on the American Diabetes Association and World Health Organization criteria. Patients with a history of previous visits to the center and having a treatment card provided from the hospital were enrolled in the study. Only known diagnosed type-2 diabetes was included. We have excluded patients who were not interested to enroll in delivering information. A medical history including age, sex, duration of diabetes, present diabetes conditions and medication records were obtained.

Patients were seen by a group of doctors consisting of an endocrinologist and diabetologist at the time of history taking, and at the time of treatment given, after clinical tests were conducted. All patients undertook a fasting blood sugar and two hours after meal, HbA1c, triglyceride and TSH measured with a highly sensitive immunoradiometric assay (IRMA) kit.

We counted TSH levels above 10 as hypothyroidism. 6.1-10 TSH levels were counted as a sub-clinical level. Blood samples were drawn after 10 to 12 hours of fasting. Informed written consent was taken from each of the patients before enrolling in the study. Statistical analysis was performed using programs available in the SPSS statistical package (SPSS 20.0, Chicago, USA). All variables were tested for normal distribution of the data. A descriptive analysis was performed.

3. Results

We have found 79.7% (n=185) of patients were female whereas 20.3% (n=47) were male. The majority of the patients were aged between 41-50 years (32%), with the mean age of the patients 45 years. We have found 10% (n=23) of the patients had hypothyroidism and another 9.5% (n=22) had sub-clinical conditions. Among hypothyroidism group, around 35% of the patients were in between 41-50 years of age group, whereas the lowest age group was 51-60 years (8.7%) [Figure-1]. 52% of the patients of hypothyroidism group had diabetes for more than five years [figure -2].

In this group, triglyceride was also found to be much higher, 78.3% had triglyceride for more than 150mg/dl [figure-3].

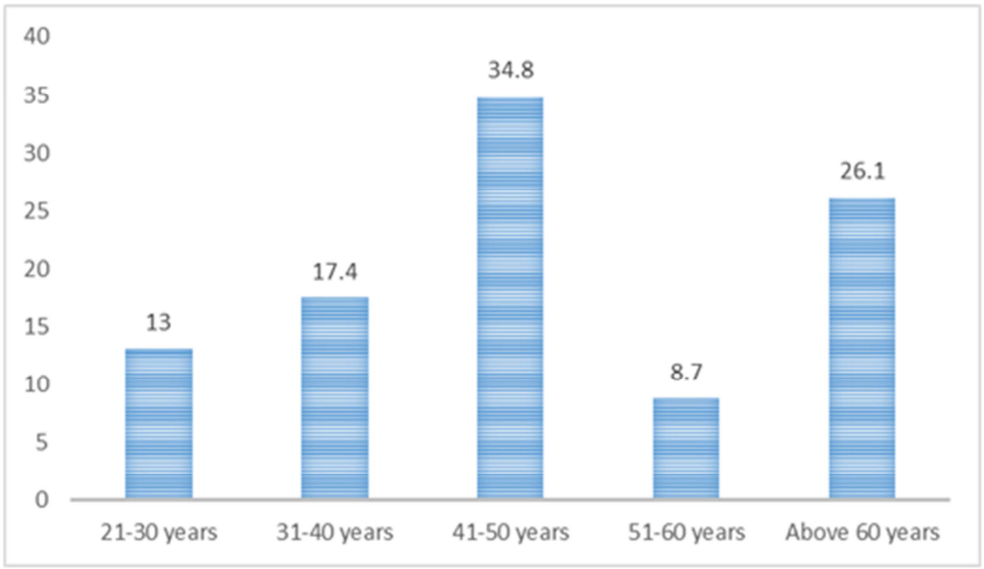

Figure 1. *Age group in thyroid dysfunction patients with type-2 diabetes.*

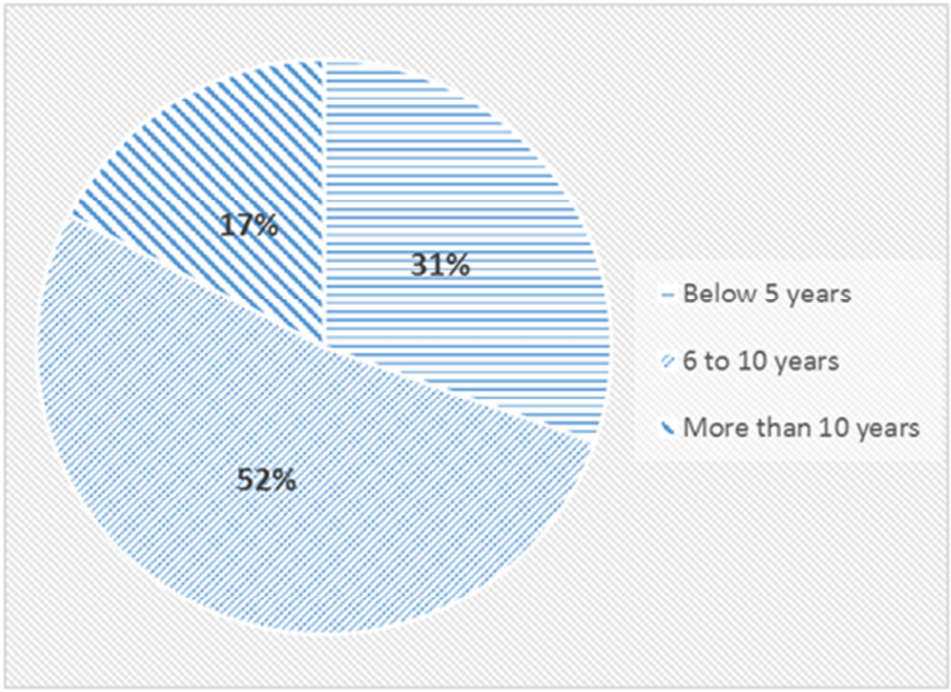

Figure 2. *Duration of type-2 diabetes.*

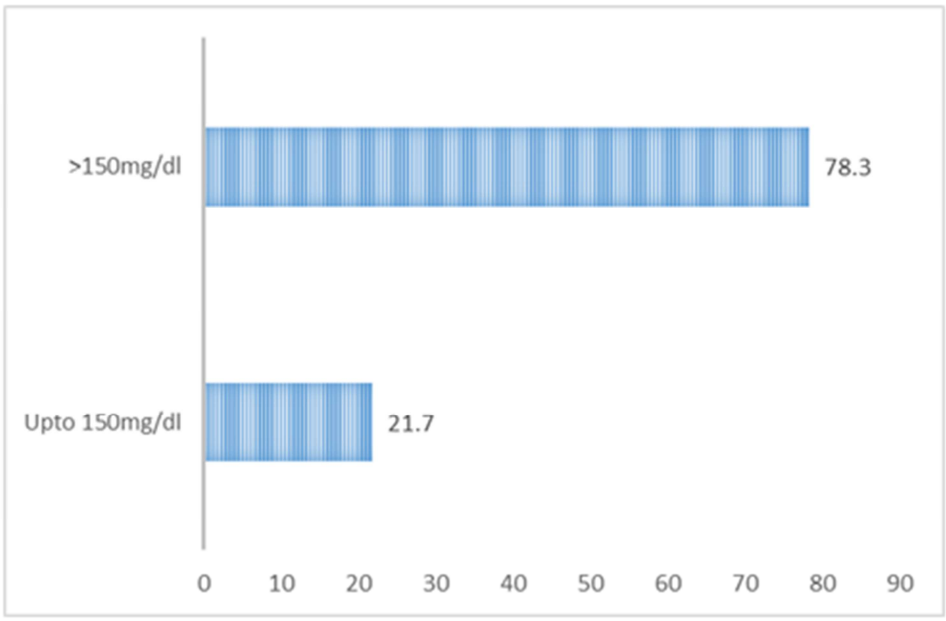

Figure 3. *Triglyceride level in thyroid dysfunction patients with type-2 diabetes.*

4. Discussions

The association between diabetes and thyroid dysfunction were first identified in 1979[8]. The current study shows that the prevalence rate of thyroid dysfunction was 10% in type 2 diabetes patients who attended a specialized diabetes hospital in Dhaka. This study relates with other studies showing prevalence rates similar to our results. One of the observational studies among three hundred eighty six patients showed that thyroid disorder was among 12% of type-2 diabetes patients [13]. Perros et al. in their study showed a prevalence thyroid disorder of 13.4% in diabetics' patients [14]. In Jordan by Radaideh et al. found the overall prevalence of thyroid disease in type 2 diabetes was 12.5%[10]. A Greek study also presented the prevalence of thyroid dysfunction in type 2 DM to be 12.3% [8]. Recent study in India showed 24% thyroid dysfunction among type-2 diabetes patients [15]. Whereas, prevalence was shown to be higher in another study conducted in Nigeria which was 29.7% among 64 type 2 diabetics' patients [16].

In our study, we enrolled only type-2 diabetes patients, although thyroid dysfunction is also found in type-1 diabetes in another study [17].

In our study 43.5% patients who had thyroid disorders were aged between 41-60 years. A study conducted in India showed that the maximum cases were of hypothyroidism seen in the age group between 45-64 years [18]. A study in Greece also showed higher thyroid dysfunction among females [8]. Another study revealed that the prevalence of subclinical hypothyroidism was 5.2%in males and 8.4% in females with type-2 diabetes [19]. A study in Nigeria also showed females were more affected with thyroid dysfunction than men [16]. Our study found that in majority of the cases there was raised TG level in thyroid disorder patients. While dyslipidemia is a reported complication of obvious hypothyroidism in non-diabetic and diabetic [20].

5. Limitations of the Study

The study has a certain limitations, among them sample size was small and difficult to interpret conclusions from the sample numbers. Patients were selected from a specialized diabetes centre where all patients coming to hospital with diabetes were already under diabetes treatment, which is to some extent a selection bias. The prevalence rate may be differing in different settings or hospital. The duration of the study was also restricted to six months; a one year data could provide better impressions. Some patients whom already had some knowledge of their thyroid function with some symptoms but not performed laboratory examination were included. We have only performed a TSH test to check thyroid function, considering cost of the investigation to perform other twos, T3 and T4.

6. Conclusions

We did not have articles related to the prevalence of thyroid dysfunction among type-2 diabetes patients in Bangladesh. This study has provided an impression on the present status and evidence from the article can be used to design a larger scale study to get the actual prevalence of thyroid dysfunction. Moreover, the approach of using TSH screening is not sufficient for thyroid dysfunction in type 2 diabetes patients, rather it demands for the routine screening for a thyroid function test in this group of patients for early diagnosis of thyroid disorder. This would allow early management in low income country settings like in Bangladesh.

Acknowledgment

We would like to acknowledge the patient's came to the hospital and willingly participated by providing information related to their diseases. We are also thankful to the hospital authority, especially to Ranzu Ahmed and Ashraful Haque Shaon for supporting the research and providing technical assistance during its implementation. Finally, we would like to thank Steve Wills of Royal National Lifeboat Institution (RNLI), United Kingdom for assistance with translation.

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