ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 10, Issue, 03, pp.67031-67034, March, 2018

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

PREVALENCE OF THYROID DYSFUNCTION IN PATIENTS OF TYPE 2 DIABETES MELLITUS: HOSPITAL BASED PROSPECTIVE STUDY

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ARTICLE INFO

Article History:
Received 22nd December, 2017
Received in revised form
04th January, 2018
Accepted 20th February, 2018
Published online 30th March, 2018

Key words:

Type 2 diabetes mellitus,
Hypothyroidism.

Abbrevations:

EU-Euthyroidism,
HYPO-hypothyroidism,
HYPER-hyperthyroidism and
SCH-subclinical hypothyroidism.

ABSTRACT

Background: Diabetes mellitus has become a major health problem worldwide. Through Various Studies it has been have found that diabetes and thyroid disorders mutually influence each other and both disorders tend to coexist. The aim of this was study was to find out the prevalence of thyroid dysfunction in patients with type 2 diabetes mellitus attending an outpatient department and medical wards of hamdard institute of medical sciences and research institute new Delhi.

Material and methods: The study was conducted on 300 patients of type 2 diabetes mellitus above 30 years of age. All the patients were evaluated for thyroid dysfunction by testing thyroid profile (T3, T4and TSH). The correlation of prevalence of thyroid dysfunction with gender distribution, age distribution, HbA1C was done. The observations and interpretations were recorded and results obtained were statistically analysed.

Results: It was found that prevalence of thyroid dysfunction was 17. 3% in diabetic patients, most common was subclinical hypothyroidism (9%). Thyroid dysfunction was found to be more in females 73. 1 %, as compared to males 26. 9%. There was significant association between prevalence of thyroid dysfunction with HbA1c.

Conclusion: On the basis of observations of this study it is recommended to routinely screen patients of diabetes for presence of thyroid disorders to prevent long term morbidity and mortality.

Citation: Setare Nassiri, Mohammad Vakili, Hamide Gholami and Setare Akhavan, 2018. "Prevalence of thyroid dysfunction in patients of type 2 diabetes mellitus: hospital based prospective study", *International Journal of Current Research*, 10, (03), 67031-67034.

INTRODUCTION

Diabetes mellitus (DM) and Thyroid disorders are two most common endocrinological disorders encountered in clinical practice (Feely and Isles, 1979; Gray and Irvine, 1979). Thyroid dysfunction and diabetes mellitus have been shown to mutually influence each other and association between both these conditions were first published in 1979 (Feely and Isles, 1979). The prevalence of thyroid dysfunction in type 2 diabetes mellitus (T2DM) was reported to be between 2. 2-17% (Vij *et al.,* 2012). However in few studies prevalence as high as 31% and 46. 5% respectively were also observed (Radaideh *et al.,* 2004). Thyroid hormones act as insulin antagonists and influence the action of insulin indirectly and probably results in low thyroid hormone status in diabetes mellitus (Celani *et al.,* 1994; Ramesh *et al.,* 2015). Thyroid hormones also have been found to regulate glucose homeostasis by means of various profound effects, including alteration of the circulating levels of insulin and counter regulatory hormone, intestinal absorption, hepatic production and the peripheral tissue uptake of glucose (Gabriela, 2011). In hypothyroidism, glucose induced insulin secretion by β-cells is reduced and also increased insulin resistance may influence metabolic changes (Duntas *et al.,* 2011; Rezzonico *et al.,* 2011). The recognition of this relationship between diabetes mellitus and thyroid disease is of the clinical importance for optimal management of both these conditions. This aim of study was to know the prevalence of thyroid dysfunction in patients of type 2 diabetes mellitus.

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MATERIALS AND METHODS

The study was conducted on 300 patients of type 2 diabetes mellitus above thirty years of age in the department of general medicine, Hamdard institute of medical sciences and research institute (HIMSR), New Delhi over a period of six months with effect from December 2017 to June 2017. Biochemical investigations were carried out using proper aseptic precautions. All type 2 diabetic patients were subjected to estimation of T3, T4, and TSH (by chemi-lumiscence assay method) And HbA1c after necessary consent. The results of

thyroid function were classified on the use of the following as normal reference range
TSH (0. 40- 5. 50 mIU/l),
T4 (8. 5-22 µg/dl)
T3(2. 8-7. 3 µg/dl).

Hypothyroidism when T3, T4 were less and TSH greater than the reference ranges. Hyperthyroidism when T3, T4 were greater and TSH less than the reference ranges.

Subclinical hypothyroidism when T3, T4 were within normal range and TSH greater than the reference ranges.

The P-value <0. 05 was considered significant. All the analysis was carried out on SPSS 16. 0 version (Chicago, inc, USA).

Inclusion criteria

- All patients with type 2 diabetes mellitus aged more than 30 years.
- All patients of type 2 diabetes mellitus irrespective of glucose control.
- All type 2 diabetic patients irrespective of treatment (OHA/insulin).

Exclusion criteria

- Type 1 diabetes mellitus patients
- Gestational diabetes
- Patients on Steroids
- Patients with pancreatitis
- Patients with CKD

RESULTS

In this study 300 established cases of type 2 diabetes more than 30 years of age were screened for thyroid dysfunction by means of throid function test. Out of 300 patients 176 were females and 124 were males (Table 1).

Table 1.

Male	124
Female	176
Total	300

The mean age among euthyroid and those with thyroid dysnction was respectively 48. 78±9. 37 and 47. 15± 7. 66 (Table 2, Fig 1). The Association of prevalence of thyroid dysfunction with age of the patient was not significant (P value 0. 241(>0. 05). Thyroid dysfunction was found in 17. 3% of diabetic patients (Table 2 and Fig 1). Most common thyroid disorder found was Subclinical hypothyroidism (9. 0 %) followed by hypothyroidism (6. 0%) which was followed by hyperthyroidism (2. 3%) (Table 3, Fig 2). Prevalence of thyroid disorders was found to be more in females (73. 1%) as compared to males (26. 9 %). P value (0. 020) (Table 5, Fig 4). Sex distribution of thyroid dysfunction in type 2 diabetes. Hypothyroidism, hyperthyroidism and subclinical hypothyroidism was more prevalent in females compared to males (P value <0. 001) (Table 6, Fig 5). In our study the prevalence of thyroid dysfunction was found to be more in patients with HbA1c more than 8 as compared to those of euthyroid patients with HbA1c less than 8 (Table 7, Fig 6.).

Table 2.

	EU	Thyroid Dysfunction	P Value
	Mean ± SD	Mean ± SD	
Age	48.78 ± 9.37	47.15 ± 7.66	0.241*

*NS=Not significant

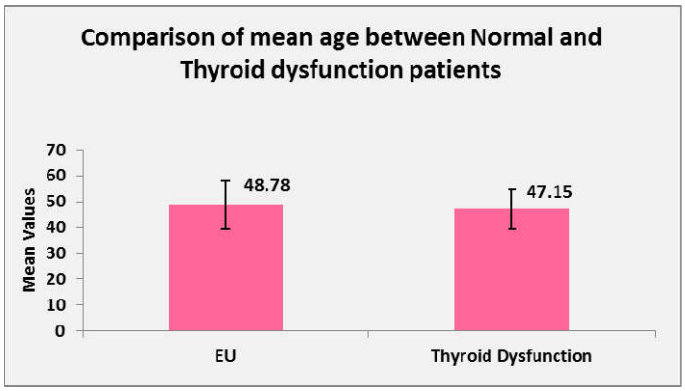

Fig. 1.

Table 3.

Groups	Frequency	%
EU	248	82.7%
Thyroid Dysfunction	52	17.3%
Total	300	100%

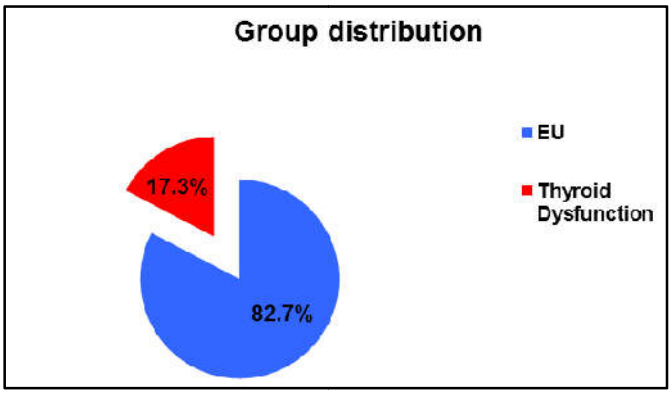

Fig. 2.

Table 4.

Groups	Frequency	%
EU	248	82.7%
HYPO	18	6.0%
HYPER	7	2.3%
SCH	27	9.0%
Total	300	100%

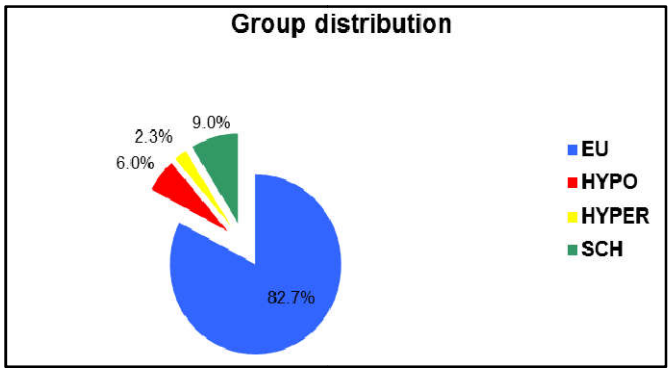

Fig. 3.

Table 5.

Sex	EU		Thyroid Dysfunction		P Value
	Frequency	%	Frequency	%	
F	138	55.6%	38	73.1%	0.020**
M	110	44.4%	14	26.9%	
Total	248	100%	52	100%	

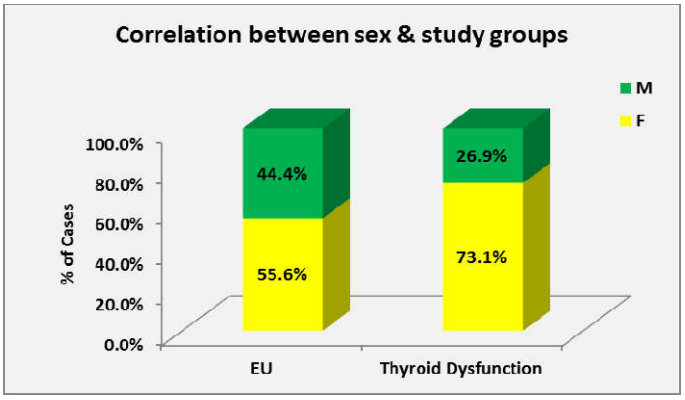

Fig. 4.

Table 6.

Sex	Groups				P Value
	EU Frequency (%)	HYPO Frequency (%)	HYPER Frequency (%)	SCH Frequency (%)	
F	138 (55.6%)	15 (83.3%)	4 (57.1%)	19 (70.4%)	<0.001**
M	110 (44.4%)	3 (16.7%)	3 (42.9%)	8 (29.6%)	
Total	248 (100%)	18 (100%)	7 (100%)	27 (100%)	

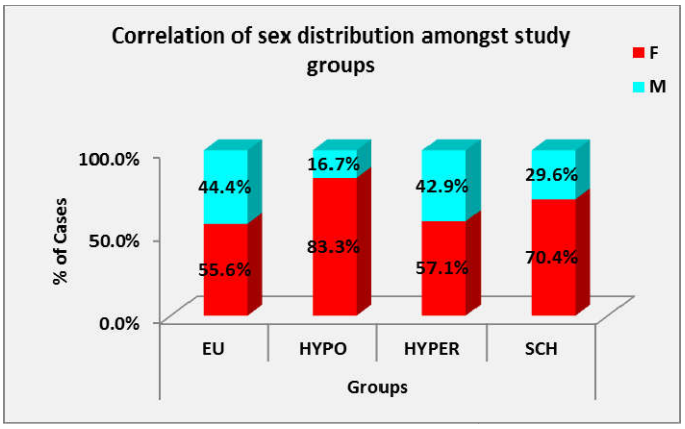

Fig. 5.

Table 7.

	EU	Thyroid Dysfunction	P Value
	Mean ± SD	Mean ± SD	
HbA1c	7.38 ± 0.53	10.37 ± 1.74	<0.001**

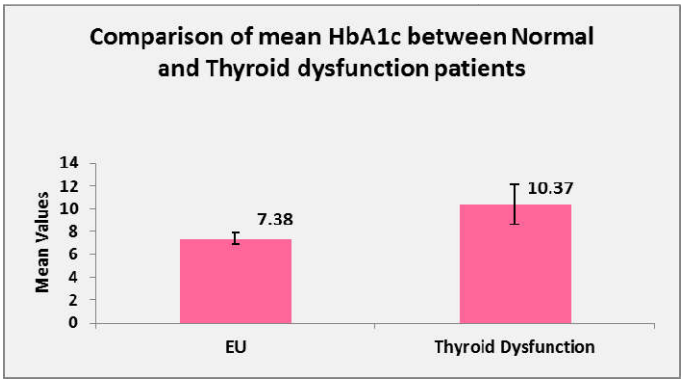

Fig. 6.

DISCUSSION

In our study, out of 300 patients, 52 patients (17. 3 %) had thyroid dysfinction and 248 (82. 7%) patients were found to be euthyroid. The findings of our study are consistent with an indiansudy done by Dr. Anuradha Deurietal, July 2016 (22. 5%) (Anuradha Deurietal, 2016). Another Indian study by Ravishankar *et al.,* 2013 revealed prevalence of 29% of thyroid dysfunction among type 2 diabetics. The findings of our study are consistent with Nobre *et al.,* 2008 (Prevalence of thyroid disorder was 12. 7%), Papazafiropoulouetal, 2010 (overall prevalence of throid dysfunction was 12. 3%) and Radaiedeh etal[14] (prevalence of thhroid dysfunction was 12. 5%). In our study subclinical hypothyroidism was most prevalent disorder occurring in 9% of diabetic patients, followed by hypothyroidism 6% and hyperthyroidism in 2. 3%. Thus in our study maximum prevalence was found to be of subclinical hypothyroidism where as hyperthyroidism was least found. Our results are consistent with Radaiedeh *et al.,* 2004, Babu *et al.,* 2001, Chubb *et al.,* 2005, Nobre *et al.,* 2008, Celani *et al.,* 1994, Perros *et al.,* 1995.

In our study the prevalence of thyroid disorder was more in females as compared to males (73. 1%vs 26. 9%) which was statistically significant (Fig 5, P value <0. 05). The results of our study are concordant with studies of Michaleketal, 2000, Babu *et al.,* 2001, Pimenta *et al.,* 2005, Vondra *et al.,* 2005, Celani *et al*, 1994 and Papazafiropoulouetal, 2010 in which thery all reported prevalence of thyroid dysfunction higher in diabetic females as compared to diabetic males. Thus in diabetic patients high prevalence of thyroid disorders is strongly influenced by female gender. Results of our study have denied that age is asignificant risk factor for thyroid dysfunction (P value= 0. 241) as with what has been reported by different studies (Díez *et al.,* 2011; Hajieh *et al.,* 2011). Similarly the study carried by MetabAl- geffari *et al.,* 2013 found no significant relationship between prevalence of thyroid dysfunction and age. In our study out of 52 diabetic patients who had thyroid dysfunction the mean HbA1c (10. 37 ±1. 34) was significantly higher (P value <0. 001) as compared to Euthyroid diabetic patients with mean HbA1C (7. 38± 0. 53). Thus clearly from our study thyroid dysfunction was more among patients with high HbA1c level as compared to those with low HbA1c. Our results are comparable to various previously conducted studies where Ardekani *et al.,* 2010 found HbA1c significantly higher in diabetic patients having thyroid disorder as compared to euthyroid patients (8. 9±1. 99 VS 7. 11±1. 02, P value =0. 001). Similarly Bazrafshan *et al.,* 2000 found significant positive correlation between HbA1c and TSH level (p value <0. 01).

Conclusion

Higher prevalence of thyroid dysfunction in patients of type 2 diabetes mellitus, most common being subclinical hypothyroidism, more common in females and in those with poor glycemic controls(high HbA1c) makes it mandatory to regularly screen patients of type 2 diabetes mellitus for thyroid dysfunction so as to guide clinicians on the optimal management of both these conditions.

REFERENCES

Feely, J., Isles, T.E. 1979. Screening for thyroid dysfunction in diabetics. *Br Med J.,* 1 (6179):1678.

Gray, R.S., Irvine, W.J., Clarke B.F. 1979. Screening for thyroid dysfunction in diabetics. *Br Med.,* 2(6202):1439.

Vij, V., Chitnis, P., Gupta, V.K. 2012. Evaluation of thyroid dysfunction among type II diabetic patients. *IJPBS*, 2(4):150-5.

Radaideh, A.R., Nusier, M.K., Amari, F.L., Bateiha, A.E., El-Khateeb, M.P., Naser, P.A., *et al*. 2004. Thyroid dysfunction in patients with type 2 diabetes mellitus in Jordan. *Saudi Med J.,* 25(8):1046-50.

Celani, M.F., Bonati, M.E., Stucci, N. 1994. Prevalence of abnormal thyrotropin concentrations measured by a sensitive assay in patients with type 2 diabetes mellitus. *J Diabetes Res.,* 27:15-25.

Ramesh, V., Geetha, R., Anitha, D., Swamy, N.RV.K., Panneerselvam, T.T. 2015. The study of thyroid dysfunction among type 2 diabetic patients. *Int J Curr Ris Aca Rev.,* 3(9):17. 7.

Gabriela B. 2011. A view of diabetes from thyroid corner. Thyroid Int. 2011;3:2-15.

Duntas, L.H., Orgiazzi, J., Brabant, G. 2011. The interface between thyroid and diabetes mellitus. *Clin Endocrinol.,* 75(1):1-9. 9.

Rezzonico, J., Niepomniszcze, H., Rezzonico, M., Pusiol, E., Alberto, M., Brenta, G. 2011. The association of insulin resistance with subclinical thyrotoxicosis. *Thyroid*., 21(9):945-9.

Dr AnuradhaDeurietal, 2016. (22. 5%)[1] :Prospective study of thyroid dysfunction in patients with Type 2 diabetes mellitus in a tertiary care hospital, assamindia. *IOSR Journal of Dental and Medical Sciences*, volume 15, issue 7 ver. Ii, pp21-25).

Ravishankar, S. N., Champakamalini, Venkatesh, 2013. Mohsin Aprospective: study of thyroid dysfunction in patients with Type 2 diabetes mellitus in general population. *Archives of Medicine,* vol. 5 no. 1. 2 doi :10. 3823/105

Nobre, E.L., Jorge, Z., Pratas, S. *et al*. 2008. Profile of the thyroid function in a population with type-2 diabetes mellitus. *Endocrine Abstracts,* 3: p298

Papazafiropoulou, A., Sotiropoulos, A., Kokolaki, A. *et al*. 2010. Prevalence of thyroid dysfunction among greek type 2 diabetic patients attending an outpatient clinic. *J Clinical Medicine Research,* 2 (2): 75-8. 5.

Radaiedeh, A.R., Nusier, M.K., Aar, F.L. *et al*. 2004. Thyroid dysfunction in patients with type 2 diabetes mellitus in Jordan. *Saudi Med J.,* 25 (8): 1046-50.

Babu, K., Kakar, A., Byotra, S.P. 2001. Prevalence of thyroid disorder in type II diabetes mellitus patients. *J AssocPhys Ind.,* 49: 43.

Chubb, S.A., Davis, W.A., Inman, Z. 2005. Prevalence and progression of subclinical hypothyroidism in women with type 2 diabetes: the Fremantle Diabetes Study. *Clin Endocrinol (Oxf),* 62: 480-6

Celani, M.F., Bonati, M.E., Stucci, N. 1994. Prevalence of abnormal thyrotropin concentrations measured by a sensitive assay in patients with type 2 diabetes mellitus. *Diabetes Res.,* 27 (1): 15-25.

Perros, P., McCrimmon, R.J., Shaw, G., Frier, B.M. 1995. Frequency of thyroid dysfunction in diabetic patients: value of annual screening. *Diabet Med.,* 12 (7): 622-7

Michalek, A.M., Mahoney, M.C, Calebaugh, D. 2000. Hypothyroidism and diabetes mellitus in an American Indian population. *J Family Practice,* 49 (7): 53-5

Pimenta, W.P., Mazeto, G.M., Callegaro, C.F. *et al*. 2005. Thyroid disorders in diabetic patients. *Arq Bras Endocrinol Metab.,* 49 (2)

Vondra, K., Vrbikova, J., Dvorakova, K. 2005. Thyroid gland diseases in adult patients with diabetes mellitus. *Minerva Endocrinol.,* 30: 217-36.

Díez, J. J., P. Sánchez, and P. Iglesias, 2011. "Prevalence of thyroid dysfunction in patients with type 2 diabetes," *Experimental and Clinical Endocrinology and Diabetes,* vol. 119, no. 4, pp. 201–207.

Hajieh, S., M. Behbahani, and A. Z. Mohtashami, 2011. "Prevalence of thyroid dysfunction and thyroid auto antibodies in type 2 diabetic patients," *Pakistan Journal of Medical Sciences,* vol. 27, no. 5, pp. 1169–1172.

Metab Al-Geffarietal, 2013. Prevalence of thyroid dysfunction among type 2 diabetic patients in a highly diabetes mellitus prevalent society," *International Journal of Endocrinology,* volume, Article ID 417920,6 pages.

Ardekani, M.A., Rashidi, M., Shojaoddiny, A. 2010. Effect of thyroid dysfunction on metabolic response in type 2 diabetic patients. *Iranian J Diabetes And Obesity.,* 2(1).

Bazrafshan, H.R., Ramezani, A., Salehi, A. *et al*. 2000. Thyroid dysfunction and its relation with diabetes mellitus (NIDDM). *J GarganUniv Medical Sciences,* 2(5): 5-11.

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