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Research Article

**OCCURRENCE OF THE THYROID DYSFUNCTION AND  
AUTOIMMUNITY OF THYROID AMONG PATIENTS  
SUFFERING FROM TYPE-2 DIABETES**<sup>1</sup>Dr Anum Mehreen, <sup>2</sup>Dr Mubasit, <sup>3</sup>Dr Ali Shan Liaqat<sup>1</sup>Islamic International Medical College Rawalpindi, <sup>2</sup>RHC Jallahjeem Tehsil Mailsi District Vehari, <sup>3</sup>Medical Officer DHQ Hospital Gujrat

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**Abstract:**

**Objective:** This research work aimed to examine the occurrence of association between the thyroid dysfunction & thyroid auto-antibodies with the Type-2 DM (Diabetes Mellitus).

**Methodology:** Total 600 patients who were suffering from Type-2 diabetes visiting the Benazir Bhutto Hospital Rawalpindi were the part of this research work. We carried out the screening of these patients for T-3, T-4, T-3RU, HbA1c, TSH, and Anti-TPO Ab & Anti-TG A. The other variables included age of the patient, sex of the patient & medicines for lowering the sugar in blood.

**Results:** Approximately, 18% patients were available with 1 type of the dysfunction of thyroid: sub-clinical and/or clinical hypothyroidism & sub-clinical to explicit hyperthyroidism which were present with strong association with the gender but no association with the age of the patients. We also observed the higher levels of anti-TPO Ab & anti-TG Ab present in 31.88% & 30.68% patients, correspondingly.

**Conclusion:** Because of the high occurrence of the dysfunction of thyroid & thyroid autoimmunity in the patients suffering from Type-2 diabetes, we recommend for all the patients of Type-2 DM to undergo yearly screening with the help of the measurement of TSH in serum.

**Keywords:** Diabetes, Explicit, Hyperthyroidism, Thyroid, Autoimmunity, Approximately, Correspondingly, Dysfunction.

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**INTRODUCTION:**

Diabetes is a complication due to the high level of the sugar of blood due to the deficiency of the production of the insulin by the pancreas. The abnormality in the endocrine system is the main reason behind the diabetes mellitus & disorders of thyroid. The main contributors of the metabolism of cell are the insulin & hormones of thyroid together; there is heavy effect of these on each other with the rise or reduction of the each. The research works have described that DM & diseases of thyroid are normally occurring together. The disorder of thyroid are very common in the patients of Type-2 diabetes because both of these complications are more common in the elder patients. The disorders of thyroid has the ability to hinder the control of the sugar of blood in the patients suffering from diabetes. Hypothyroidism has the ability to reduce the proportion of the insulin needed in the patients of diabetes & hyperthyroidism can depreciate the tolerance of glucose or control of glucose.

Unidentified hypothyroidism is the cause of the recurring outbreaks of hypoglycemia as there is decrease in the synthesis & insulin release and because of the decreased gluconeogenesis, there is also decreased frequency of the released glucose from the liver and in a consequence, there is influence on the control of the metabolism of the body. In the problem of hyperthyroidism, there is an increase in the absorption by intestines & glycogen-lysis and it can cause the occurrence of the hyperglycemia. In opposition to the hypothyroidism, the hyperthyroidism has association with the high release in the hormone of growth & glucocorticoids, therefore, this can have influence on the homeostasis of glucose. The complications of thyroid may be unidentified in the patients of diabetes because their similar symptoms as well as signs are just same to the signs and symptoms of the diabetics.

Not controllable diabetes mellitus, either Type-1 or Type-2, may cause a low T-3 so that the sum of T-3 & free T-3 will reduce & reverse T-3 will rise but the level of TSH & T-4 will remain normal. In some research works, the incidence of the thyroid abnormalities in the patients of Type-2 diabetes is from 10.48% to 17.0%. Due to the high occurrence of the thyroid complications in the patients of diabetes, we conducted this research work to evaluate the thyroid dysfunction & thyroid autoimmunity in the patients suffering from Typ-2 diabetes in the population of our country, Pakistan.

**METHODOLOGY:**

There were 600 patients of Type-2 diabetes were the part of this descriptive research work which conducted in the Benazir Bhutto Hospital Rawalpindi from 2016 to 2018. The data about the demography of the patients is available in Table-1. All the patients completed a questionnaire comprising the information about the various variables as gender, age, diabetes type & medicine type which was in use. The measurements of the levels of T-4, T-3 & T-3RU in the samples of fasting blood carried out with the help of Gama counter instrument with the utilization of the immunothec kit and method of RIA & TSH of serum with the IRMA procedure and the level of the HbA1c by the Hb Gold apparatus with the usage of the method of Liquid Chromatography and the measurement of the levels of Anti-TPO and Anti-TG carried out with the use of Gama-counter & similar Kit & method of RIA. Chi-square method, T-test or ANOVA methods were in use for the analysis of the collected information.

**RESULTS:**

There were total 400 male patients and 200 female patients with an average age of  $47.79 \pm 9.38$  years as presented in Table-1.

**Table-I: Absolute And Relative Frequency Of Demographic Variables Of The Studied Patients**

Variable		Frequency	
Name	Categories	No	Percent
Gender	Male	400.0	60.69
	Female	200.0	35.28
	Total	600.0	95.97
Age (years)	< 30	20.0	3.78
	28-37	100.0	14.00
	38-47	180.0	32.18
	48-57	200.0	24.88
	> 60	100.0	17.18
	Total	600.0	92.00
Consumed blood lowering drug	Metformin	100.0	15.28
	Sulfonylurea	210.0	26.28
	Insulin	90.0	12.00
	Combined drugs	200.0	28.38
	Total	600.0	81.94

In the population of study, 18.38% patients were present with thyroid dysfunction comprising 5.78% sub clinical hypothyroidism, 3.48% hypothyroidism, 3.18% sub-clinical hyperthyroidism and 1.78% hyperthyroidism. The distribution of the relative & absolute frequencies of the condition of the function of thyroid in the patients of diabetes in accordance with the gender is present in Table-2. The rate of occurrence of the thyroid dysfunction was 21.48% in the female patients & 13.0% in the male patients.

We found no important association between the dysfunction of the thyroid and patient's age. Additionally, we identified no important association between this complication of dysfunction of thyroid & type of the drug used for lowering the glucose of the blood. Very high levels of Anti-TPO Ab & Anti-TG Ab were present in the 31.88% & 30.68% patients of Type-2 diabetes correspondingly but we found no important association with the gender of the patients. There was no association between the dysfunction of the thyroid and the level of HbA1c.

**Table-II: Absolute and Relative Frequency Gender Distributions of Thyroid Functional Status in Diabetic Patients**

Thyroid status	Hyperthyroidism		Hypothyroidism Subclinical		Hypothyroidism		Subclinical Hyperthyroidism		Normal		Total	
	No	%	No	%	No	%	No	%	No	%	No	%
Males	6	2.4	10	3.7	13	2.7	9	3.4	20	83	400	98
Females	5	1.2	31	4.2	47	7.3	30	4.2	29	74.3	200	96
Both Genders	11	2	41	5	60	8	39	5	49	80	600	97

### DISCUSSION:

The occurrence of the thyroid dysfunction was 18.38% in this research work which is much higher as compared to the other research works. Thyroid complications are very frequent in the normal public and its relative rate is from 4.58% to 9.68%. There is an acknowledged association between thyroid disorders and the patients of diabetes due to the high incidence of the involvement of the thyroid. Radaidah in his research work reported the occurrence of the thyroid dysfunction in 12.50% patients suffering from Type-2 diabetes. Nobre EL stated 12.70% dysfunction in diabetic patients from Portugal. The occurrence was 16.0% in the research work of Achar DH conducted in UAE. Matej Kova reported the occurrence as 19.0% in the patients of DM. The disparities in the findings of various research works is because of the variation in the size of sample, race differences, the region, age of the patients & gender of the subjects.

In the current research work, the incidence of the thyroid dysfunction was 5.78% sub-clinical hypothyroidism, 3.48% hypothyroidism, 3.18% sub-clinical hyperthyroidism & 1.78% hyperthyroidism

correspondingly, several studies of the past gave the similar results. We found no clear strong relationship between the gender of patients with the sex and thyroid dysfunction (21.48% females versus 13.0% males) which is also very similar with the studies of the past. In this research work, we discovered no association between the patient's age & thyroid diseases which is similar to other research work. Some possible causes for the disparity are different sizes of the sample population, race differences, geographical regions, gender & age of the patients under study. There was no relationship between the drug utilized for the lowering of the glucose of blood and dysfunction of thyroid. We also discovered no strong association between level of HbA1c & dysfunction of thyroid which was comparable with the findings of other research works.

In current research work, the ratio of anti-antibodies of thyroid (Anti-TPO & Anti-TG) were 31.88% & 30.68% correspondingly, which were very high as compared to other research works. This issue was also because of the disparities in the race, region, gender & age of the studied population as well as usage of the

iodine salts in our country which can lead to the diseases of the thyroid autoimmunity. The high rate of the abnormalities was present in female patients. In current research work, we did not evaluate the impact of the dysfunction of thyroid on the profile of lipid and relationship of the complications with the delayed anomalies of the DM. There is need of such research works in future to overcome these short-comings.

### CONCLUSION:

The outcome of this research work showed that there is very high occurrence (18.38%) of the thyroid dysfunctions in the patients of Typ-2 diabetes especially among females. The high occurrence of the anti-thyroid antibodies in the patients of Type-2 diabetes showed the possible incidence of thyroid dysfunction in nearly future among these patients. So, this is vital to carry out screening of the patients suffering from Type-2 diabetes particularly females annually for measurement of serum TSH for the dysfunction of thyroid.

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