CORRELATION BETWEEN GENDER AND HBA1C OF DIABETIC PATIENTS WITH THYROID DYSFUNCTION

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ABSTRACT

The thyroid gland secretes thyroid hormones, which are involved in controlling metabolism, growth, and development. They also affect the heart, muscles, and digestive system. Numerous health issues can result from thyroid dysfunction, including diabetes, dementia, and obesity. The data of 83 diabetic patients were obtained from the Endocrine and Diabetic Center Zliten (2023). The result showed that, the HbA1c and sex has a correlation of (0.021), the HbA1c and TSH has a correlation of (0.515), indicating that the relationship is not significant , and the HbA1c and age has a correlation of (0.439), suggesting that there is a weak relationship. The study concluded that there is no significant relationship between gender and HbA1c of diabetic patients with thyroid dysfunction.

Keywords: *Diabetes, Endocrine, HbA1c, Metabolism, Thyroid.*

1-INTRODUCTION

The thyroid is a highly vascular, brownish-red gland that is located anteriorly in the lower neck. It reaches the first thoracic vertebra from the level of the fifth cervical vertebra, thyroid hormones are stored inside the thyroglobulin molecule by many follicular cells within the thyroid gland until the body needs them[1]. Almost all of the body's cells are impacted by the thyroid hormones, which are also known as the primary metabolic hormones[2]. Thyroxine (T4) and triiodothyronine (T3) are two of the most powerful hormones produced by the thyroid and released into the bloodstream[3] These hormones affect the body's basic metabolic processes or increase oxygen consumption in almost every tissue[4]. Thyroid hormones also affect dentition, bone development, neural development,

linear growth, and brain function, including memory and intelligence[5]. The thyroid gland uses iodide acquired from food or the metabolism of thyroid hormones and other iodinated chemicals to create T4 and T3[6]. To produce enough thyroid hormone, an individual needs to consume approximately 100 micrograms of iodide every day[6]. Nearly every organ in the body, including the heart, is impacted by thyroid hormones[7]. body mood, muscle strength, body temperature, and weight are all under their control[8]. the pituitary gland, an organ in the brain, regulates the thyroid. the pituitary gland secretes thyroid-stimulating hormone (TSH)[9]. tsh shows how much thyroid hormone it should produce[10]. If the thyroid hormone levels in the blood are too low, the pituitary gland will produce more thyroid-stimulating hormone (TSH) to force the thyroid to function harder[11]. the pituitary gland produces little or no tsh when thyroid hormone levels are very high[12]. Hyperthyroidism (too much thyroid hormone) is having more thyroid hormones than the body needs speeds up body functions, hypothyroidism, or too little thyroid hormone[13]. TSH screening is a standard procedure used to determine if newborns have congenital hypothyroidism, or hypothyroidism after birth[14]. TSH secreted by the pituitary is then affected by the factor that releases energy[15]. Thyroid dysfunction affects 17–30% of patient with type I diabetes, which is an elevated occurrence[16]. In people with type 1 diabetes, thyroid dysfunction may affect insulin sensitivity and insulin needs, glycated hemoglobin, which is created when hemoglobin mixes with glucose, is referred to as HbA1c, thyroid hormones are produced by the thyroid gland in response to the anterior pituitary glands thyroid-stimulating hormone (TSH)[17]. According to estimates from the World Health Organization (WHO) there are currently 19.4 million cases of type I diabetes worldwide

by 2025, that number is predicted to increase to roughly 57.2 million cases. Based on approximations, the Kingdom of Saudi Arabia's T1DM incidence in 2018 was approximately 33.5 cases per 100,000 samples, or 0.0335% of cases total, the increasing knowledge of the pathophysiology of diabetes is helping in the development of novel drugs to treat the range of these issues[18]. Women were more likely to experience thyroid dysfunction, and it was linked to significant risk factors like dyslipidemia, retinopathy, low glycemic status (HbA1c ≥7), and longer diabetes duration[19]. Patients with type 2 diabetes should often have screenings for concurrent illnesses such as thyroid problems in addition to their glycemic state, an examination known as the hemoglobin A1c (HbA1c) test establishes the mean glucose (sugar) level throughout the preceding two to three months[20]. An A1c test measures the percentage of red blood cells that have hemoglobin coated with glucose, since glucose binds to hemoglobin for the duration that red blood cells are active, the results of an A1C test can indicate the average blood sugar level over the preceding three months, red blood cells have a 120-day lifespan on average[21]. If a patient exhibits any of the following diabetes symptoms, they may additionally require an A1c test, frequent urination (peeing), spontaneous weight loss, intense hunger, hazy vision, tingling or numbness in the hands or feet, exhaustion, dry skin, sores that heal slowly, and an increased risk of infections are some of the symptoms that may be present[22]. Diabetes is defined as an A1c of 6.5% or above. Sugar levels rise as a result of hyperthyroidism's increased metabolism, which speeds up the removal of insulin[23]. This may make diabetes more likely to occur or more difficult to manage. Low sugar can result from hypothyroidism, thyroid dysregulation is associated with a number of disease disorders and impacts different cellular systems[24]. In particular,

hypothyroidism is considered to be a significant contributing factor, to a number of neurological issues affecting the central nervous system, including metabolic illness, depression, and dementia. Recent research on the impact of thyroid disease on insulin has shown how hypothyroidism, brain insulin resistance, and dyslipidemia are connected, ultimately resulting in diabetes-associated dementia[25].

2-MATERIAL AND METHODS

Research Design

This study was designed using a descriptive survey methodology.

The Sample of Study

The respondent to the study was eighty-three adult diabetic patients with thyroid dysfunction from the Endocrine and Diabetic Center in Zliten (2023).

Procedure

The data included age, sex, HbA1c, and TSH values were gathered from the Endocrine and Diabetes Center's laboratory in Zliten.

Ethics of Study

Permission to conduct a study was first sought and given by the center administrators. The participants' approval was obtained, and the approval to collect the sample from the center was granted.

Statistical analysis

The data obtained from the Endocrine and Diabetic Center Zliten (2023) were analyzed by SPSS (version 25) statistical software.

3-RESULTS

The number of males in the research sample is 38 cases (45.8%), while the number of females is 45 cases (54.2%), as shown figure 1.

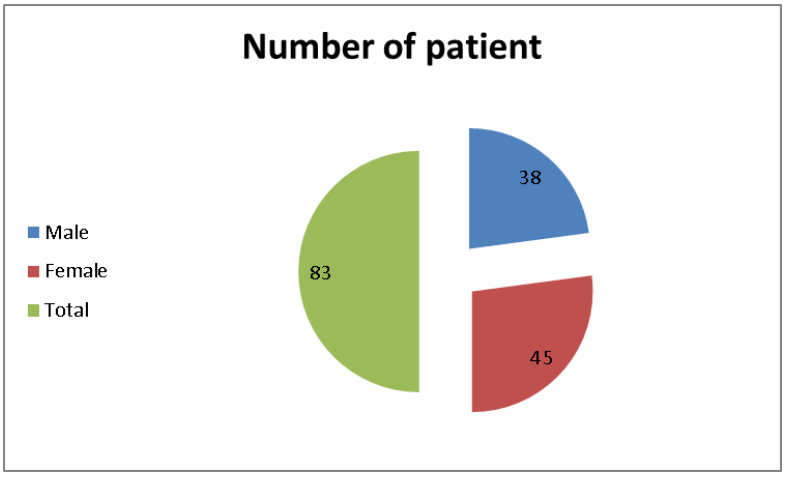

Figure 1, number of patient

2-The number of cases with a normal HbA1c rate is 31 cases, (37.3%), while the abnormal rate is 52 cases (62.7 %) as shown figure 2.

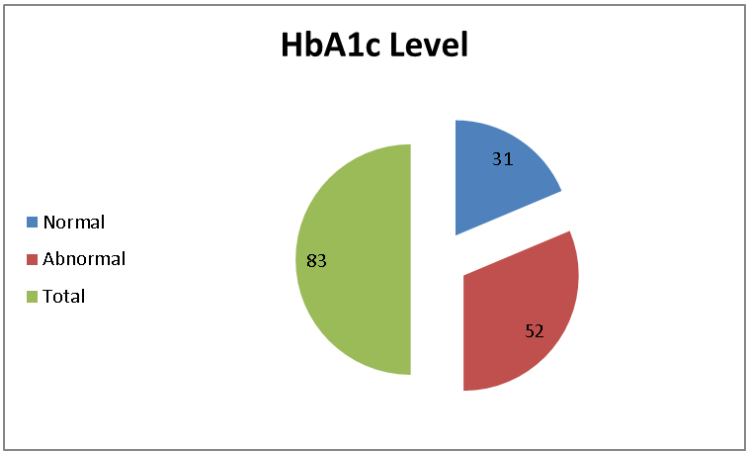

Figure 2.level of HbA1c

3-The number of cases with hyperthyroidism is 2 cases (2.4 %), and the number of hypothyroidism in the sample is 9 cases (10.8%) while most of the cases have normal thyroid function , as shown in figure 3.

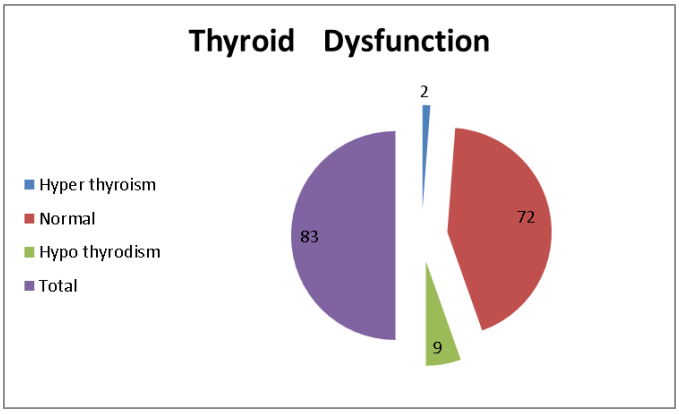

Figure 3 thyroid dysfunction

4- The correlation between the HbA1c and sex was found to be very weak (r^2=0.021). In addition, the correlation between the HbA1c and thyroid stimulating hormone (TSH) was found (r^2=0.515), indicating that there is weak relationship. Furthermore, the correlation between the HbA1c and age is equal to (r^2=0.439), indicating that there is a weak relationship.

TABLE 1 CORRELATION COEFFICIENT

Correlation coefficient			
	TSH	**Age**	**Sex**
HbA1c	**0.515**	**0.439**	**0.021**

4-DISCUSSION

Hyperthyroidism (too much thyroid hormone) is having more thyroid hormones than the body needs speeds up body functions, hypothyroidism,

or too little thyroid hormone[13]. TSH secreted by the pituitary is then affected by the factor that releases energy, diabetes can result from any disturbance of this hormone, patient exhibits any of the following diabetes symptoms, they may additionally require an A1c test[14]. Frequent urination (peeing), spontaneous weight loss, intense hunger, hazy vision, tingling or numbness in the hands or feet, exhaustion, dry skin, sores that heal slowly, and an increased risk of infections are some of the symptoms that may be present[14]. Statistical analysis showed that significant association between poor glycemic control and thyroid dysfunction. In contrast to the study, they concluded that thyroid disorders are uncommon in patients with uncontrolled type 2 diabetes mellitus, while in this study there is no correlation between the HbA1c and sex.

4-CONCLUSION

The study concluded that there is no significant correlation between gender and HbA1c of diabetic patients with thyroid dysfunction.

5- RECOMMENDATION

1- Frequent evaluation for thyroid issues, given that individuals with type 1 diabetes are more likely to experience thyroid dysfunction, this is particularly crucial for them.

2- Close monitoring of sugar levels. thyroid dysfunction can make it more difficult to control sugar levels, so it is important to monitor your sugar levels regularly

3- Adjustment of diabetes medications as needed. thyroid dysfunction can affect how the body metabolizes diabetes medications, so it may be necessary to adjust diabetes medications as needed.

4- Thyroid dysfunction treatment. this is necessary to minimize the risk of long-term complications and to achieve optimal glycemic control. drugs for diabetes: since hyperthyroidism can result in insulin

resistance, it may be necessary to increase dosages of insulin and sulfonylurea medications.

5- Thyroid replacement therapy with levothyroxine (synthroid) is used to treat hypothyroidism. thyroid replacement therapy can raise sugar levels, so it is important to monitor your sugar levels closely while taking it.

6- Get iodine and zinc, which help produce hormones, the most important of which is iodine and the body needs 4500 micrograms per day of iodine. also, patients with hypothyroidism need 33 milligrams of zinc per day and zinc-rich foods such as pumpkin, honey, and watermelon.

7- Get selenium and vitamin b. doctors advise people who suffer from this deficiency to get 544 micrograms per day by eating a lot of eggs, lentils, and chocolate, and get enough vitamin b.

8- Routine examination of thyroid gland hormones.

9- The patient should follow a healthy diet to maintain the body's general health.

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العلاقة بين جنس المصابين بخلل في هرمون الغدة الدرقية ومعدل التحليل التراكمي لمرضي السكري

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الملخص

تفرز الغدة الدرقية هرمونات الثيروكسين، التي تشارك في التحكم في التمثيل الغذائي والنمو والتطور. كما تؤثر على القلب والعضلات والجهاز الهضمي. يمكن أن تنتج العديد من المشاكل الصحية عن خلل الغدة الدرقية، بما في ذلك مرض السكري والخرف والسمنة. تم الحصول على بيانات 83 مريضًا مصابًا بالسكري من مركز الغدد الصماء والسكري زليتن (2023). وأظهرت النتيجة أن نسبة التحليل التراكمي والجنس بينت علاقة بمعدل(0.021)، ونسبة التحليل التراكمي وهرمون الغدة الدرقية(0.515) (TSH) ، أي لا توجد علاقة في هذه الدراسة، ونسبة التحليل التراكمي والعمر كانت (0.439)، أي لا توجد علاقة في المجتمع الذي تم اختياره ، وخلصت الدراسة إلى أن الفحص المنتظم لخلل الغدة الدرقية مهم بشكل خاص لمرضى السكري من النوع الأول، الذين هم أكثر عرضة لخلل الغدة الدرقية.

الكلمات المفتاحية: السكري، الغدد الصماء، التحليل التراكمي ، التمثيل الغذائي، الغدة الدرقية.