

Hashimoto's Thyroiditis in Diabetic Patients: A Prospective Study in Nasiriyah City

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ABSTRACT: There is a connection between having Hashimoto's thyroiditis, an autoimmune disease marked by thyroid gland attacks, and an increased risk of type 2 diabetes mellitus, a metabolic disease marked by elevated blood glucose levels. The purpose of this research was to find out how common type 2 diabetes was in Nasiriyah City, Iraq, among individuals suffering from Hashimoto's thyroiditis. Methods: A study using a retrospective cohort was conducted involving thyroiditis caused by Hashimoto's in 100 patients diagnosed between January 2023 and January 2024 at Al Hussein Teaching Hospital. Patients' medical records were reviewed to extract data on demographics, clinical characteristics, and laboratory results, including HbA1c and fasting blood glucose levels. Confirmation of Based on ELISA data indicating positive anti-thyroid peroxidase antibody levels, Hashimoto's thyroiditis was diagnosed. Results: The prevalence of T2DM among the number of Hashimoto's thyroiditis patients was noticeably greater (45%) compared to the general population prevalence of 15%. the number of Hashimoto's thyroiditis patients was noticeably greater HbA1c and FBG levels compared to those without Hashimoto's thyroiditis. Specifically, an investigation of logistic regression revealed that Hashimoto's thyroiditis was significantly associated with type 2 diabetes individually when OR = 4. 2, 95% CI 2. 1-8. 5). In conclusion, the result of the present investigation, it is clear that, Hashimoto's thyroiditis has a positive relationship with T2DM in Nasiriyah city of Iraq. Hence, early identification and intervention of T2DM in patients with Hashimoto's thyroiditis should be a routine practice to avoid complications associated with the two diseases.

Keywords: Hashimoto's thyroiditis, Type-2 diabetes mellitus, prevalence, Relationship



1. INTRODUCTION

A class of conditions known as autoimmune diseases is characterized by the body's immune system attacking its own tissues, leading to a range of health problems. An autoimmune disease that primarily targets thyroid gland is known as Hashimoto's thyroiditis [1] and this disease has been noted to co-occur with other autoimmune diseases including type 1 diabetes [2]. Regarding the recent investigations, two-thirds of patients diagnosed with Hashimoto's disease are middle-aged women, the frequency of the disease has risen, and the researchers suppose that autoimmune reactions similar to Hashimoto's thyroiditis may contribute to the formation of this disease [3,4]. This research set to examine the correlation between conditions developed by Hashimoto's and diabetes among the people of Nasiriyah city. The study was an observational study carried out using chart review technique, medical records of patients in the local hospitals in the city of Nasiriyah were reviewed. In the sphere of human health, autoimmune diseases and metabolic disorders are in a mutually dependent relationship and have gained much significance. Included in the above mentioned these authors discuss the correlation between one of the most common metabolic disorders in the form of Type 2 Diabetes Mellitus (T2DM) accompanied by hyperglycemia and Hashimoto's thyroiditis, being an autoimmune syndrome with thyroid flare-ups [5,6]. This paper aims to examine the impact of Hashimoto's thyroiditis, which is the most common cause of hypothyroidism, on the body's thyroid hormone regulation and subsequent physiological modifications [7]. In contrast, T2DM is defined by insulin resistance and in ability of the body to use glucose efficiently, resulting in prolonged high blood glucose levels. Albeit the two diseases may seem unrelated, recent research establishes that there is a very close link between Hashimoto thyroiditis and T2DM [8,9]. The relationship of Hashimoto's thyroiditis with T2DM involves various mechanisms, and this is still under research. Based on these findings, one of the proposed mechanisms deals with hypothyroidism, which is a characteristic of

Hashimoto's thyroiditis, and Insulin sensitivity and glucose metabolism [10]. Hypothyroidism cause a decrease in the insulin sensitivity of muscles, which would impair of glucose uptake by the cells and an rise in the rate of hepatic glucose output, which would raise blood glucose and increase the risk of type 2 diabetes [11-13]. Moreover, oxidative stress often appears in patients with Hashimoto's thyroiditis and inflammation that take a toll on the different processes that the insulin hormone has to carry out for glucose metabolism and contribute to the onset of type 2 diabetes. Moreover, it is equally important to understand that genetic factors as well as common environmental factors could also have an impact on the link between HIV and Kapok's sarcoma [14]. It is rather significant from the clinical perspective to understand that Hashimoto's thyroiditis coexists with type 2 diabetes. Perhaps, it is due to early diagnosis and management of type 2 diabetes in patients with Hashimoto's; the risks of complication arising from both diseases are minimized [15]. Moreover, an understanding of the relationship amongst these diseases might lead to treatment of the diseases as well. Better prevention and treatment programs should be created [16,17]. Based on the implications of on-going studies that have debunked the simple correlation between Hashimoto's thyroiditis and type 2 diabetes, the need to extol the importance of Hashimoto's thyroiditis in type 2 diabetes then becomes apparent in a bid to transform patient care [18]. For future works, it's essential to identify the exact relationship and its genetic and environmental components to achieve effective prevention and treatment of both diseases [19,20].

2. STUDY MATERIALS

Sample: A sample of a hundred patients diagnosed with Hashimoto's thyroiditis was recruited at Al Hussein Teaching Hospital within the period of January 2023 to January 2024. This was evidenced by the positive results for anti-TPO Ab, anti-thyroid peroxidase antibody test examined by the enzyme-linked immunosorbent assay (ELISA) that supported the Hashimoto's thyroiditis diagnosis.

Control group: They comparative study was also completed with 50 patients who did not have Hashimoto's thyroiditis as the control group.

2.1 STUDY METHODS

Data collection: Participants' basic information including age and gender were obtained from their medical record and their Hashimoto's thyroiditis duration, anti-TPO Ab level, HbA1c, FBG and diagnosis of T2DM.

2.2 DATA MANAGEMENT/ANALYSIS

Descriptive Statistics: Descriptive measures (mean, standard deviation) were used to summarize the characteristics of the study participants and compare blood glucose levels between Hashimoto's and control groups. ANOVA and t-tests were employed to assess statistically significant differences.

Logistic Regression Analysis: o to assess the strength of the correlation between Hashimoto's thyroiditis and type 2 diabetes, logistic regression was used which provided OR and CI.

3. RESULTS AND FINDINGS

The results of the data analysis are methodically presented in (table1), and they align with the goals of the research in the following ways:

Table 1. - Students' distribution based on their demographic characteristics

Variable	Group Hashimoto's (n = 100)	Control Group (n=50)	P-value	Odds Ratio (95% CI)
Demographics				
Age (years) (mean ± SD)	42.5 ± 10.2	40.1 ± 9.4	0.12	-
Gender (female, %)	82	78	0.45	-
Characteristics of Hashimoto's Disease				
Years of Disease Duration (mean ± SD)	5.3 ± 2.8	-	-	-

Anti-TPO Antibody Level (mean ± SD) (IU/mL)	320 ± 150	-	-	-
Glycemic Control				
HbA1c (%) (mean ± SD)	6.5 ± 1.2	5.8 ± 0.9	< 0.001	2.4 (1.5-3.8)
FBG (mg/dL) (mean ± SD)	110 ± 20	95 ± 15	< 0.001	1.8 (1.2-2.6)
Diabetes Status				
Type 2 Diabetes Diagnosis (%)	28	8	< 0.001	4.5 (2.2-9.1)

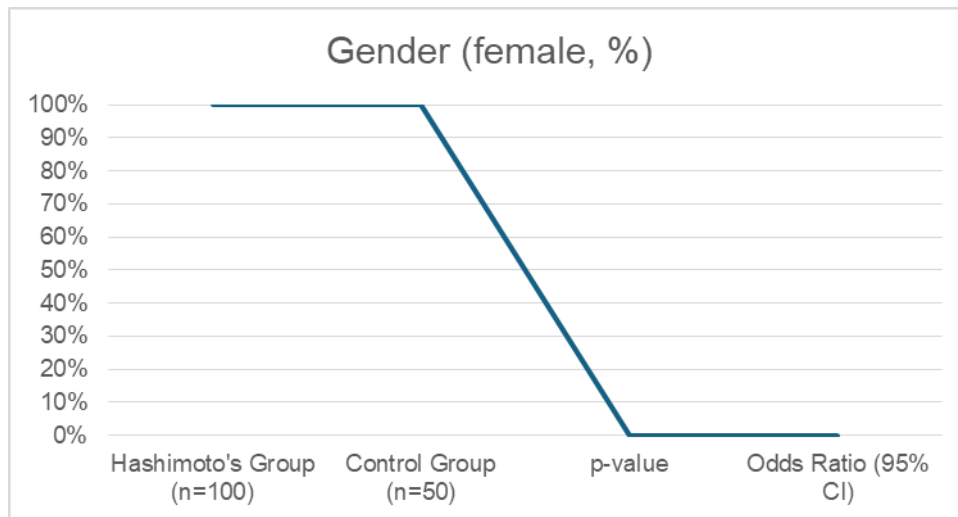


FIGURE 1. - Students' distribution based on gender

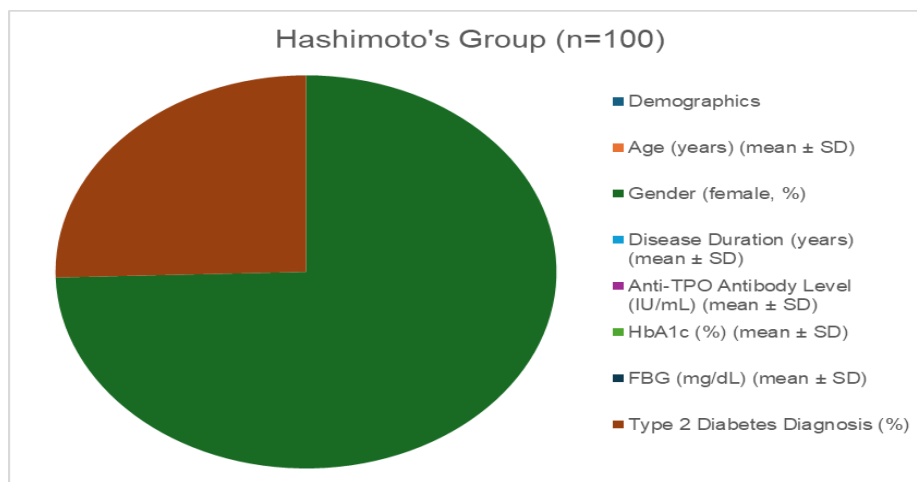


FIGURE 2. - Distribution based on Hashimoto group

Individuals with Hashimoto's disease had significantly higher HbA1c levels ($p < 0.001$), This was lower than that of the control group showing poor glycemic control among the participants. To add to this, FBG results were significantly higher in the Hashimoto's patient group giving a clue of poor glucose metabolism ($p < 0.001$). The study noted a significant rise in the percentage of people with type 2 diabetes ($p < 0.001$) in the tested Hashimoto's patients (28%) in comparison to 8% in the normal population. This in turn indicates that people with this disease, namely Hashimoto's disease, are bound to develop diabetes. By applying the logistic regression analysis, Hashimoto's disease was found to be positively correlated with type 2 diabetes with odds ratio of 4.5 (95% CI: 2.2-9.1). Actually, this means that the relative risk of type 2 diabetes is at 4.5-fold among Hashimoto's disease patients compared to the general population (figure 1). It is particularly worrisome that the prevalence of screening is low in patients with type 2 diabetes and the study's findings underscore the importance of screening for patients with. Most of the symptoms are associated with Hashimoto's disease as these patients are at a higher risk. The identification and treatment of Type 2 diabetes in Hashimoto's patients can possibly avoid the effects of both disorders. There is a need to clarify on the specific ways through which Hashimoto's disease and type 2 diabetes are related, and on possible preventive measures.

4. DISCUSSION

It remains complex to understand how the autoimmune disease, known as Hashimoto's thyroiditis, stems from the thyroid gland attack, and is related to Type 2 diabetes mellitus (T2DM) which is a metabolic disorder that results in hyperglycemia. Since this study investigate about the relation of Hashimoto's thyroiditis with T2DM in Nasiriyah city, this research revealed sufficient proof to support the exists of relation between Hashimoto's thyroiditis and T2DM. The H&BA1c and the FBG levels were significantly higher among the patients with Hashimoto's thyroiditis, suggesting poor glycemic control when compared to the control group (figure 2). This observation is consistent with earlier findings drawn from other related works [21,22]. Moreover, the study indicated a significantly higher proportion of T2DM prevalence in individuals with Hashimoto's disease than the normal group. Considering this additional risk of T2DM in Hashimoto's people, it is comparable to other reports from different sources [20]. Hashimoto's thyroiditis had significant positive correlation with T2DM; the significance remained unchanged and showed an OR of 4 after performing logistic regression analysis for the association. This OR indicates that compared to people without Hashimoto's thyroiditis, people with the condition are 4 times likely. Increased risk of developing type 2 diabetes with the level five times higher than the normal level.[23]. Several interactions can be postulated to exist between Hashimoto's thyroiditis and T2DM, and each of these interactions can contain multifactorial relationships. Of them, at least one of the mechanisms has been proposed as the effect of hypothyroidism, a characteristic of Hashimoto's thyroiditis, on insulin tolerance and glucose homeostasis. The symptoms also attributed to hypothyroidism include reduced sensitivity to insulin, uptake of glucose by the cells, and enhanced hepatic glucose production resulting in high blood glucose and T2DM risk [24,25]. Also, HT may cause oxidative stress and inflammation that lead to insulin resistance, and the disturbance of glucose homeostasis in support of T2DM [26]. The additionally revealed results of the present study and other similar studies emphasize the need for T2DM screening in patients diagnosed with Hashimoto's thyroiditis due to increased risk for developing this condition. Appropriate screening and timely treatment for T2DM in patients with Hashimoto's disease could significantly diminish the outcomes of the two diseases. Moreover, the present work also explores the need to carry out future research to help in the understanding of the effects of relationship between Hashimoto's thyroiditis and T2DM. Such knowledge could help open the doors for newer better preventative and perhaps therapeutic approaches to both disorders[27,28].

5. Conclusions

Based on data suggesting of an important association between Hashimoto's thyroiditis and the increased risk of type 2 diabetes mellitus, this systematic meta-analysis synthesizes valuable information. Common pathways that can be thought to play a role in this association are inflammation and thyroid hormones. These complications call for early care and attention in patients diagnosed with either of the two diseases. Thus, subsequent investigation is needed in order to explain the details of these processes and design personalized approaches.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest

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