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ORIGINAL A R T I C L E

The Effect of Age, Gender According to Types and Duration of Diabetes among Patients in Al-Nasiriyah City

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Abstract

Background A cross-sectional study including patients visiting the Diabetes and Endocrinology Center in the city of Nasiriyah. The ages of patients range from 12 to 75 years. The study was conducted between February 12, 2023 and March 27, 2023. The study used 100 patients with chronic diabetes as samples. The patients were divided into two groups: the first group included 50 patients with known diabetes, and the second group included 50 people without diabetes as a control group. They were reviewed at the Diabetes and Endocrinology Center in Nasiriyah.
Purpose of the study was determine the relationship between the constructed model and self-administered blasting method were used to generate data. Closely relevant socio-demographic questions (age, gender, occupation, family history, body mass index, marital status and residence) were still included in the questionnaire . The study also included comparing the levels of the glycated hemoglobin A1c marker and the fasting plasma glucose level in relation to gender, age and duration in different forms of diabetes.
Conclusion Problems can arise from this metabolic disease, including oral cavity problems. Patients' quality of life may be affected by oral problems, which are a major side effect of diabetes.

Keywords: Diabetes; FPG; HBA1C; BMI; Duration.

1 Introduction

The clinical condition known as diabetes mellitus (DM) is characterized by hyperglycemia, which can be caused by absolute or relative insulin deficiency [1]. Diabetes mellitus (DM) is a common chronic disease that causes high blood sugar [2]. Over the past few decades, research has focused on alternative diagnostic techniques that use distinct additional body fluids in place of blood. Type 1 diabetes and type 2 diabetes are the two main types of the disease. In type 1 diabetes, an autoimmune disease that affects only one organ and causes insulin deficiency, lymphocytes and other immune cells target and destroy beta cells in the pancreas [2,3]. Susceptibility to type 1 diabetes is also influenced by environmental factors [3]. Gestational diabetes, which is any degree of glucose intolerance that begins or is first discovered during pregnancy; Type II, where a defect in beta cells [4] or a decrease in tissue sensitivity to insulin is required for the disease to develop; Some types of diabetes are caused by other causes [2]. There is contradictory evidence in the literature regarding the qualitative and quantitative characteristics of saliva in individuals with diabetes.

1.1 The relationship between body weight/fat and diabetes

In clinical practice, obesity is usually determined by calculating the body mass index (BMI), which is calculated as the product of height in meters squared (kg/m2) and body weight in kilograms. Obesity is traditionally defined as an excess of body fat that poses a health risk (5). BMI has been a common clinical measure to quickly and easily classify patients into risk groups and track changes in adiposity over time in both the individual and the population [5]. Type 2 diabetes has a high prevalence in many countries, which may be explained by the long-standing association between obesity and the disease [5]. Patients with diabetes often have a worse prognosis for infections and, compared with the general population, have higher rates of morbidity and mortality due to sepsis [6, 7].

Obesity has been shown to affect lung function in several mechanical and inflammatory ways [8], increasing the likelihood that an obese person will develop respiratory symptoms and eventually develop respiratory failure [6]. With a dysfunctional adaptive immune system, obesity and diabetes also impair the body's ability to manage and eliminate infections [6]. Diabetes and obesity remain two of the most common non-communicable health problems in the world. Over the past 40 years, there has been a marked increase in the prevalence of obesity, which is defined as an increase in body fat that results in a higher body mass index [9]. According to current guidelines, obesity is defined as a BMI of 30 kg/m2 or more, and more than half a billion people globally were classified as obese in 2016 [9]. The development of type 2 diabetes, a chronic metabolic condition characterized by hyperglycemia due to insulin resistance and/or insufficient insulin secretion in the pancreas, is closely associated with weight gain, body fat distribution, and body mass index [9, 10].

Excess body fat is the definition of obesity. The body mass index (BMI), derived from height and weight measurements, is used to classify people as overweight and obese. Obesity is defined as a body mass index of 30 kg/m2 or higher. According to three public health journals, obesity increases risk factors for heart disease, high blood pressure, and type 2 diabetes (T2DM) [11]. Elevated levels of insulin, glucose, and fatty acids are the appropriate physiological response for people with innate muscle insulin resistance. This is to ensure that the heart and skeletal muscles have enough energy substrate available to support normal activity of the heart and muscles. Therefore, people with type 2 diabetes have a genetic predisposition to muscle insulin resistance, which increases the risk of being overweight or obese [11, 12].

1.2 HbAlc with diabetes

The accepted standard measure for evaluating blood sugar management in individuals with diabetes is glycated hemoglobin A1c, or HbA1c [13]. It is generally recognized that people with type 1 diabetes (T1D) or type 2 diabetes (T2D) who have adequate glucose control, as evidenced by lower glycated hemoglobin A1c (HbA1c), will have better outcomes [13]. HbA1c must be monitored continuously in order to manage diabetes effectively. An HbA1c test is often recommended to diagnose prediabetes and prediabetes and predict future health problems [14]. The American Diabetes Association (ADA) defines a normal level as an HbA1c measurement of less than 5.7%. An HbA1c test result in the range of 5.7%-6.4% is considered prediabetes. When the HbA1c level is ≥6.5%, diabetes is diagnosed [14].

The most effective measure for long-term diabetes management is glycosylated hemoglobin (HbA1c), a standardized measurement that displays the average blood glucose over the previous two to three months [15].

2 Materials and Methods

The total samples consisted of 100 patients divided into two groups: the first group consisted of 50 patients with known diabetes and the second group consisted of 50 non-diabetic subjects as a control group, aged between (12-75) years, who were carefully informed about the aim of the investigation and were free to Accept or reject the investigation; They were all selected from among the people who visited the Diabetes and Endocrinology Center in Nasiriyah. All individuals had BMI levels ranging from 14 kg/m2 to 38 kg/m2.

3 Statistical Analysis

Study variables were statistically analyzed using mean, standard deviation, and Student's t test at a significance level of P ≥0.001.

4 Results and Discussion

4.1 Demographic characteristics of patients with diabetes and healthy subjects

The current study included 50 diabetic patients and 50 healthy controls Threads. The Population characteristics of the patients and the control group are shown in Table 1 and Figures 1 and 2.

The mean age of the patients was 46.14±19.43 and the mean age of the control subjects was 40.26±17.35. The differences between patients and control participants were not statistically significant. aged on average (P = 0.114). The frequency distribution of patients and control groups divided by age groups is also presented in Table 1. Again, there was no significant difference between the age distribution of recurrence in patients and control subjects (P = 0.093).

The patient group included 16 (32.0%) males and 34 (68.0%) females, while the control group included 22 (44.0%) males and 28 (56.0%) females. There was no significant difference in the frequency distribution of patients and control subjects. By gender (p = 0.216) This result is consistent with the results of Kazemian P et al. (2019), who found no significant improvement in prognosis or goal attainment over the study period when compared by age and sex [16].

The mean BMI of patients was 29.0±6.57 and the mean BMI of control subjects was 23.60±3.89 years and the BMI of patients and control subjects differed significantly (P = 0.001). Both diabetes and obesity are becoming more common around the world. Moreover, previous studies have shown that BMI is the main risk factor for type 2 diabetes [17, 18]. The present finding, that there is no significant difference in the distribution of individuals in both groups by age and gender, is a prerequisite to avoid age- and gender-related bias in this case study.

Table 1: Demographic characteristics of diabetic patients and healthy people.

Characteristic	Patients n = 50	Healthy control n = 50	P
Age (years)			
Mean ±SD	46.14 ± 19.43	40.26 ± 17.35	0.114
Range	8 – 75	16 – 77	† NS
<30, n (%)	14 (28.0%)	19 (38.0%)	
30-39, n (%)	1 (2.0%)	6 (12.0%)	0.093
40-49, n (%)	6 (12.0%)	6 (12.0%)	¥ NS
≥ 50, n (%)	29 (58.0%)	19 (38.0%)	
Gender			
Male, n (%)	16 (32.0 %)	22 (44.0 %)	0.216
Female, n (%)	34 (68.0%)	28 (56.0%)	¥ NS
Body mass index (BMI)			
Mean ±SD	29.0± 6.57	23.60 ± 3.89	0.001
Range	14.0 – 44.0	16.0 – 33.0	† S

N: Number of cases; SD: standard deviation; †: independent samples test; ¥: Chi-square test; NS: not significant at $P > 0.05$; HS: highly significant at $P \geq 0.001$

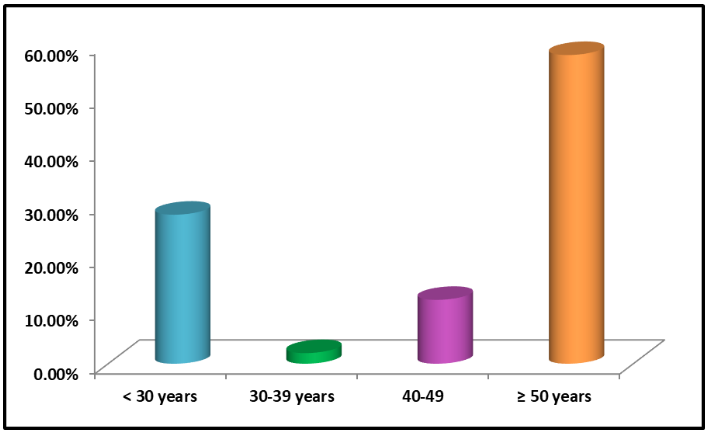

Figure 1: Distribution of patients according to age groups.

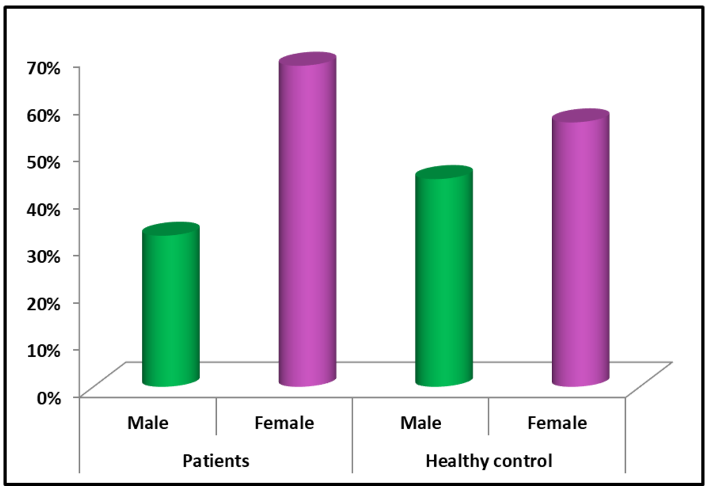

Figure 2: Distribution of patients and control subject according to gender.

4.2 Distribution of patients according to types and duration of diabetes

Table 2 shows the frequency distribution of patients according to the type and duration of diabetes. Patients with type 2 diabetes were more common than those with type 1 diabetes, with a frequency distribution of 37 (74.0%) versus 13 (26.0%), respectively, a significant difference, ($p = 0.001$). The frequency distribution of patients by disease duration was as follows: 16 (32.0%) patients <5 years, 19 (38.0%) patients 5-10 years, 13 (26.0%) patients 11-19 years and only 2 (4.0%) over more than 20 years, and the difference was significant (p=0.004), Table 2.

4.3 Frequency distribution of levels of FPG and HBA1C markers by sex

A comparison was made between the levels of FPG and HBA1C markers by gender, and the results are shown in Table 3. The mean FPG levels were 224.17 ± 83.08 and 238.73 ± 88.52, in male and female sexes, respectively; Mean levels were higher in the female groups compared to the male groups, however, $P = 0.583$ indicates that the difference was not statistically significant. For both sexes, the mean HBA1C values were 8.86 ± 2.11 and 10.09 ± 2.1, respectively; Although there was a difference in mean levels between the male and female groups, it was not statistically significant ($P = 0.062$). When HbA1c readings were compared by gender, women's levels were significantly greater than men's levels. Some other studies have shown results similar to these][19, 20].

Table 2: Distribution of patients according to types and duration of diabetes.

Characteristic	Patients n = 50	P
Types of diabetes		
Type I, n (%)	13 (26.0%)	0.001
Type II, n (%)	37 (74.0%)	¥ S
Duration of disease		
$\geq$ 5 year, n (%)	16 (32.0 %)	
5-10 years, n (%)	19 (38.0 %)	0.004
11-19 years, n (%)	13 (26.0 %)	¥ S
>20 years, n (%)	2 (4.0 %)	

n: number of cases; ¥: Chi-square test; S: significant at P $\leq$ 0.05

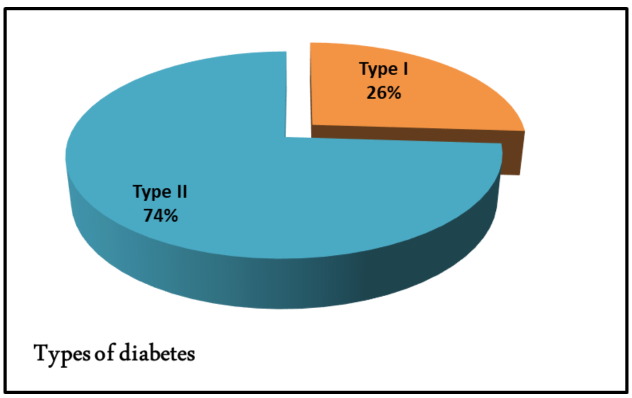

Figure 3: Distribution of patients according to Types of diabetes.

4.4 Frequency distribution of levels of FPG and HBA1C markers by sex

A comparison was made between the levels of FPG and HBA1C markers by gender, and the results are shown in Table 3. The mean FPG levels were 224.17 $\pm$ 83.08 and 238.73 $\pm$ 88.52, in male and female sexes, respectively; Mean levels were higher in the female groups compared to the male groups, however, P = 0.583 indicates that the difference was not statistically significant. For both sexes, the mean HBA1C values were 8.86 $\pm$ 2.11 and 10.09 $\pm$ 2.1, respectively; Although there was a difference in mean levels between the male and female groups, it was not statistically significant (P = 0.062). When HbA1c readings were compared by gender, women's levels were significantly greater than men's levels. Some other studies have shown results similar to these [19, 20].

Table 3: Frequency distribution of FPG and HBA1C levels according to gender.

	Male/Female comparison		
	Male n = 16	Female n = 34	P
Fasting plasma glucose (FPG)			
Mean$\pm$ SD	224.17 $\pm$ 83.08	238.73 $\pm$ 88.52	0.583
Range	102.0 – 360.0	95.0- 399.0	† NS
HBA1C			
Mean$\pm$ SD	8.86 $\pm$ 2.11	10.09 $\pm$ 2.10	0.061
Range	4.30 -11.30	6.50-15.0	† NS

n: number of cases; SD: standard deviation; †: independent samples t-test; NS: not significant at P > 0.05

4.5 Frequency distribution of levels of FPG and HBA1C markers by type of diabetes

The levels of FPG and HBA1C markers were compared according to types of diabetes, and the results are shown in Table 4. For patients with type 1 diabetes and type 2 diabetes, the mean FPG values were 217.53$\pm$97.85 and 239.89$\pm$82.40, respectively. Patients with type 2 diabetes had higher mean levels than patients with type 1 diabetes, but the difference was not statistically significant (P = 0.427). In patients with type 1 diabetes and type 2 diabetes, the mean HBA1C values were 9.35 $\pm$ 2.18 and 10.67 $\pm$ 1.83, respectively. Patients with type 2 diabetes had higher mean levels than patients with type 1 diabetes, but the difference was not statistically significant (P = 0.057). evans m. et al., 2020 results These results are similar. Between T1D and T2D, no significant changes were found. However, the majority of participants in the trials included in this meta-analysis were adults with T1D, making the distinction between T1D and T2D more difficult [13].

Table 4: Frequency distribution of FPG and HBA1C levels according to Types of diabetes.

	Types of diabetes		
	Type I n = 13	Type II n = 37	P
Fasting plasma glucose (FPG)			
Mean± SD	217.53 ± 97.85	239.89 ± 82.40	0.427
Range	103.0 – 399.0	95.0- 399.0	† NS
HBA1C			
Mean± SD	9.35 ± 2.18	10.67 ± 1.83	0.057
Range	7.0 – 14.0	4.30- 15.0	† NS

n: number of cases; SD: standard deviation; †: independent samples t-test; NS: not significant at P > 0.05

5 Conclusion

In the modern world, diabetes has spread like wildfire. Problems can arise from this metabolic disease, including oral cavity problems. Patients' quality of life may be affected by oral problems, which are a major side effect of diabetes. Research suggests that persistent and chronic dental problems in these people have a detrimental effect on blood glucose regulation. Therefore, oral problems associated with diabetes must be prevented and managed.

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Ethical consideration: The ethical committee approved the study at University of Thi-Qar, Thi Qar, Iraq.

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