

Nutritional Status of Pediatric Patients with Type 1 Diabetes Mellitus in DhiQar government

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Abstract

Diabetes mellitus (DM): It is one of the chronic metabolic disorders that affect the body and cause a large number of problems and complications, especially in the case of neglecting treatment and not adhering to it. It is a disease of high blood glucose level due to the body's lack of production of the hormone insulin or the lack of response of the body's cells to insulin or both. The aim of the study is to know the characteristics of children with type 1 diabetes in DhiQar Governorate and to know the health status of children by knowing the body mass index of each sick child. This study was carried out from the October 2020 until the end of March 2021. And were taken 528 patients from the DhiQar Specialized Center for Endocrinology and Diabetes, and the data collected were presented through appropriate tables and figures for research and appropriately statistically analyzed. A statistical significant association ($p < 0.05$) with regard to the basic characteristics the study found. The incidence of diabetes in males is higher than in females, but with a small significant difference 53.6% for males and 46.4% for female, as well as the incidence of diabetes in the sub-districts are higher than the city center. The study also found that most of the children suffer from weight loss, and their number is 346, and the largest group is from school age, where their number is 222. The study also found that the majority of children with type 1 diabetes had no family history of diabetes.

Key words: Diabetes mellitus, Insulin, adolescent

Introduction:

The World Health Organization (WHO) define the diabetes mellitus as "a metabolic disorder of multiple etiology characterized by chronic hyperglycemia with disturbances in carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action or both". So uncontrolled blood levels of insulin commonly leads to high blood sugar levels which may cause intensive damage to human body if it continues for a long period of time [6].

Diabetes mellitus (DM) represents one of the most common metabolic disease in the world, with

rising prevalence in recent decades [1,2]. Most cases are generally classified into two major pathophysiological categories: type 1 diabetes mellitus (DM1), which progresses with absolute insulin deficiency and can be identified by genetic and pancreatic islet autoimmunity markers, and type 2 diabetes mellitus (DM2), which is the most prevalent form and involves a combination of resistance to the action of insulin with an insufficient compensatory response of insulin secretion. The natural history of diabetes involves increased risk for acute and severe complications such as diabetic ketoacidosis and hyperosmolar hyperglycemic state, and also chronic micro vascular (retinopathy, nephropathy, peripheral and autonomic neuropathy) and macro vascular (coronary atherosclerotic vascular, cerebral and peripheral vascular disease) complications that negatively affect the quality of life and survival of these patients [3]. Approximately 1 million people die every year as a result of diabetes, two-thirds of which in developing countries [4]. WHO projects that diabetes will be the 7th leading cause of death in 2030 , healthy diet, regular physical activity& maintaining a normal body weight can prevent or delay the onset of diabetes [5]..

Pathophysiology of Type 1 Diabetes Mellitus:

Pathophysiology of type 1 diabetes (IDDM) The autoimmune destruction of pancreatic β -cells, leads to a deficiency of insulin secretion which results in the metabolic derangements associated with IDDM. In addition to the loss of insulin secretion, the function of pancreatic α -cells is also abnormal and there is excessive secretion of glucagons in IDDM patients. Normally, hyperglycemia leads to reduced glucagons secretion, however, in patients with IDDM, glucagons secretion is not suppressed by hyperglycemia [39] .The resultant inappropriately elevated glucagons levels exacerbate the metabolic defects due to insulin deficiency

Methodology:

This cross-sectional study was carried out on Dhi-Qar Specialized Center for Diabetics and Endocrinology/ Iraq. Dhi-Qar governorate is located in the south of Iraq it has only one center for DM patients. This center is provided care to diabetes patients from all age groups living in the governorate since it has been establishing in 2007. Records of all the Children (below 16 years old) diagnosed with Type 1 DM from October 2020 until the end of March 2021 were studied. The records were (Gender, Age, Living place, Weight, and Height /length). The BMI was calculated from the weight and height/length and the patient categorized into 4 groups according to the BMI-for-Age percentile chart as following: Underweight (less than 5th percentile); Normal weight (5th to less than 85th percentile); overweight (85th to less than 95th percentile); and obese (95th percentile or greater).

The patients also categorized according to their living place into two groups: urban and rural and according to their age groups into three groups : preschool (below 6 years old) ; school age (6 to 13 years old) and Adolescent (13 to 18 years old).Statistical analysis were done using SPSS V.25 program. A formal approval was obtained from the Dhi-Qar Health Directorate and from Southern Technical University to conduct the study.

Result and Discussion:

Table1: BMI distribution according to Sex for children diagnosed with type 1 DM in Dhi-Qar Governorate/Iraq (N=528)

BMI Groups	Male		Female		Total	
	No.	%	No.	%	No.	%
Underweight	163	30.9	183	34.7	346	65.6
Normal Weight	54	10.2	61	11.6	115	21.8
Over Weight	16	3	19	3.6	35	6.6
Obesity	12	2.3	20	3.8	32	6
Total	245	46.4	283	53.6	528	100
P Value = 0.93						

The current study showed that the number of diabetic females who suffer from underweight reached 183 and percentage 34.7% , while the number of males was 163 and their percentage 30.9% . The number of females of normal weight reached 61 and their percentage 11.6%, and the number of males reached 54 and their percentage 10.2%.The number of females who suffer from overweight 19 and percentage 3.6% , while males , reached their number 16 and percentage 3.0%. The number of obese children 12 , and their percentage 2.3% of males. and While the number of females suffering from obesity 20 and percentage 3.8% .

Through this study, it was found that the number of females who have a defect in their weight is greater than the number of males .this study agree with In a study conducted by (Sahra et al ;2012).

Tabel 2: BMI distribution according to age for children diagnosed with type 1 DM in Dhi-Qar Governorate/Iraq (N=528)

BMI groups	Age Group							
	Preschool		School Age		Adolescent		Total	
	No.	%	No.	%	No.	%	No.	%
Under Weight	58	11	222	42.1	66	12.5	346	65.6
Normal Weight	2	0.4	60	11.4	53	10	115	21.8
Over Weight	0	0	14	2.7	21	4	35	6.6
Obesity	0	0	12	2.3	20	3.8	32	6
Total	60	11.4	308	58.3	160	30.3	528	100

P value < 0.01

The current results showed that the most diabetic patients were have underweight BMI and in third age (School Age group) their number 222 and percentage 42.1%, They are followed by children from the fourth category (Adolescent) as their number 66 and percentage 12.5%, Then the children of the second category) Preschool) their number 48 and percentage 9.1%, and the lowest age group in the same BMI was first age group (Toddler) their number 10 and percentage 1.9%.

Thus, the total number of children with diabetes who suffer from underweight has reached 346 , and their percentage 65.6% is high, according to the number of children taken for the study, which is 528. The largest number of children with normal weight was in the third age group as well, where their number 60 and percentage were 11.4% . followed by children from the fourth category where their number 53 and percentage 10.0%. Then the children of the second category where their number 2 and percentage 0.4% . Thus, the total number of children with diabetes and have a normal weight 115 and percentage has reached 21.8% . While the largest number of overweight children were in the fourth category where their number 21 and percentage 4.0% , followed by the third category where their number 14 and percentage 2.7% .

Thus, the total number of children with diabetes who suffer from overweight has reached 35 and their percentage 6.6% . While the number of children suffering from obesity 20 and percentage 3.8% for Adolescent .and 12 and percentage 2.3% for School Age .

Table3: BMI distribution according to Living area for children diagnosed with type 1 DM in Dhi-Qar Governorate/Iraq (N=528)

	Living place				Total	
	Rural		Urban			
BMI	No.	%	No.	%	No.	%
Under W	171	32.4	175	33.2	346	65.6
Normal W	57	10.8	58	11	115	21.8
Over W	18	3.4	17	3.2	35	6.6
Obesity	19	3.6	13	2.5	32	6
Total	265	50.2	263	49.8	528	100
P. value = 0.808						

The study recorded that the most diabetic patients were rural habitation and there number 265 and percentage 50.2%, and lowest in urban habitation there number 263 and percentage 49.8% According to BMI . the most urban patients located in underweight BMI there number 175 and percentage 33.2% While the number 171 and percentage 32.2% of children in urban areas . The number of children of normal weight in urban areas reached 58 and percentage 11.0% , in contrast reached the number of children in rural areas 57 and there percentage 10.8% . The number of children who suffer from overweight in urban areas17 and their percentage 3.2% , as for the number in rural areas 18 and there percentage 3.4%. While the number of children suffering from obesity 19 and percentage 3.6% in rural areas . the number 13 and percentage 2.5% in urban areas .

Conclusion and Recommendation

The current study found that the incidence of type 1 diabetes in males is higher than females, but with a small significant difference. There was a high prevalent for patient with suffer from under Wight from children with type one diabetes mellitus and their percentage 65.2%. The current study showed that the largest number of patients are from the districts and sub-districts, compared to the number of patients who live in the governorate center, but with a small significant difference.

Ethical Clearance and financial support

Lastly the ethical approval for this study was issued by the ethical committee of college of health and medical technology/ southern technical university . Moreover there was a financial support

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