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Research Article

**STUDY TO KNOW THE ASSOCIATION OF IMPAIRED
GLUCOSE TOLERANCE TEST WITH FIRST DEGREE
RELATIVES OF DIABETICS**¹Dr. Sania Khan, ²Dr. Ayesha Huma, ³Dr. Syeda Saba Sohail¹Azad Jammu Kashmir Medical College, Muzaffarabad²WMO at DHQ Hospital, Chakwal³Shaheed Zulfiqar Ali Bhutto Medical University, Islamabad**Abstract:**

Diabetes is linked with advanced age, obesity, diabetes family history, physical inactivity and so on. It is the most frequently associated disease. Genetic factors interact with environmental factors and are complex. Impaired glucose tolerance is also proved as a risk factor.

Objective: The purpose of this analysis was to determine the association of impaired glucose tolerance with diabetes in first degree relatives.

Study Design: An experimental observational Study.

Place and Duration: In the Medicine Unit II of Holy Family Hospital Rawalpindi for six months duration from January 2018 to June 2018.

Methods: Fifty first-degree diabetic patients of both sexes were included in the study as experimental volunteers. The patients were divided into three groups according to their age, ie, ages ranging from 14 to 25 years, with a range of ages ranging from 26 to 35 years and with a group of 26-35 years and from 36 to 50 years.

Results: BMIs of the first-degree relatives of males in the 14-25 age group were increased significantly ($P < 0.01$) contrast to the controls, with ages ranging from 26 to 35 years the first degree relatives BMI did not increase significantly compared to the group of control ($P > 0.06$), and the BMI of the first-degree relatives of the males in the 36-50 age group was higher than the control group showed a very obvious variation ($P < 0.01$).

Conclusion: GTT increased in the age group (14-25) in the first-degree relatives of diabetes in contrast to the control group, but vast difference was observed in fasting and GTT in 1 hour ($P < 0.01$). BMI with ages between 26-35 showed a significant change after $\frac{1}{2}$ h of blood glucose sample. In the 35-50 age groups, there is a significant change in fasting blood sugar in BMI.

Key words: glucose tolerance test, first degree relatives, diabetes, BMI.

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INTRODUCTION:

Diabetes is a metabolic syndrome with hyperglycemia, insulin resistance, obesity, dyslipidemia, hypertension, endothelial dysfunction and atherosclerosis. According to World Health Organization experts, there is globally raised in the adult patient's number with diabetes, from 136 million in 2001 to 400 million in 2012. It is estimated that the highest rise in the diabetes prevalence in China is estimated (69%) and India (60%). The Pakistani lineage examined 1,320 people (26-80 years) and reported 60% of diabetics. Diabetes mellitus type 2 is the result of insulin resistance. In type 2 diabetes about 82 percent of people with are overweight. Genetic factors are interacting with environmental factors and complex in a lesser known manner. Impaired glucose tolerance is also proved as a risk factor.

MATERIALS AND METHODS:

This experimental observational Study was held in the Medicine Unit II Department of Holy Family

Hospital Rawalpindi for six months duration from January 2018 to June 2018. Fifty first-degree diabetic patients of both sexes were included in the study as experimental volunteers. Into 3 groups, the patients were divided according to their age, ie, ages ranging from 14 to 25 years, with 26 to 35 years age range and with a group of 36-50 years. A blood sample was taken in an empty stomach to give a glucose tolerance test and 50-60 g glucose solution was given orally to the patient. Times were recorded and more blood samples were taken at 30, 1 hr, 2hrs and 3hrs intervals. Urine samples (for urine sugar) were also collected with each blood sample. 20 people without diabetes history were accepted as controls.

RESULTS:

Details of the results are given in Tables 1 and 2. The GTT was tabulated in the males of first-degree relatives in the 14-25 age range according to the controls (Table 1).

Table 1: Glucose Tolerance Test in Males of First Degree Relatives Of Diabetics and Controls

	14-25		26-35		36-50	
	Subjects(n=8)	Controls(n=10)	Subjects (n=8)	Controls (n=10)	Subjects (n=9)	Controls (n=10)
Age (yrs)	19.0±2.2	21.4±4.7	30.2±2.8	34.4±7.8	41.8±5.7	34.4±7.8
BMI	30.5±5.3**	23.2±1.3	30.4±5.3	26.1±2.6	34.4±3.6**	26.1±2.6
Fasting (mg/dl)	112.4±18.1**	70.0±10.0	112.2±28.8**	73.2±8.5	123.0±3.3**	73.2±8.5
1/2 hour (mg/dl)	143.8±7.4**	100.0±28.3	144.2±22.7	116.90±16.2	171.0±14.1**	116.9±16.2
1hour (mg/dl)	123.0±15.9	107.0±14.8	139.20±19.3	127.7±14.5	151.8±7.9**	127.7±14.5
1:30min (mg/dl)	109.0±16.7	104.0±29.6	122.8±18.8	116.9±16.2	124.0±8.2	116.9±16.2
2hour (mg/dl)	100.8±14.6	89.0±15.97	108.2±29.1	101.5±8.8	103.4±7.1**	101.5±8.8

**P<0.01; *P<0.05

The first-degree relatives BMI of the males increased remarkably contrast to the controls (P <0.01). Sugar level increased significantly after half an hour (P <0.01). Blood glucose levels on the other side increased after 1, 1: 30min and 2 hours had also in 1st-degree relatives, but there was no remarkable difference. The glucose tolerance of first-degree relatives was tabulated according to controls in the of men aged 26-35 years, (Table 1). The first-degree relatives BMI of the males was not increased significantly compared to the group of control (P> 0.06). Blood sugar fasting level was higher than control and had very high variation (P <0.01). The blood glucose level increased by ½ hour, 1 hour, 1: 30 min, 2 hours in the first hour relatives, but this was not remarkable. GTT in first-degree relatives of men aged 35 to 50 years in the control group (Table 1). It was noted that first-degree relatives BMI of the males was higher than the control and there was a vast difference (P <0.01). The fasting blood glucose level and ½ hour and 1 hour later sugar were higher than control and significantly static difference was noted (P <0.01). Blood glucose level was significantly higher at 1 and 2 hours than the group of control (P <0.02). According to the controls, glucose tolerance was established in the first-degree relatives of women aged 14-25 years (Table 2).

Table 2: Glucose tolerance test in females of first degree relatives of diabetics and controls

Parameters	Age (yrs)					
	14-25		26-35		36-50	
	Subjects (n=8)	Controls (n=10)	Subjects (n=8)	Controls (n=10)	Subjects (n=9)	Controls (n=10)
Age (yrs)	20.25±4.6	22.00±2.1	29.67±3.9	34.40±7.8	45.11±4.2	34.40±7.7
BMI	27.02±4.98	25.0±1.5	25.78±6.1	26.10±2.6	40.11±11.6**	26.10±2.6
Fasting (mg/dL)	90.75±22.1	79.0±15.9	102.0±16.7	73.20±8.5	122.67±31.5**	73.20±8.5
1/2 hour (mg/dL)	117.0±28.3	116.40±23.6	164.33±40.6**	111.20±11.9	173.44±36.5**	111.20±11.9
1hour (mg/dL)	131.75±19.1	114.0±4.9	126.0±25.9	127.70±14.5	173.56±30.5*	127.70±14.5
1:30min (mg/dL)	112.53±23.2	106.0±5.5	116.67±23.1	116.90±16.1	163.67±75.6	116.90±16.1
2hour (mg/dL)	94.25±21.7	88.0±8.4	104.33±22.4	101.50±8.8	151.22±73.9	101.50±8.8

**P<0.01; *P<0.05

The patients BMI was higher than the controls, but this difference was not vast. Blood glucose levels, fast hours after fasting, 1 hour 1:30 minutes and 2 hours, first-degree relatives had increased, but there was no remarkable variation.

DISCUSSION:

Diabetes creates a significant burden worldwide and is expected to increase. Many diabetic patients face significant difficulties in accessing diagnosis and treatment that contribute to high mortality and complication prevalence. First-degree relatives of people with type 2 diabetes have a risk of developing hyperglycemia. They also represent a suitable cohort to examine the exchangeable glucose tolerance test in first-degree relatives of diabetics. BMI and glucose tolerance tests in first-degree men were compared with changes in the diabetic age group between the ages of 14-25. BMI and fasting blood glucose levels of the first-degree relatives of the males were significantly higher than the controls ($P < 0.01$). However, in one study, age and BMI, fasting blood sugar was reported to show no significant difference between first-degree relatives and controls of diabetes (8). In this study, GTT was found to increase first-degree relatives with diabetes mellitus (14-25) compared to controls, but with a significant difference ($P > 0.05$), only fasting and 1: 30 minutes conditions. Our findings are consistent with a study showing that first-degree relatives with type 2 diabetes have an increased risk of diabetes due to increased GTT. This risk increases with age and BMI. A study has also been observed in which BMI has increased significantly and changed GTT has changed in first-degree relatives of diabetic patients. According to the American Diabetes Association, an inadequate glucose tolerance test and a higher BMI may lead to an increased risk of diabetes with first-degree relatives of diabetes. The relationship is considered to be > 200 mg / dL as first-degree relatives with FBS diabetes risk, and after 2 hours, it

is recommended that the plasma glucose is 126 mg / dl. In another study, it has been reported that the increase in BMI may increase blood glucose levels, which may be related to insulin resistance, and this increases the risk of diabetic patients with first-degree relatives. Impaired GTT was more prominent in the 26-35 age group than in 14-25. This showed that the risk of diabetes patients was more frequent with age increase. A number of studies are consistent with our work. These studies have commented that insulin resistance is found in people at high risk of developing diabetes. Their study concluded that the function of beta cells was relatively low in some groups and the risk of developing hyperglycemia was high. Our study was consistent with a study in which impaired GTT testing in first-degree diabetes patients was due to a decrease in the function of beta cells and its effect on insulin reduction.

CONCLUSION:

It was concluded that impaired glucose tolerance test and body mass index may be a measure of early diagnosis of diabetes in both male and female first-degree relatives.

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