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ASSOCIATION BETWEEN INSULIN RESISTANCE AND MEASUREMENT OF PHYSICAL ACTIVITY IN OLDER ADULTS WITHOUT DIABETES MELLITUS

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Abstract:
Introduction: *Diabetes mellitus (DM) has been emerging as a major healthcare problem in Pakistan with 7.0 million people suffering from it and the number of diabetic patients is estimated to rise to a staggering figure of 14.4 million by the year 2040 making Pakistan the 8th highest country in the world in terms of burden of diabetic patients.* ***Aims and Objectives:*** *The basic aim of the study is to find the association between insulin resistance and measurement of physical activity in older adults without diabetes mellitus.* ***Methodology of the study:*** *The study was conducted at Quaid-e-Azam Medical College, Bahawalpur during March 2019 to January 2020. The data was collected from 100 diabetic patients who was suffering from diabetes from last one year. After approval by the hospital ethical review committee, informed written consent was taken from the patients prior to inclusion in the study. Patients from both genders, age range 35 to 65 was selected for this study.* ***Results:*** *The demographic values shows that there is a significant relation between diabetes and hyperlipidemia in a local population of Pakistan. The value of HbA1C is 5.77 ± 0.50 in diabetic patients as compared to normal group.* ***Conclusion:*** *In our study, strong positive correlation was found between serum TC, TG, LDL-C with both BSF and HbA1c, while HDL-C showed weak negative correlation with both BSF and HbA1c. Serum cholesterol, LDL-C and TG levels were significantly elevated and serum HDL-C level was decreased in patients with diabetes.*

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INTRODUCTION:

Diabetes mellitus (DM) has been emerging as a major healthcare problem in Pakistan with 7.0 million people suffering from it and the number of diabetic patients is estimated to rise to a staggering figure of 14.4 million by the year 2040 making Pakistan the 8th highest country in the world in terms of burden of diabetic patients[1].

The aging population is growing worldwide and the proportion of people above 60 years old accounts for 15% of the whole population which is estimated to 7.5 billion. In general, 20% of old people have DM, and a similar proportion have undiagnosed DM. Reported frequencies vary from 18% to 33%. This range may reflect differences in the age, life style, and genetic background of the analyzed populations. On another hand, 30% of old people have impaired glucose regulation which means an increased risk for DM[2]. Actually, DM in elderly includes two groups: "survivors" of young or middle age onset of diabetes, and incident diabetes in older age or type 2 DM. Type 1 DM is exceptional in elderly as auto immune diseases affect young populations. So old people with type 1 DM are practically at the end stage of their disease and are multi complicated. Most people over than 60 years old suffer from type 2 DM due to insulin resistance. However, insulin secretion may be severely reduced at the end stage of type 2 DM[3].

Consequently, complications, and management of DM in elderly vary according to hyperglycemia duration, personal background, and co-morbidities. Some old people do not have any complication and are easy to manage; others are multi complicated and have additional severe diseases difficult to treat even in highly specialized centers[4]. The last group is encountered among survivors of young onset DM. The main troublesome co-morbidities in elderly are heart and kidney insufficiencies leading to limitation in medicine prescription.

Insulin resistance is the major finding in several metabolic disorders, including type 2 diabetes, metabolic syndrome, dyslipidemia, and hypertension. Homeostasis model assessment (HOMA) was proposed as a simple and inexpensive technique to evaluate insulin resistance in vivo. Although the HOMA-IR has been widely used for the study of insulin resistance, the threshold value for insulin resistance has not been conclusive[5]. The morbidity and mortality related to DM is mainly attributed to its microvascular complications including retinopathy, nephropathy and neuropathy.

Aims and Objectives

The basic aim of the study is to find the association between insulin resistance and measurement of physical activity in older adults without diabetes mellitus.

METHODOLOGY OF THE STUDY:

The study was conducted at Quaid-e-azam Medical College, Bahawalpur during March 2019 to January 2020. The data was collected from 100 diabetic patients who was suffering from diabetes from last one year. After approval by the hospital ethical review committee, informed written consent was taken from the patients prior to inclusion in the study. Patients from both genders, age range 35 to 65 was selected for this study. The pre devised proforma was completed by single researcher endorsing subject's demography, and clinical profile. Fasting plasma glucose, serum TC, HDL-C, LDL-C, TG and insulin resistance was measured by using Randox kit.

SPSS 17.0 for windows was used for statistical analysis. Descriptive statistics i.e. mean ± standard deviation for quantitative values (age, duration of DM, BMI, BSF, lipid sub fraction levels and HbA1C) and frequencies along with percentages for qualitative variables (gender, smoking status) were used to describe the data. Independent sample 't' test.

RESULTS:

The demographic values shows that there is a significant relation between diabetes and hyperlipidemia in a local population of Pakistan. The value of HbA1C is 5.77 ± 0.50 in diabetic patients as compared to normal group. (Table 01)

Table 01: Clinical and biochemical profile of study population.

Variable	Diseased group	P value
Age (years)	48.04 ± 4.83	0.018
Male, n (%)	71 (50.71%)	0.285
Smoker, n (%)	32 (22.85%)	< 0.01
Duration (years)	4.60 ± 3.03	0.067
BMI (kg/m^2)	26.31 ± 2.71	0.418
Plasma Glucose (F) mg/dl	117.34 ± 7.93	< 0.01
HbA1C (%)	5.77 ± 0.50	< 0.01

We found strong positive correlation between severity of DR with BSF, HbA1c, serum LDL-C, TC and TG, whereas, age and duration of DM showed moderately positive correlation with severity of diabetes. (Table 2)

Table 02: Lipid sub fraction values among subgroups.

Lipid Profile	Diseased group	P value
Serum Cholesterol (mg/dl)	187.26 ± 17.46	< 0.01
Serum LDL-C (mg/dl)	92.59 ± 11.53	< 0.01
Serum HDL-C (mg/dl)	45.63 ± 4.44	< 0.01
Serum TG (mg/dl)	169.28 ± 9.83	< 0.01

DISCUSSION:

The current study investigates the relationship of diabetes with lipid profile. Diabetes is a common issue now a days so that we investigate its effect and one prospect is lipid profile. Diabetes is a major cause of mortality globally, and it has been estimated that 400 million people worldwide will suffer from it by 2030[7]. Despite the fact that hereditary qualities seem to assume an essential part in the advancement of diabetes, examine recommends that dietary decisions driven by natural and financial components are of critical significance. Amazing eating regimens assume an essential part in diabetes avoidance[8]. Suitable dietary adherence can enhance insulin affectability and glycemic control, and consequently add to way of life change and general personal satisfaction. Nonetheless, past research recommends that dietary adherence is seemingly among the most troublesome foundations of diabetes administration[9]. Higher HEI scores demonstrate nearer adherence to current dietary rules for singular food and supplement gatherings. For the sufficiency segments, for example, vegetables and natural product, a higher score demonstrates higher utilization. Dietary proposals depend on the useful effects of devouring products of the soil and expressly stress their constructive outcomes of decreasing corpulence and certain sorts of growths. The last three segments of the HEI incorporate refined grains, sodium, and discharge (calories from strong fats, liquor, and included sugars) and a higher score demonstrates bring down utilization[10].

CONCLUSION:

In our study, strong positive correlation was found between serum TC, TG, LDL-C with both BSF and HbA1c, while HDL-C showed weak negative correlation with both BSF and HbA1c. Serum cholesterol, LDL-C and TG levels were significantly elevated and serum HDL-C level was decreased in patients with diabetes.

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