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Tendency of Physical Activity in Type 2 Diabetic Patients of Hazara Division

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A B S T R A C T

Background: A chronic disease, type II diabetes that had resistance towards insulin elevated level of glucose. The occurrence of T2DM in Pakistan raised and it is increased by obesity, dietary intake and sedentary lifestyle. Duration of time and the intensity of physical activity have effect on progression of diabetes as low level of physical activity have slight effect on diseases.

Objective: To evaluate the tendency of physical activity in person with type 2 diabetic.

Methodology: It was a cross section comparative study. The duration of study was four months and non-probability convenient sampling technique was used. The sample size was calculated by Raosoft which was 293.the International Physical Activity questionnaire was filled by patients. Metabolic Equivalent Task were find out by using IPAQ. Data was analysed by using IBM SPSS version 22. The statistical significance was setup at confidence interval (CI) of 95% i.e. P value of 0.05. For finding association the chi square were considered. Descriptive statistics were analyzed for demographics. Baseline normality was evaluated by using value Shapiro-Wilk.

Results: A total n=293 participants with mean age of 52.90 ± 9.846. Out of 293 participants 145 (49.5%) were male and 148 (50.5%) were female. The total patients were classified into three group on the basis of their physical activity such as high, moderate and low. Physical activity related to Random Blood Sugar in controlled level of RBS group 18.6% of the patients were high physical active, 40.7% were moderate and 40.7% were low physical active. In Mild RBS group of patients 13.6% were high physical active, 36.4% of the patients were moderate physically active and 50% of the patients were low physical active. In moderate RBS group high MET were 9.2%, 44.6% were moderate and 46.2% were low physical active. With severe RBS high physical active patients were12.3%, moderate were 30.9% and 56.8% were low physical active.

Conclusion: The study showed the physical activity trend is low in insulin resistant diabetes patients. Those individuals with high level of physical activity have good glycemic control. It is concluded from the present study that high physical activity shows significant effect on control of diabetes type 2.

Key Words: Cardiovascular Diseases, DSMQ, Fasting Blood Glucose, IPAQ, MET, Non-Communicable Disease, Type 2 Diabetes Mellitus

Introduction

In diabetes mellitus the increases level of glucose in blood and resistance to insulin[1]. Primarily it is identified as insulin independent diabetes mellitus.[1] In 2013, 382 million population of the world about 8.3% of young people were affected by diabetes mellitus.[2, 3] Diabetes is strongly related to genetics and have six times more chances than normal or non-diabetic family history.[4] Diabetes is more prevalent in urban population of Pakistan with increased body mass index due to unhealthy, junk foods and sedentary behavior.[4] Adequate quantity of exercise or activity with medications and weight loss can

decreases symptoms and complications of diabetes[5], also regulate consumption of glucose and decreases insulin resistance.[6] The possibility of type 2 diabetes decreases by weight reduction and improving activity level.[7] In prediabetic and diabetic individuals about 60% had insufficient level of physical activity.[8] In Pakistan the diabetes type 2 prevalence is 11.77 %.[9] In rural population of Pakistan the prevalence of diabetes is 10.3 % and 14.8% in urban population[9]. As compared to other provinces there is decreased incidence of diabetes in Khyber Pakhtunkhwa.[10]

Vigorous activity of 75 minutes per week with metabolic equivalent of task (MET) of 6.5 and 150 minutes of moderate level of activity in a week with 4.5 MET are suggested for physical active subjects.[11] The prevalence of diabetes decreases to 26% by increasing the MET to 11.25 hours per week that is 150 minutes per week.[11, 12] The main problem related with person with type2 diabetes was nerve dysfunction peripherally which led to feet ulcers and necrosis of feet. The disease and death rate are associated with neuropathy in person with type2 diabetes. The impaired control of glucose, the changes in glucose level is presently known as a main indicator of difficulty of diabetes. A proper regulation of glucose by mean of HbA1c can improve the condition of nerve damage.[13] The quality of life enhanced by physical activity in diabetic with peripheral nerve disorder. The encouraged individuals had good attitude to perform activity that they perceive good mental and physical. The strengthen public relations related with the exercise. To influence and encourage the individual with diabetes documenting the exercise is important to do further activity and assist managing metabolism[14] Pieter de Mol *et al.,* 2014 according to that study a rising variety of topics with hyperglycemia take part in sports at height including snowboarding, hiking, and trekking. Exercise beneath situations of hypobaric hypoxia poses a few specific encounters on person with type2 diabetes, and the existence of diabetes can be disturbing the secure hit involvement in activities at height. height adapt glucose-regulation. bloodless fevers and height can disturb precise glucose reading on device. Elements possibly cause hazardous glycemic control. The aim of this study was to offer a modern impression of the pathological and physical variations at some point of activity at height the capacity of complications related, which include usage of video display units of glucose and pumps of insulin. For recommended realistic suggestions for provisions and transport to height for diabetic participants.[15] The Objective of the present study is to determine the tendency of physical activity in person with diabetes and also find out the association of RBS with MET.

Methodology

It was a cross section comparative study. The duration of study was four months and non-probability convenient sampling technique was used. The ethical approval certificate Ref No.HHIRS/RnD/Eth-Noc/2023 after approval from HHIRS research ethical comitee. The sample size was calculated by raosoft which was 293. the International Physical Activity questionnaire was filled by patients. Metabolic Equivalent Task were find out by using IPAQ.

Data was analysed by using IBM SPSS version 22. The statistical significance was setup at confidence interval (CI) of 95% i.e. *P* value of 0.05. For finding association the chi square were considered. Descriptive statistics were analyzed for demographics. Baseline normality was evaluated by using value Shapiro-Wilk. According to Shapiro-Wilk value was 0.00 which were significant. Frequencies and percentages of different comorbidities were analyzed by descriptive statistics. Pie charts and multiple bar chart were used to indicate percentages and frequencies Association of diabetes with MET. The study was conducted in district Mansehra and Abbottabad of Hazara Division. The inclusion criteria for this study include individuals who have confirmed type II Diabetes, aged between 35 to 70 years, of both genders, with cognitive and communication problems. Additionally, participants with malignant/neoplasm conditions and those unable to read Urdu are also included. These criteria aim to ensure a diverse sample representative of the population being studied while addressing specific health and communication challenges relevant to the research objectives.

Results

Table I presents the demographics of the study participants, including age, gender, marital status, HbA1c levels, MET scores, and calorie intake including the mean age of Age, Hba1AC.

The mean and standard deviation of sum scale 5.920 ± 1.277 and sub scale management of glucose were 8.12 ± 1.88, dietary control was 5.625 ± 1.406, physical activity 2.611 ± 3.841 and health care 5.907 ± 1.647of diabetes self-management questionnaire (Table II)

In controlled RBS high level activity participants were (18.6%), moderate (40.7%) and 40.7% were low physical active. In mild RBS the high physical active were (13.6%), moderate were (36.4%) and (50%) were low physical active.

In moderate RBS group high physical active were (9.2%), moderate (44.6%) and low physical active were (46.2%). In

severe RBS group the high physical active were (12.3%), moderate (30.9%) and low physical active were (56.8%)

Table I: Demographics of age, gender, marital status, HbA1c, MET and calorie.

Variables	Categories	N (%)	Mean ± S. D
Age (years)	35 to 44 years	58 (19.8)	38.90 ± 3.121
	45 to 59 years	143 (48.8)	51.29 ± 4.574
	60 to 70 years	92 (31.4)	64.25 ± 3.609
Gender	Male	145 (49.5)	
	Female	148 (50.5)	
Marital status	Married	255 (87.0)	
	Single	13 (4.4)	
	Widowed	24 (8.2)	
	Divorced	1 (0.3)	
MET	High	42 (14.3)	5687.82 ± 3182.51
	Moderate	111 (37.9)	1704.32 ± 723.85
	Low	140(47.8)	90.94 ± 173.44
Age (Mean ± SD)		52.90 ± 9.846	
Hba1c (Mean ± SD)		8.67 ± 2.237	
Total calories		8701.65 ± 2005.60	

Table II: DSMQ Sum scale And Subscale.

Variables	Mean ± SD
Glucose Management	8.12 ± 1.88
Dietary Control	5.625 ± 1.406
Physical Activity	2.611 ± 3.841
Health Care	5.907 ± 1.647
Sum Scale	5.920 ± 1.277

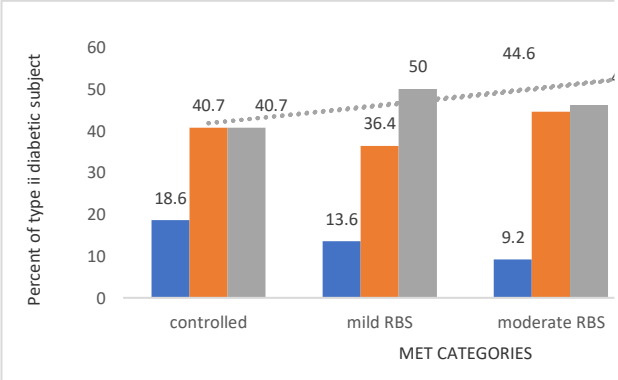

Figure 1. Association of RBS and MET.

Figure 1 is showing the percentages of complications associated with diabetes. 34.8% of the patients with nephropathy, 33.1% with retinopathy, 31.1% with feet ulcer, 25.6% with cardiac problem, 25.3% with stomach problem. 15.7% with frequent infection, 15.7% with skin problem, 12.6% with teeth problem and 8.9% with neuropathy (Figure 2).

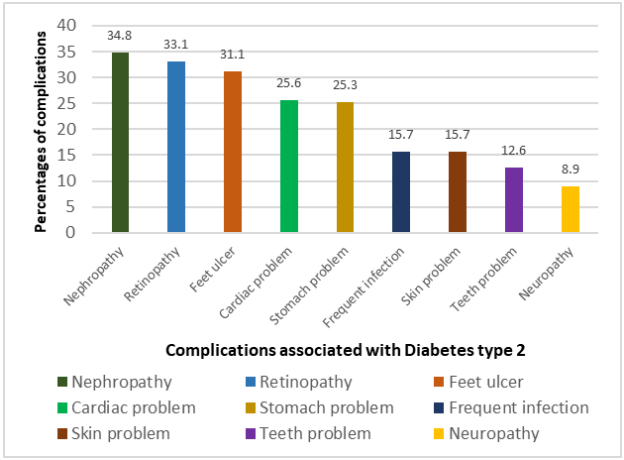

Figure 2. Complications due to Type 2 Diabetes Mellitus

Discussion

This study was aimed to determine tendency of physical activity in Person with type 2 diabetes. Diabetes Self-management Questionnaire (DSMQ) and International Physical Activity Questionnaire (IPAQ) were used to collect the data and statistically analyzed to find out the percentages of physical activity. The current study evaluated the percentages and association of Random Blood Sugar with MET. From the results tendency of physical activity was low in Person with type2 diabetes but number of individuals who was physically active showed very good glycemic control and management of diabetes condition. The strategies of PA significantly decline the risk of death.

In present study according to random blood sugar level in controlled RBS high level of physical activity is high as compared to mild moderate and severe RBS level. A study by Mahmood Sheikh and others in Karachi physical activity halts the risks of diabetes type 2. Exercise can regulate random and fasting blood sugar level and HbA1c.[16] The comorbidities related to diabetes type 2 patients the hypertension was the most common disease encountered by the patients. Hand numbness, obesity and high cholesterol was other comorbidities. Hypertension was 58%, obesity was 27.6% and high cholesterol was 27%. Obesity was more common disease with 77.3% and hypertension was 41.2%.[17] In a previous study in United Arab Emirates by Herbert F Jelinek, 2017 the main comorbidities related with T2DM were hypertension, high level of cholesterol and obesity. In 490 individuals 83.40 % were hypertensive.[18] The strategies of PA significantly decline the risk of death. The influential and non-pharmacological factor is physical activity that improve diabetes condition. Many individuals not accomplish their recommended level of exercise

with high level of blood pressure, overweight and T2DM and other risks.[19]

Limitations of the present study were this was not a generalized study. There was no absolute random blood sugar level value, recall biasness exist as participants elaborated. The study was only conducted in Hazara division. IPAQ was followed which was meant for 7 days record of physical activity which halts the association of HbA1c that was the record of 3 months.

Conclusion

The study concluded that trend of physical activity is low in Person with type2 diabetes of Hazara division of KPK. It revealed the quantitative features of the study i-e frequency and percentages of complications and comorbidities related to diabetes mellitus type 2. It also shows the relationship among Hba1c and RBS with MET. It is concluded that individuals with increased level of RBS and HbA1c were less physically active. The present study shows a direct link of physical activity with glycemic control. It is recommended that the further study should be design in which RBS should be checked on the spot. It is also recommended for further study that record of three months Physical Activity should be taken in account to find out the exact findings of association of HbA1c with Physical Activity.

Conflict of interest: None
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