STUDY OF PHYSICAL ACTIVITY LEVEL AMONG PATIENTS WITH TYPE 2 DIABETES AND ITS RELATION WITH GLYCEMIC CONTROL AND MICROVASCULAR COMPLICATIONS

Magui Abdelmonem Chalach, Mohammed Hassan Hussein Zeitoun, Shimaa Mohamed Elrahmany, Elham Mahmoud Mahdy Mohamed Department of Internal Medicine, Faculty of Medicine, University of Alexandria

INTRODUCTION

Type 2 diabetes (T2DM) is the most common type of DM, representing about 90% of DM worldwide. It is a chronic disorder characterized by hyperglycemia as a result of inadequate insulin secretion frequently on the background of insulin resistance.

Globally, the prevalence of T2DM is rising at an alarming rate. Exercise would seem to be a vital technique for correcting this trend because this epidemic is linked to increases in obesity and physical inactivity.

Physical activity is a general term that includes all movement that increases energy use, while exercise is a more specific form of physical activity that is structured and designed to improve physical fitness.

Physical activity is an essential part of prevention and treatment of T2DM. Studies have shown that regular physical activity can effectively prevent the progression of the disease, improve insulin sensitivity and blood glucose control, improve the quality of life and well-being, contribute to weight loss and reduce cardiovascular risk and overall mortality. Furthermore, regular physical activity lower the incidence of other comorbidities such as hypertension, dyslipidemia and depression.

AIM OF THE WORK

This study was designed to:

Assess the level of physical activity among Egyptian patients with type 2 diabetes mellitus.

Study the relation of physical activity level with the glycemic control in Egyptian patients with type 2 diabetes mellitus.

Study the relation between physical activity level with the microvascular complications in Egyptian patients with type 2 diabetes mellitus.

SUBJECTS AND METHODS

SUBJECTS: This study was conducted on 270 patients with type 2 diabetes mellitus, male or female age > 18 years, any state of glycemic control, and any duration of diabetes. Patients were recruited from the outpatient clinic of the Diabetes unit Alexandria Main University hospital.

Full informed consent was taken from the patients and approval of the ethical committee of the faculty was fulfilled.

METHODS: After giving their signed informed consent; All participants underwent: full history taking, complete physical examination (Vital signs, anthropometric measures, diabetic foot examination including neurological examination, fundus examination by an ophthalmologist), laboratory assessment [fasting plasma glucose (FPG), glycated haemoglobin (HbA1c), total serum cholesterol, high density lipoprotein (HDL-C), low density lipoprotein (LDL-C), serum triglycerides, serum aspartate amino transferase (AST), serum alanine amino transferase (ALT) and urinary albumin creatinine ratio (uACR)] and assessment of physical activity level using the International Physical Activity Questionnaire (IPAQ).

RESULTS

Table 1: Relation between total physical activity category with micro-vascular complications (n = 270)

	Total physical activity category						
	(1	L n = 58)	(n	M = 141)	(n	H = 71)	Test
	No.	%	No.	%	No.	%	
Neuropathy							
Absent	2	3.4	52	36.9	56	78.9	χ
Present	56	96.6	89	63.1	15	21.1	77.
Sig. bet. catg.		p ₁ <0.0	01*,p ₂ <	<0.001*,p ₃ ·	< 0.00	l*	
Fundus							
Ν	8	13.8	109	77.3	68	95.8	χ
DR	50	86.2	32	22.7	3	4.2	110
Sig. bet. catg.		Total physical activity category Test of the second secon					
U-ACR							
Normal (<30)	33	56.9	100	70.9	56	78.9	
Moderately increased (30 – 300)	23	39.7	38	27.0	15	21.1	χ
Marked increase (>300)	2	3.4	3	2.1	0	0.0	ð
Mean ± SD.	57.46 ± 97.35		43.94 ± 65.88		25.25 ± 36.58		
Median		22.10		21.0		11.0	H
(Min. – Max.)	(2.40	(2.40 - 464.0)		(1.60 – 372.0)		(3.20 – 199.0)	
Sig. bet. catg.		p ₁ =0.34	46, p ₂ =	=0.009*, p ₃	=0.030)*	

of Sig. р < 0.001 044^{*} < 0.001 $.026^{*}$ мср= $r^{2} =$ 192 0.057 H = 0.022^{*} 543*

Table 2: Relation between physical act	tivity ca	ategory	and	glycem	nic
control (n = 27	70)				

	Physical activity category				
	L	М	Н	Н	р
	(n = 58)	(n = 141)	(n = 71)		
FBG (mg/dl)					
Mean ± SD.	191.1 ± 72.25	169.5 ± 70.80	171.9 ± 63.61		
Median (Min. – Max.)	168.5	139.0	153.0	5.613	0.060
	(98.0 - 335.0)	(71.0 – 322.0)	(75.0 – 362.0)		
HbA1c (%)					
Mean ± SD.	8.04 ± 1.15	8.04 ± 1.50	8.05 ± 1.39		
Median (Min. – Max.)	8.0	7.60	7.80	1.813	0.404
	(6.40 – 12.20)	(5.50 – 14.20)	(6.10 – 12.60)		

CONCLUSION

From the results of the present study, the following could be concluded:

- There was no statistically significant difference in FPG, HbA1c, mean total serum cholesterol, serum LDL-C and serum HDL according to physical activity category.
- However, serum triglycerides level was significantly higher in the low physical activity category compared to the high physical activity category.
- This real life study suggests a protective role of physical activity against diabetic microvascular complications apart from its impact on glycemic control in patients with T2DM. Thus maintaining healthy active life style is mandatory for these patients.



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