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MEDICINE
كلية الطب



INTERNATIONAL
VIRTUAL 2023
MEDICAL 
RESEARCH
SYMPOSIUM

**SPEARHEADING RESPONSIBLE
RESEARCH & INNOVATION TOWARDS
ACHIEVING SUSTAINABILITY**

7TH & 8TH DECEMBER 2023

ABSTRACT BOOK

PC064

LIPID CONTROL AND ITS ASSOCIATED FACTORS AMONG PATIENTS WITH TYPE 2 DIABETES MELLITUS ATTENDING GOVERNMENT HEALTH CLINICS IN KUANTAN, PAHANG

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Introduction: Studies have shown that type 2 diabetes mellitus (T2DM) and dyslipidaemia were strong predictors of the likelihood that an individual will develop cardiovascular (CV) disease. The main aim of this study was to ascertain the attainment of the primary target in lipid control specifically LDL-cholesterol (LDL-C) among patients with T2DM in primary care settings based on their individualised CV risk according to the latest local guideline. **Materials and method:** This multicentre cross-sectional study was conducted among patients with T2DM attending government health clinics in Kuantan using simple random sampling. The data were collected from the participants' diabetes records. They were also asked to answer two validated questionnaires, International Physical Activity Questionnaire (IPAQ) and Malaysian Medication Adherence Assessment Tool (MyMAAT) to assess for the associated factors. **Results:** A total of 418 participants completed the study. Alarmingly, only 34 (8.1%) achieved the LDL-C target across all CV risk categories. Notably, those who were adherent to lipid-lowering medications and engaged in moderate physical activity were more likely to achieve the lipid target after multiple logistic regression analysis. **Conclusion:** The proportion of lipid control among participants was very low, emphasizing the urgent need for improvement. Promoting the importance of both physical activity and medication adherence is imperative to enhance these outcomes.

Keywords: Lipid control, Type 2 Diabetes Mellitus (T2DM), Medication adherence, Physical activity

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Abstract:

Studies have shown that type 2 diabetes mellitus (T2DM) and dyslipidaemia were strong predictors of the likelihood that an individual will develop cardiovascular (CV) disease. The main aim of this study was to ascertain the attainment of the primary target in lipid control specifically LDL-cholesterol (LDL-C) among patients with T2DM in primary care settings based on their individualised CV risk according to the latest local guideline. **Materials and method:** This multicentre cross-sectional study was conducted among patients with T2DM attending government health clinics in Kuantan using simple random sampling. The data were collected from the participants' diabetes records. They were also asked to answer two validated questionnaires, International Physical Activity Questionnaire (IPAQ) and Malaysian Medication Adherence Assessment Tool (MyMAAT) to assess for the associated factors. **Results:** A total of 418 participants completed the study. Alarmingly, only 34 (8.1%) achieved the LDL-C target across all CV risk categories. Notably, those who were adherent to lipid-lowering medications and engaged in moderate physical activity were more likely to achieve the lipid target. **Conclusion:** The proportion of lipid control among participants was very low, emphasizing the urgent need for improvement. Promoting the importance of both physical activity and medication adherence is imperative to enhance these outcomes.

Introduction:

- The National Health and Morbidity Survey (NHMS) in 2019 reported a diabetes prevalence of 13.4%, with Negeri Sembilan having the highest at 33.2%, followed by Perlis (32.6%), and Pahang (25.7%).¹
- The primary target of lipid control in T2DM patients is LDL-C, with a 1 mmol/L reduction associated with a 22% decrease in CV mortality.²
- Based on the latest local guideline, revised LDL-C targets are <2.6, <1.8 and <1.4 mmol/L for moderate, high and very high-risk categories.³
- According to Malaysian National Diabetes Registry (MNDR) in 2020, LDL-C target attainment <2.6 mmol/L was 46.1%. Nevertheless, it did not reflect the actual performance of lipid control as the registry did not classify the diabetic patients based on their CV risk.⁴
- The main aim of this study was to ascertain the actual achievement of lipid control specifically LDL-C based on their CV risk among patients with T2DM attending government health clinics in Kuantan, Pahang.

Methods:

- Multicentre cross-sectional study was conducted among patients with T2DM attending government health clinics in Kuantan using simple random sampling.
- The data were collected from the participants' diabetes records.
- Two validated questionnaires, International Physical Activity Questionnaire (IPAQ) and Malaysian Medication Adherence Assessment Tool (MyMAAT) also need to be answered by participants to assess for the associated factors.
- A total of 418 participants with T2DM enrolled in this study.

Results:

Table 1 Proportion of lipid control among patients with type 2 diabetes mellitus based on CV risk

	Lipid Control	
	Yes n (%)	No n (%)
Cardiovascular risk		
Moderate risk	0 (0.0)	0 (0.0)
High risk	10 (27.0)	27 (73.0)
Very High risk	24 (6.3)	357 (93.7)
TOTAL	34 (8.1)	384 (91.9)

Table 2 Bivariate analysis of association factors between clinical profile and lipid control

Variables	Lipid control		p
	Yes n (%)	No n (%)	
Body Mass Index in kg/m ² (SD)	27.6 (0.83)	28.9 (0.29)	0.48
HbA1c in % (SD)	7.6 (0.32)	7.8 (0.11)	0.18
Duration of Diabetes in years (SD)	9.7 (0.98)	8.6 (0.33)	0.86
Physical activity (IPAQ)			
Low	18 (52.9)	292 (76.0)	0.01
Moderate	11 (32.4)	62 (16.1)	
High	5 (5.9)	30 (7.8)	
Smoking			
Non-smoker	22 (64.7)	290 (75.5)	0.02
Ex-Smoker	10 (29.4)	46 (12.0)	
Active smoker	2 (5.9)	48 (12.5)	
Combination Lipid Lowering Medication (LLM)			
Monotherapy	33 (97.1)	377 (98.2)	0.49
Dual therapy	1 (2.9)	7 (1.8)	
Statin intensity			
Low intensity	10 (29.4)	128 (33.3)	0.89
Moderate intensity	17 (50.0)	184 (47.9)	
High intensity	7 (20.6)	72 (18.8)	
Duration of statin in years (SD)	8.0 (0.9)	7.1 (0.28)	0.29
Lipid-lowering Medication Adherence (MyMAAT)			
Good adherence	32 (94.1)	230 (59.9)	<0.001
Poor adherence	2 (5.9)	154 (40.1)	

Table 3 Multiple logistic regression analysis of association between the clinical profile of participants with lipid control

Variable	B	Wald	AOR †	95% CI	P
Physical activity (IPAQ)					
Low	1				
Moderate	0.90	4.54	2.45	1.08 – 5.60	0.03
High	0.98	3.07	2.68	0.90 – 8.06	0.08
Smoking					
Non-smoker	1				
Ex-Smoker	1.33	2.56	3.76	0.74 – 10.06	0.11
Active smoker	0.49	0.41	1.64	0.36 – 7.49	0.52
Lipid-lowering Medication Adherence (MyMAAT)					
Good adherence	1				
Poor adherence	-2.17	8.56	0.11	0.03 – 0.49	0.003

Discussion & Conclusion:

- Across all risk categories, the total proportion of individuals achieving lipid control specifically LDL-C is 8.1%.
- Moderate physical activity appears to be significantly associated with the outcome, suggesting a potentially positive impact on the variable being studied.
- The negative association between poor medication adherence and the outcome is particularly strong and statistically significant, highlighting the importance of adherence to lipid-lowering medication in the studied population.
- Poor lipid control achievement indicates a general difficulty in achieving recommended lipid control levels, especially for the very high CV risk group, reflecting potential gaps or challenges in the management of lipid profiles among patients with T2DM in primary care settings.
- In conclusion, the analysis sheds light on the specific challenges within each risk category and emphasizes the importance of tailored interventions to improve lipid control outcomes among patients with T2DM to reduce the risk of developing CV disease.

Acknowledgement:

Funding for this study was provided by the Academy of Family Physician, Malaysia (AFPM/ADMIN/HS/2022/02). The funding body had no role in the study's design, collection, analysis or interpretation of data nor in writing the manuscript.

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