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ORIGINAL ARTICLE

Evaluation of Prevalence of Dyslipidemia and its Pattern in Type II Diabetic Patients in Mirpurkhas

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ABSTRACT

Aim: To probe the existence of dyslipidemia in Type II diabetic patients at Mirpurkhas and to assess different pattern of dyslipidemia in Type II diabetic patients.
Study design: Cross sectional prospective study.
Place and duration of study: Two GP Clinics @ Mirpurkhas, 06 Months from 1st September 2020 to 28th February 2021.
Methodology: Four hundred type II diabetic patients were registered. Complete history and physical examination done for all registered patients. The age, sex, occupation, address, family history of diabetes, addiction was recorded.
Results: There were 241 (60.25%) females and 159 (39.75%) males. The prevalence of dyslipidemia in diabetic males was 58.49% and for females were 58.09%. High triglycerides and low high-density lipoprotein (HDL) were most prevalent pattern of dyslipidemia found in females and high low-density lipoprotein (LDL) followed by low high-density lipoprotein (HDL) was found in males. Overall, low HDL and high TG was most prevalent pattern found.
Conclusion: Dyslipidemia is very prevalent in diabetic patients, and common patterns are hypertriglyceridemia and reduced levels of high-density lipoprotein cholesterol whereas, dyslipidemia may lead to cardiovascular abnormalities in diabetic patients. Optimal control of sugars and cholesterol can play major role in prevention of such sinister complications.
Keywords: Dyslipidemia, Diabetes, Cardiovascular disorders. Prevalence

INTRODUCTION

The rate of diabetes mellitus is multiplying very rapidly in the South Asian population due to socioeconomic factors, the of rate urbanization is increasing day by day, and lifestyle change are getting south Asian population prone to diabetes and related metabolic disorders. Prevalence of diabetes mellitus is increasing many folds in Pakistan in recent decade, our country is in top 10 list of diabetes in world, 17.1% of adults are living with diabetes and they will be at high risk of many live threatening outcomes of diabetes.[1] The rate of urbanization in Pakistan is increasing very rapidly which leads our population to many health challenges particularly non communicable health disorder like respiratory, cardiovascular disorders, cancers and diabetes. Physical inactivity and un healthy patterns of diet are the main reasons for development of metabolic disorders, populations of urban areas are less active than rural population.[2] In South Asia region Pakistan is at highest urbanization rates, 36.4% of population lives in urban areas shown in Population Census 2017. United Nations Population Division estimates that by 2025 nearly half of Pakistani papulation will be living in urban area.

Diabetes is a chronic disease results from relative or definite insulin deficiencies or due to high resistance of insulin in human body, outcomes in high blood sugars which lead to many metabolic abnormalities of lipids, carbohydrates, and proteins. The high levels of insulin resistance can increase the susceptibility to metabolic disorders and cardiovascular disease (CVD) featuring insulin resistance that includes abnormal increased level of blood sugars, hypertension, low level of HDL cholesterol, Triglycerides, and central obesity[3-5].

In diabetic patients, dyslipidemia is a prime factor in developing cardiovascular disease. Low HDL cholesterol and high triglycerides (TG) in combination with increased levels of low-density lipoprotein (LDL) cholesterol are key features of diabetic dyslipidemia. Prolong uncontrolled blood sugar can be deteriorated lipids and lipoprotein abnormalities, commonly elevation of LDL seen in uncontrolled diabetes[6].

Diabetes can increase the predisposition of cardiac events. Diabetic patients are at equal risk of having major coronary disease as the non-diabetic coronary heart disease patients[7]. The frequency of congestive cardiac failure is more prevalent after an acute coronary event in diabetic individual and also the mortality rate is on higher side compare to non-diabetic population. As early as possible dyslipidemia must be pointed out and managed, it is well known modifiable factor which can results in cardiovascular events. In diabetes abnormalities of lipids are common. High concentration of triglycerides, low levels of HDL cholesterol, high LDL cholesterol, increase levels of lipids after meal and the involvement of insulin resistance is associated with high lipids levels[8,9].

By products of triglyceride lipoproteins are atherogenic.[10] Increased levels of triglycerides in blood can "increase the prevalence of coronary heart disease in both diabetic and non-diabetic individuals.[11,12] Unhealthy pattern of eating and sedentary lifestyles can lead to dyslipidemia[13] and also increase the risk of metabolic syndrome in such individual.[14] Coronary artery disease is indirectly relates with pathologic states results from damage of arterial wall by LDL particles results in oxidation[15,16].

The study is designed to evaluate the presence of hypercholesterinaemia and its different types in Type II diabetic patients attending GP clinics in Mirpurkhas District.

MATERIALS AND METHODS

This cross-sectional descriptive study was performed in District Mirpurkhas after permission from IRB from 1st September 2020 to 28th February 2021. Two clinics of General practitioners was selected. Patients was first selected by inclusion and exclusion criteria and after brief information about our research, a written consent were taken from selected participants for study. Complete history and physical examination done for all registered patients. The information was collected age, sex, occupation, address, family history of diabetes, addiction. National Institute of Health Guideline of obesity were used to classify patients according to their Body Mass Index BMI[17]. To diagnose and classification and pattern of dyslipidemia we used guideline from The National Cholesterol Education Program Adult Treatment Panel III[18]. Inclusion criteria for enrolment was all type II diabetics and between age of 30-60, and all patient were excluded if they were type 1 diabetics, whose age was more the 60 year or less than 30 years, pregnant women, known case of ischemic heart disease, known dyslipidemia patients. The data was entered and analyzed through SPSS-25.

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RESULTS

There 241 (60.25%) patients were female and 159 (39.75%) were males (Fig. 1). Mirpurkhas is a rural centered city of Sindh which is reflected in our study results, most of patients belong to rural areas 216 (54%) and urban 184 (46%) [Fig. 2]. According to body mass index, 130 patients were normal weight, 117 were overweight and 140 (35%) were obese (Table 1). Study participants from rural area 31% are obese and from urban areas the percentage is little higher 39.1% (Fig. 3).

Both female and male participants showed not got control of diabetes reflected by levels ofHbA1c, total of 319 patients HbA1c was more than7.5 and mean in males 8.7 and in females 8.9, which considered high level by most guideline available of diabetes control to prevent further complications of diabetes. Most of the study subjects got uncontrolled fasting blood glucose levels. 73% of study subjects found to have abnormal levels of fasting blood glucose, which is also reflected by high level of HbA1c (Table 2). The prevalence of dyslipidemia in diabetic males was 58.49% and for females were 58.09% (Fig. 4).

High triglycerides and low high-density lipoprotein (HDL) where most prevalent pattern of dyslipidemia was found in females and in male finding was high low-density lipoprotein (LDL) followed by low high-density lipoprotein (HDL). Low level of HDL plus high level of triglycerides and high level of low-density lipoprotein is most prevalent pattern found (Table 3).

Table 1: Frequency of body mass index

Body Mass Index	No.	%age
Under weight	13	3.5
Normal weight	130	32.4
Over weight	117	29.1
Obese	140	35.0

Table 2: Frequency of HbA1c

HbA1c	No.	%age
<7.5	81	20.25
>7.5	319	79..75

Table 3: Characteristics of different pattern dyslipidemia according to genders

Type of cholesterol	Male	Female
High level of LDL cholesterol	13 (13%)	18 (10.11%)
Low HDL cholesterol	11 (11%)	26 (14%)
High Level of TG	2 (2%)	1 (0.56%)
High TG + High LDL + Low HDL	44 (44%)	91 (51.10%)
Low HDL + High LDL	19 (19%)	32 (19.9%)0
Low HDL + High TG	11 (11%)	10 (5.62%)

Fig. 1: Frequency of genders

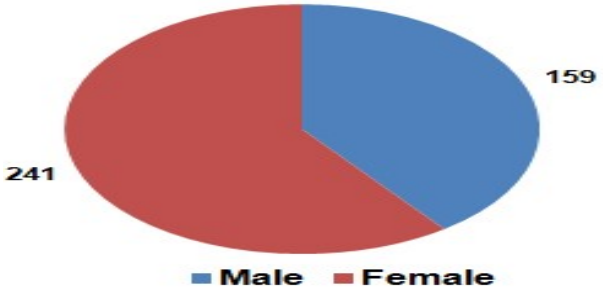


Fig. 2: Study population according to area

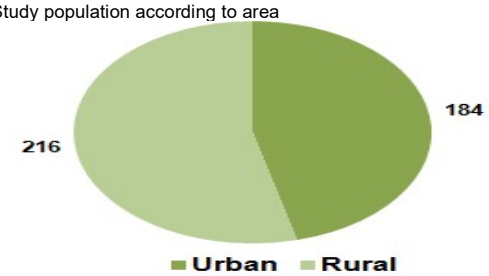


Fig. 3: Distribution of obesity among rural and urban areas

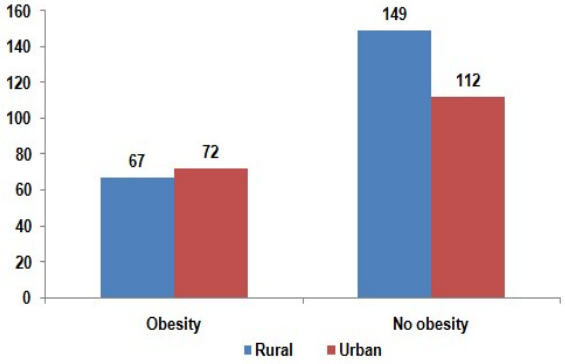
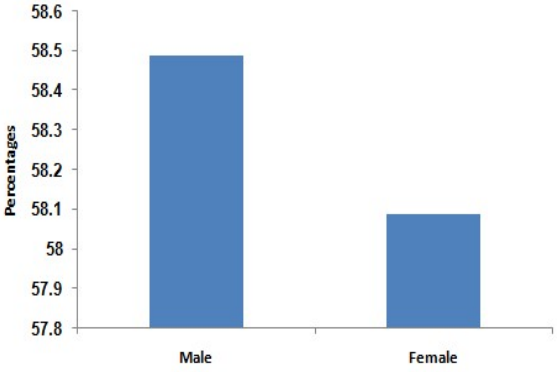


Fig. 4: Frequency of prevalence in gender



DISCUSSION

There were 241 patients have high levels of cholesterol which is above the normal limits set by different guidelines available for care of diabetic patients[19]. The results of this is not that unalike from some studies done in recent decade[20,21]. The high level of HbA1c in both male and females seen in our study, the persistent high levels of blood sugar can contribute to changes in micro levels of arterial wall which may lead to cardiovascular events and cerebro-vascular diseases. The optimum control of sugar levels is must to avoid micro and macro vascular complication of diabetes.[22] Good diabetic control can increase the quality of life and also decease the financial burden of this disease[23]. High mortality rate is associated with diabetic dyslipidemia[24,25]. It is recommended that every patient must take good care of his/her sugar and lipid level by opting the healthy life style and diabetic also use the lipid lowering drugs.

CONCLUSION

The results of this study show high prevalence of dyslipidemia in diabetic patient of district Mirpurkhas and the mix type of dyslipidemia Low HDL, High TG, High LDL is commonest, so it is needed to manage and diagnose the diabetic dyslipidemia to avoid further Cardiovascular disorders.

Conflict of interest: Nil

REFERENCES

1. Atlas ID. 9th ed. International Diabetes Federation 2019.
2. Rajaraman D, Correa N, Punthakee Z, Lear SA, Jayachitra KG, Vaz M, et al. Perceived benefits, facilitators, disadvantages, and barriers for physical activity amongst South Asian adolescents in India and Canada. J Physical Activity Health 2015;12(7):931-41.
3. Jl J. Harrison's endocrinology. 2nd ed. New York: Chicago 2010 2010.
4. Habib SS. Frequency distribution of atherogenic dyslipidemia in Saudi type 2 diabetic patients. Pak J Physiol 2006;2(2):31-4.

5. Mooradian AD. Dyslipidemia in type 2 diabetes mellitus. Nature Rev Endocrinol 2009;5(3):150-9.
6. Grundy SM. Hypertriglyceridemia, insulin resistance, and the metabolic syndrome. Am J Cardiol 999;83(9):25-9.
7. Haffner SM, Lehto S, Rönnemaa T, Pyörälä K, Laakso M. Mortality from coronary heart disease in subjects with type 2 diabetes and in nondiabetic subjects with and without prior myocardial infarction. NEJM 1998;339(4):229-34.
8. Thapa SD, KC SR, Gautam S, Gyawali D. Dyslipidemia in type 2 diabetes mellitus. J Pathol Nepal 2017;7(2):1149-54.
9. Miettinen H, Lehto S, Salomaa V, Mähönen M, Niemelä M, Haffner SM, et al. Impact of diabetes on mortality after the first myocardial infarction. Diabetes Care 1998;21(1):69-75.
10. Car J, Patel H, Srishanmuganathan J, Majeed A. Diabetes care in developing countries. CMAJ 2007;176(2):209-12.
11. Hu FB, Stampfer MJ, Haffner SM, Solomon CG, Willett WC, Manson JE. Elevated risk of cardiovascular disease prior to clinical diagnosis of type 2 diabetes. Diabetes Care 2002; 25(7): 1129-34.
12. Sridhar G. Diabetes in India: Snapshot of a panorama. Curr Sci 2002;83(7):791-8.
13. Khatib NM, Quazi ZS, Gaidhane AM, Waghmare TS, Goyal R. Risk factors of type-2 diabetes mellitus in rural Wardha: A community based study. International J Diabetes Developing Countries 2008;28(3):79.
14. Mitra A, Bhattacharya D, Roy S. Dietary influence on TYPE 2 Diabetes (NIDDM). J Human Ecol 2007;21(2):139-47.
15. Goldfine AB, Beckman JA. Life and death in Denmark: lessons about diabetes and coronary heart disease. Am Heart Assoc 2008.
16. Kuusisto J, Mykkänen L, Pyörälä K, Laakso M. NIDDM and its metabolic control predict coronary heart disease in elderly subjects. Diabetes 1994;43(8):960-7.
17. Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults - The Evidence Report. National Institutes of Health. Obesity Res 1998;6 Suppl 2:51s-209s.
18. Detection NCEPEPo, Adults ToHBCi. Third report of the National Cholesterol Education Program (NCEP) Expert Panel on detection, evaluation, and treatment of high blood cholesterol in adults (Adult Treatment Panel III): The Program; 2002.
19. Glycemic Targets: Standards of Medical Care in Diabetes 2021. Diabetes Care 2021;44(Suppl 1):S73-s84.
20. Zaid M, Hasnain S. Plasma lipid abnormalities in Pakistani population: trends, associated factors, and clinical implications. Brazilian J Medical Biol Res 2018;51(9).
21. Shafique S, Mirza D, Shawana S, Tabassum S, Faraz N. Frequency of dyslipidemia in type 2 diabetic patients in Karachi. J Bahria Univ Med Dent Coll 2019;9(2):133-6.
22. Chowdhury S. COVID 19 & Diabetes: Latest Guidelines from the IDF2020.
23. Herman WH. The global burden of diabetes: an overview. Diabetes mellitus in developing countries and underserved communities. 2017:1-5.
24. McEneny J, O'Kane M, Moles K, McMaster C, McMaster D, Mercer C, et al. Very low density lipoprotein subfractions in Type II diabetes mellitus: alterations in composition and susceptibility to oxidation. Diabetologia 2000; 43(4):485-93.
25. Rajput DPS, Shah JY, Singh P, Jain S. Evaluation of dyslipidemia in type 2 diabetes mellitus. Asian J Med Sci 2015;6(6):16-9