FREQUENCY OF HYPERLIPIDEMIA IN THE DIAGNOSED TYPE 2 DIABETICPATIENTS

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ABSTRACT:

OBJECTIVES:

The primary event in the development of Type-2 diabetes is directly associated with lipid metabolism derangement occurring due to insulin resistance. The aim of this study was to find out the prevalence of hyperlipidemia in the newly diagnosed Type-2 Diabetes

METHODOLOGY:

This hospital based descriptive study was conducted in the year 2018 to 2019, on 100 newly diagnosed Type-2diabetic patients attending medical O.P.D or admitted in medial wards of Naseer Ullah Khan Babar Memorial Hospital Kohat Road Peshawar. Informed consent was taken from all those patients who fulfilled inclusion criteria and were enrolled in the study. Detail history regarding basic demographic characteristics and complaints that suggest diabetes, or its complications was documented. History of risk factors like blood pressure, smoking or history of having diabetes in family was also noted. Descriptive statistics were used, where applicable. Categorical data was represented by using charts. Continuous variables were described as mean with standard deviation. SPSS version 20 was used for all analysis.

RESULTS:

The incidence of hyperlipidemia in newly diagnosed diabetic patients was 29%. About 71% patients were having normal lipid profile. Our study also revealed that the frequency of hyperlipidemia increases with age. Half of the patients having age more than 60 years developed hyperlipidemia. Among hyperlipidaemic patients, hypercholesterolemia was present in 36% and hypertriglyceridemia in 64% patients

CONCLUSION:

The study suggests that Hyperlipidemia is very common in newly diagnosed Type-2 diabetes patients in this part of the world.

KEYWORDS: *Hyperlipidemia, Hypertriglyceridemia, Metabolism, Hypercholesterolemia, Type-2 Diabetes*

How to cite this article:

Iqbal S, Gui A, Ahmad R, Haq M, Maryam S, Rahman S. Frequency of Hyperlipidemia in the Diagnosed Type 2 Diabetic Patients. J Gandhara Med Dent Sci. 2021;8(1):25-30

https://doi.org/10.37762/jgmds.8-1.122

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INTRODUCTION:

The primary event in the development of type-2 diabetes is directly associated with lipid metabolism derangement occurring due to insulin resistance[1].

For good care of diabetic patient, it is necessary to control both blood glucose and lipid levels[2]. It has been observed that about one third patients of this metabolic disorder remain undiagnosed. Thus, newly diagnosed patients usually present with some major micro or macro vascular complication at the time of presentation[3]. Diabetic patients are twice more costly to

manage than non-diabetic patients, mainly due to the high cost associated with diabetic complication[4]. Increase glucose level is responsible for both metabolic and microvascular complications[5]. Macrovascular complications arise because of insulin resistance. Resistance to insulin action disturbs glucose and fat metabolism, by increasing the level of inflammatory cytokines and free fatty acids in blood. This leads to high production of glucose by liver; decrease transport of glucose into muscle cells, high fat's breakdown and increased accumulation of lipids in liver and smooth muscle[6,8]. Beside this, it also causes high levels of glucagon and glucose dependent insulinotropic polypeptide[8,9]. Thus,resulting in hyperglycemia and deranged lipid profile. Single nucleotide polymorphisms (SNP) and different types of genetic variant are also reported to be responsible for impaired beta cell function and resistance to insulin action[10]. The rationale of this study is to find out the prevalence of hyperlipidemia in the newly diagnosed type-2 OM and to give awareness for early detection and management of hyperlipidemia, which will lead to reduction in total mortality and cardiovascular events in the newly diagnosed type-2 OM. The objective of the proposed work is to find out the prevalence of hyperlipidemia in the newly diagnosed type-2 OM.

METHODOLOGY:

The present study was conducted in medical department of Naseer Ullah Khan Babar Memorial Hospital Kohat Road Peshawar from July 2018 to June 2019 on 100 newly diagnosed type-2 diabetic patients attending medical O P D or admitted in medial ward of Naseer Ullah Khan Babar Memorial Hospital Kohat Road Peshawar. Informed consent was taken from all those patients who fulfilled inclusion criteria and were enrolled in the study. Detail history regarding basic demographic characteristics and complaints that suggest diabetes, or its complications was documented. History of risk factors like blood pressure, smoking or history of having diabetes in family was also noted. After history, complete general and systemic examination of the patients was performed. Detail was recorded on proforma. Blood sample was collected after 12 hours of fast. Venipuncture of the forearm was done under aseptic condition and 5ml of blood sample was collected. The blood sample was then centrifuged at 4000 rpm for 5 minutes. The serum thus, obtained was analysed in auto chemistry analyser for fasting blood glucose, cholesterol and triglycerides. The fasting blood glucose, serum triglycerides and total cholesterol were measured by using colorimetric method. All patients of both gender coming to the Medical O P D or admitted in the medical unit of Naseer Ullah Khan Babar Memorial Hospital. Patients were labelled as newly diagnosed type-2 OM, who were having more than 126 mg/di fasting blood glucose or having random blood glucose more than 200 mg/di along with hyperglycemia symptoms. Patients with fasting blood cholesterol ≥240 mg/dl and fasting blood triglyceride ≥165 mg/dl were labelled as having hyperlipidemia. All patients having history of lipid disorders as well as patients who are unable to provide informed consent. Descriptive statistics were used, where applicable. Categorical data was represented by using charts. Continuous variables were described as mean with standard deviation. SPSS version 20 was used for all analysis.

RESULTS:

In our study out of 100 newly diagnosed type-2 diabetes mellitus, 60% were male and 40% were female patients. Female to Male ratio was 1.5 (Figure-1). Age range of patients included in study was from 29-69 years. The most frequent age range was between 50-61 years. The Mean ± SD age at presentation was 49.95 ± 9.88 years (Table-1). The incidence of hyperlipidemia in these newly diagnosed diabetic patients was 29%. About 71% patients were having normal lipid profile (Figure-2). Our study also revealed that the frequency of hyperlipidemia increases with age. Half of the patients having age more than 60 years developed hyperlipidemia. The percentage of hyperlipidemia in various age group of our study is shown in Table 2. In present study we also found that hyperlipidemia incidence was 35% in women and 25% in men. But statistically the high incidence was not significant with p-value 0.280 (Table 3). We further observed (Figure 3) that out of 29 hyperlipidemia patients, hypercholesterolemia was present in 10(36%) and hypertriglyceridemia in 19 (64%) patients.

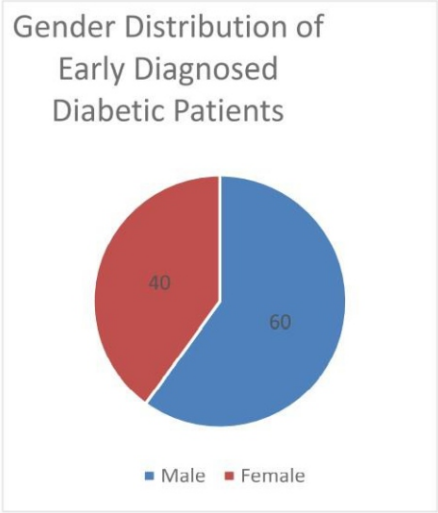

Figure 1: Gender Wise Distribution ofEarly Diagnosed Diabetic Patients

Table 1: Age presentation of Subjects with Newly diagnosed Type-2 Diabetes

Age Range	Frequency	Percentage	Cumulative Percentage
29-40	18	18%	18.0
41-50	27	27%	45.0
51-60	41	41%	86.0
61+	14	14%	100.0
Total	100	100%	

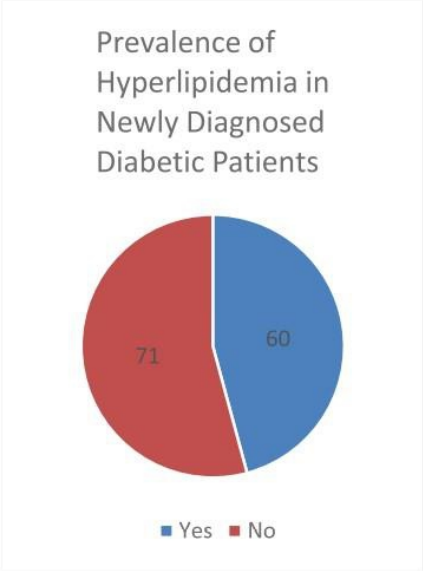

Figure 2: Prevalence of Hyperlipidemia in Newly Diagnosed Diabetic Patients

Table 2: Prevalence of Hyperlipidemia in Different Age Group of Patients Having Newly Diagnosed Type-2 Diabetes

		Hyperlipidemia		Total	P-Value
Age (in years)	29-40	1 5.6%	17 94.4%	18 100%	0.033
	41-50	10 37%	17 63%	27 100%	
	51-60	11 26.8%	30 73.2%	41 100%	
	61+	7 50%	7 50%	14 100%	
Total		29 29%	71 71%	100 100%	

Table 3: Incidence of Hyperlipidemia in Male and Female Subjects Having Newly Diagnosed Type-2 Diabetes

		Hyperlipidemia		Total	P-Value
		Present	Absent		
Gender	Male	15 25%	45 75%	60 100%	0.280
	Female	14 35%	26 65%	40 100%	
Total		29 29%	71 71%	100 100%	

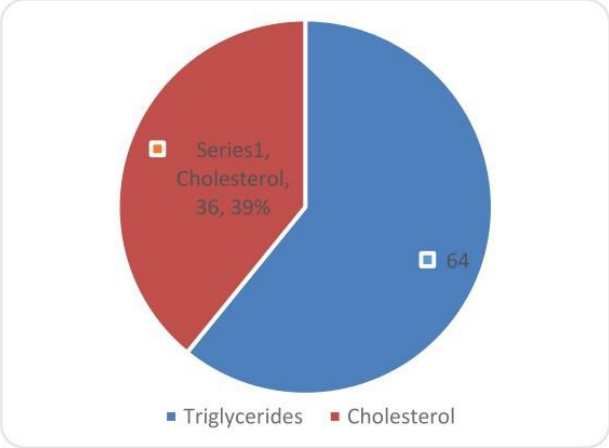

Figure 3: Distribution of Various Lipids in Hyperlipidemics Subjects

DISCUSSION:

In our study, which is one of the first studies in this regard in Peshawar, we assessed the incidence of hyperlipidemia among Type-2 DM subjects who were newly diagnosed. Hyperlipidemia was reported in 29% patients in whom hypertriglyceridemia was present in 56% and hypercholesterolemia in 36% patients. Our study results are in agreement with almost similar Iranian study that reported hyperlipidemia among 73.5% subjects[12]. Hypertriglyceridemia was the most common phenotype pattern of hyperlipidemia, 56% in our study. Our data is in agreement with the findings of a study which has shown that in newly diagnosed Type-2 DM the frequency of hypertriglyceridemia is significantly high, reporting it to be 58% in patients[11]. Similarly report of the United Kingdom Prospective Diabetes Study (UKPDS) has shown that in newly diagnosed diabetic patient's triglyceride's level are 50% higher than non-diabetic individual[13]. Ning et al study report shows that hypertriglyceridemia act as independent risk factor in Type-2 DM[14]. In our study in newly diagnosed diabetic patients hypercholesterolemia is present in 36% patients[13]. Data of United States National Health and Nutritional Examination Survey (NHANES) reveals that hypercholesterolemia is present in more than 50% diabetic patients[13]. In Indonesia work of Soebardi S et al on newly diagnosed diabetic patients shows high prevalence of hypercholesterolemia 66.1% as compared to our study. They further observed that the increase level of triglycerides and cholesterol in these newly diagnosed diabetic patients increase CVD risk several folds as compared to non-diabetic population, but most of them do not realize these risk[15]. Thus, by early detecting and treating hyperlipidemia we can reduce the complications of hyperlipidemia in significant number of patients. The most frequent age of presentation in the present study is 51-60 years. Hence, to reduce incidence of diabetes in the specific age group, special preventive and promotive health services are needed. Our study also showed that prevalence of hyperlipidemia increases with age; about 50% of newly diagnosed Type-2 DM with hyperlipidemia has age above 60 years. This data is in agreement with Burchfiel et al whose study showed that in older people with Type-2 DM the prevalence of hyperlipidemia, hypertension, obesity, sedentary lifestyle are 2-4 times more common[16].

We can significantly improve and increase their life span by diagnosing and treating lipid abnormalities[17]. In present study hyperlipidemia incidence is more in female 35% compared to males 25%. In 2015 result of cross-sectional study conducted in India also shows high level of serum cholesterol and triglycerides in female diabetic patients compared to males[18]. Although in our study statistically it is not significant but this high prevalence of hyperlipidemia in females can be due to decrease physical activity, obesity and increasing age. As in females with increasing age due to lack of estrogen hormone the risk of having derange lipid profile increase[19]. Moreover, women with obesity have high incidence of hyperlipidemia[20]. However, further research is needed to address more potentially the risk factors that can be associated with derange lipid profile in newly diagnosed diabetic female patients. Moreover, early screening and management of newly diagnosed Type-2 DM for hyperlipidemia is strongly recommended. The relationship between diabetes and hyperlipidemia is well established. However new finding in our study is that 29% of the subjects having hyperlipidemia are diagnosed diabetic for the first time and are without any cardiovascular disease. Keeping in view such a huge number of newly diagnosed diabetic patients with hyperlipidemia, we should focus on its primary prevention. Primary prevention studies such as the West of Scotland study found a 20% decrease in total mortality tending toward statistical significance[21]. Mass media should be involved to provide awareness in general public about hyperlipidemia and its related complications in newly diagnosed diabetes. Screening of every newly diagnosed diabetic patient for hyperlipidemia should be performed. Community physician should be encouraged to give early attention to the management of lipid disorders in their diabetic subjects. In such a way, we can reduce morbidity and mortality up to 20% in diabetic patient and increase their survival rate.

CONCLUSION:

Our study suggests that hyperlipidemia is very common in newly diagnosed Type-2 diabetic patients in this part of the world.

RECOMMENDATIONS:

For proper management, the following guidelines can be helpful to reduce hyperlipidemia incidence and its complications. The optimal care of diabetic patients should include serum lipid profile in addition to routine monitoring of blood sugar. Aggressive lifestyle changes like physical exercise; weight reduction and lipid lowering diet should be initiated followed by lipid lowering drugs. The proper treatment with anti-diabetic drugs should go hand in hand

with lipid lowering drugs. In order to meet future challenges, we should create awareness in general public health regarding hyperlipidemia in newly diagnosed diabetic patients. Special screening program for lipids should be launched in high-risk individuals like female gender and advance age. By screening, diagnosing and early treating hyperlipidemia in newly diagnosed Type-2 diabetic patients we can enhance the prevention of coronary artery disease, improve their health and increase their life span.

CONFLICT OF INTEREST: None

FUNDNG SOURCES: None

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CONTRIBUTORS

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