Original Article

Frequency of Pre Diabetes in Patients with Positive Family History at Tertiary Care Hospital

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ABSTRACT

Objective: To find out the frequency of pre-diabetes in patients with positive family history at People's Medical College Hospital Nawabshah.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the Medical Department and Medical OPD of People's Medical College Hospital Nawabshah from January 2018 to January 2019.

Materials and Methods: A total of 70 patients having one or more than one risk factors like history of diabetes mellitus, obesity, hypertension, low HDL and hypertrigly ceridemia were included in this study. Blood samples were taken for overnight 8 hours fasting blood glucose estimation. If it was impaired, per oral 75 grams of glucose was given to them and blood samples after two hours for glucose tolerance test.

Results: A total of 70 patients were included in this study. There were 40(57.14%) males and 30(42.86%) females as presented in figure 5. Age ranged from 30 to 45 years. 15 (21.42%) patients aged from 30 to 35 yearts. 20 (28.57%) patients were of 36 to 40 years and 35(50%) patients age was from 41 to 45. Rate of pre diabetes was seen to be higher among those who had family history of D.M. 40 (57.14%) patients had positive family history. Next risk factor was hypertension (B.P > 140/90 mmHg) seen in 15(21.42%) patients. Hypertriglyceridemia was in 10 (14.28%) patients and hypercholesterolemia was in 5 (7.14%) patients

Conclusion: The most common risk factor for developing Diabetes Mellitus is positive family history of Diabetes Mellitus then next is the hypertension and last one is the cholesterol level or obesity.

Key Words: Pre-diabetes, Type 2 diabetes, Hypertriglyceridemia, Hypercholesterolemia

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INTRODUCTION

Pre diabetes is defined as the state in which glycaemic parameters are at or above the normal level but below the diabetic threshold including the impaired fasting glucose and impaired glucose tolerance.[1]These persons usually develop type 2 diabetes within a decade. International Diabetic Federation has estimated the rise in diabetes up to 552 million by 2030 A.D which predicts that 3 persons will develop diabetes within ten seconds and 10 million per year.[2]It is proved that 183 million people even don't know about their disease of Diabetes Mellitus (D.M). In South Asia, 120.9 million people will develop D.M by 2030.[2]

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Many studies including study of Butler show that obese people with impaired fasting glucose (IFG) had deficiency of Beta cell of pancreas. Prediabetes usually converts into diabetes within a few years.[3] This was proved by study of Nichols findings which showed 1.3% newly diagnosed patients developed Diabetes Mellitus at 41.4 months whereas previously diagnosed patients developed this disease at 29 months.[4] Recent diabetes prevention prospective study in China showed that incidence of diabetes in prediabetics was 90%.[5] Pakistan is sixth of Top Ten countries having Diabetes Mellitus. It is expected to be 4th with 15 million people suffering from DM by the year 2025.[6,7]

People with pre diabetics have not only increased risk of D.M but also are vulnerable to develop cardiovascular diseases. Some studies show that free fatty acids and insulin resistance with prediabetics promote coronary artery atherosclerosis.[8,9]

The rationale of our study is to find out the rate of pre diabetes among population in order to make it necessary to do screening with risk factor, early detection of pre diabetes and its management with modification of life style, diet, regular exercise and prevention of obesity.

MATERIALS AND METHODS

This is a comparative study of 70 patients admitted through Emergency/ Medical Outpatient department (MOPD) in medical Department of Peoples Medical College Hospital Nawabshah This study was conducted from January 2018 to January 2019.This is tertiary care hospital receiving and treating the patients of not only but also other provinces of Pakistan.

All the patients admitted had positive family history of Diabetes mellitus and hypertension as considered high risk to them. Both genders were included in study. Age ranged from 30 to 45 years.All diagnosed patients of type 1 and type 2 D.M were excluded from the study.

First degree healthy relatives of patients with known risk factors for diabetes mellitus were admitted from Medical wards and MOPD of People's Medical College Hospital. A detailed medical history regarding first degree relative with known risk factors either one or more than one for diabetes like family history, hypertension, hypercholesterolemia and obesity was taken Blood samples were taken for overnight 8 hours fasting blood glucose, if it is impaired then 75 grams of glucose was given them orally and blood samples after two hours for glucose tolerance test. These samples was collected in test tubes containing no preservative and transported within half hour to People's Medical College Hospital Laboratory.

Frequency, proportion and percentage were computed for qualitative variables like sex, family history, prediabetes in first degree relatives. Mean and standard deviation were computed for quantitative variables like age, BMI, blood pressure, HDL level and triglyceride level. Stratification was done to control effect modifiers like age, gender, history of first degree diabetes, obesity, hypertension, low HDL and Hyper-triglyceridemia to observe an outcome.

RESULTS

A total of 70 patients were included in this study. There were 40(57.14%) males and 30(42.86%) females as presented in figure 5. Age ranged from 30 to 45 years. 15 (21.42%) patients aged from 30 to 35 yearts. 20 (28.57%) patients were of 36 tp 40 years and 35(50%) patients age was from 41 to 45 as is shown in table 1 below.

Both genders were included in this study. 40(57.14%) males and 30 (42.58%) females were studied according to risk factors for D.M.

Rate of pre diabetes was seen to be higher among those who had family history of D.M. 40 (57.14%) patients had positive family history. Next risk factor was hypertension (B.P > 140/90 mmHg) seen in 15(21.42%) patients. Hypertriglyceridemia was in 10 (14.28%) patients and hypercholesterolemia was in 5 (7.14%) patients as is shown in table 2.

Table No.1: Age Distribution

S.No	Age	No of patients	Percentage
1	30 -35	15	21.42%
2	36-40	20	28.58%
3	41-45	35	50%
total		70	100%

Table No.2: Risk factor

S.No	Risk factor	No of patients	Percentage
1	D.M	40	57.14%
2	HTN	15	21.42%
3	Hypertrigly-ceridemia	10	14.28%
4	Hypercho-lesterolemia	5	7.14%
Total		70	100%

DISCUSSION

D.M is rampant in the globe nowadays particularly type 2 irrespective of sex difference. Its risk enhances as age enters into its 4th decade but can occur at any age mostly due to change in life style, diet, physical activity and obesity.[10] In our study the average age was 38.57±5.03 years. National Diabetes Prevalence survey of Pakistan showed prevalence upto 11% whereas another survey report of New Castle Heart Project on adults aged 25 years showed prevalence of pre diabetes among 23.4% in South Asia.[10] NHANES-III showed that in overweight adults aged above 45 years, 45.9% had abnormal metabolism of glucose. Out of these,12.5% reported Diabetes by self, 10.8% were not diagnosed for diabetes earlier and 22.6% had prediabetes .It is also observed that most of increase in diabetes prevalence occur in developing countries with the rate of 170% increase and by the year 2025 about 75% of all persons with diabetes will be living in third world countries. In our study, rate of prediabetes due to obesity is from 7.14% to 14.28%. [12]

According to survey conducted in China in 2010, the prevalence of prediabetics was estimated to be greater than 57% in old persons. Incidence was higher in rural population as compared to rural. But in our study, incidence is higher in middle aged people but not in old ones.[13]

In NHANESIII prevalence of prediabetes was high (44.3%) in person with positive family history of diabetes. same was observed in our study. The rate of prediabetes with positive family history was 57.14%.[14]

In our study, systolic and diastolic blood pressure increased from normal to prediabetes to undiagnosed diabetes. Masoumeh Sadeghi et al and A. Basit also showed similar association of blood pressure to prediabetes and diabetes.[15]

In Shaikh et al study, HDL cholesterol level decreased from normal in prediabetes to undiagnosed diabetes

while the triglyceride level increased. Type 2 diabetics often have elevated triglyceride and depressed HDL cholesterol. But in our study, increased triglycerides were found in 10 (14.28%) and hypercholesterolemia was found in 5 (7.14%) Akiko S Hosler reported prevalence of prediabetes in high risk group including Age ≥45 years=11.3%, BMI ≥25.0 kg/m2=8.0% and Family history=9.6%.Joshi SR et al reported association of diabetes and hypertension which were 18.4%[9]. In our study, patients with positive family history were 57.14%.[16]

CONCLUSION

It is concluded that the most common risk factor for developing Diabetes Mellitus is positive family history of Diabetes Mellitus then next is the hypertension and last one is the cholesterol level or obesity.

Author's Contribution:

Concept & Design of Study:	Muhammad Zarar
Drafting:	Shahzad Memon, Arslan Badar Shaikh
Data Analysis:	Mujahid Ali Chandio, Anwar Ali Jamali, Ruqayya Farhad
Revisiting Critically:	Muhammad Zarar, Shahzad Memon
Final Approval of version:	Muhammad Zarar

Conflict of Interest: The study has no conflict of interest to declare by any author.

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