INTRODUCTION

Disordered glucose metabolism leads to prediabetes which does not satisfy the diagnostic criteria of diabetes mellitus. Prediabetes is a risk factor for development of diabetes along with cardiovascular and microvascular complications. Overweight or obese adults of any age, first degree relative with DM, physical inactivity, high risk race/ethnicity, gestational DM, hypertension (HTN), hypercholesterolemia, hypertriglyceridemia, polycystic ovarian syndrome (PCOS) etc. are various risk factors for the development of insulin resistance and prediabetes like overweight or obese adults of any age, first degree relative with DM, physical inactivity, high risk race/ethnicity, gestational DM, hypertension (HTN), hypercholesterolemia, hypertriglyceridemia, polycystic ovarian syndrome (PCOS) etc.

In 1997, The Expert Committee on the Diagnosis and Classification of Diabetes Mellitus extended the concept by recognizing patients with impaired fasting glucose (IFG) along with impaired glucose tolerance (IGT). Both categories (IGT and IFG) were referred as prediabetes and considered as a substantial risk factors for progression to diabetes.2

ABSTRACT

Background: Disordered glucose metabolism leads to prediabetes which does not satisfy the diagnostic criteria of diabetes mellitus. Prediabetes is a risk factor for development of diabetes along with cardiovascular and microvascular complications. There are various risk factors for development of insulin resistance and prediabetes like overweight or obese adults of any age, first degree relative with DM, physical inactivity, high risk race/ethnicity, gestational DM, hypertension (HTN), hypercholesterolemia, hypertriglyceridemia, polycystic ovarian syndrome (PCOS) etc.

Materials & Methods: The present study was performed at Pt. B. D. Sharma PGIMS, Rohtak includes screening of hundred patients. Thirty three patients of age group 20-40 years were categorized as prediabetic on the basis of HbA1c (5.7-6.4%). Sixty seven were categorized as controls. Venous blood samples were obtained for estimation of hemoglobin & HbA1c after taking written consent. Samples were processed by centrifugation and analysed on the same day.

Results: In our study, out of 33 cases, 1 (3%) belongs to age group between 26-30 years, 11 (33.3%) between 31-35 years and 21 (63.6%) between 36-40 years. Out of 33 cases, 25 were females (75.76%) and 8 were males (24.24%).

Conclusion: Occurance of prediabetics cases increases with age and more in female in comparison to males.
In Impaired Fasting Glucose (IFG), hepato-renal insulin resistance is present. Basal insulin secretion and first phase insulin release is impaired leading to fasting hyperglycemia. In Impaired Glucose Tolerance (IGT), peripheral insulin resistance occurs. First and second phase insulin release is impaired leading to postprandial hyperglycemia. In combined IFG and IGT, defects in insulin secretion and sensitivity becomes additive indicating the fact that IFG and IGT are distinct metabolic entity.

Thus, development of preDM is linked to environmental factors such as physical inactivity but the subsequent development of diabetes is due to combination of both genetic and environmental factors. Therefore to prevent diabetes, efforts should be initiated prior to the development of preDM in order to obtain the maximum benefit.

**Aim & Objectives**

To study the occurrence of prediabetes according to age and gender.

**MATERIAL AND METHODS**

The present study was conducted in the Department of Biochemistry in collaboration with Department of Medicine, Pt B D Sharma PGIMS, Rohtak. Hundred patients who attended the medicine OPD were screened. Screening was done in patients of age group between 20-40 years. According to ADA criteria, based on HbA1c, out of hundred patients 33 were categorized as cases and 67 as controls.

**Inclusion criteria**

ADA criteria of prediabetes is:

1. Impaired fasting glucose (IFG) with fasting plasma glucose levels of 100 to 125 mg/dL (5.6 to 6.9 mmol/L).
2. Impaired glucose tolerance (IGT) with plasma glucose levels of 140 to 199 mg/dL (7.8 to 11.0 mmol/L) 2-hour postprandial.
3. HbA1c of 5.7 to 6.4%.

**Exclusion criteria**

1. Patients with hemoglobin < 9 gm% and any history suggestive of hemoglobinopathies.
2. Patients with history suggestive of endocrine disorders like thyroid, adrenal and pituitary glands disorders.
3. Patients with history suggestive of any drug intake affecting glucose metabolism.

**Selection of controls**

Healthy age matched individuals not satisfying the criteria of prediabetes were enrolled as controls.

**Sample collection**

For estimation of hemoglobin and HbA1c, 2 mL of blood was collected in EDTA anticoagulant vacutainer. Samples were processed and analysed on the same day.

**METHODOLOGY**

After getting written consent from the cases and controls, detailed history was taken and recorded in their respective proforma. Hemoglobin estimation was done by acid haematin method using Sahli’s hemoglobinometer. HbA1c was determined by turbidimetric inhibition immunoassay (TINIA) for hemolyzed whole blood.

**Statistical Analysis**

1. All the analyses were performed by using the statistical package (IBM SPSS 20).
2. Primary outcome were calculated by applying Unpaired ‘t’ test between the variables of cases and controls.
3. Data were considered to be significant if p < 0.05 and highly significant with p < 0.001.

**RESULTS AND OBSERVATIONS**

In our study, out of 33 cases, 1(3%) belongs to age group between 26-30 years, 11 (33.3%) between 31-35 years and 21 (63.6%) between 36-40 years.

Out of 33 cases, 25 were females (75.76%) and 8 were males (24.24%). Out of 67 controls, 33 were females (49.25%) and 34 were males (50.75%).

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**DISCUSSION**

Development of pre DM is linked to environmental factors such as physical inactivity but the subsequent development of diabetes is affected by combination of genetic and environmental factors.\(^5\) Adverse environmental factors or disease can cause cells to fail to respond to insulin leading to IR. Once IR develops, the body cells fail to respond to insulin and are unable to use it effectively leading to development of IGT. When the condition develops further, apoptosis of islet cells occurs and glucose metabolism is disrupted leading to clinical DM.\(^6\)

In the present study, we observed that 63.64% of the cases had age group between 35-40 years. Out of 33 cases, 25 were females (75.76%) and 8 were males (24.24%). So, number of cases of preDM increases with age and more in females in comparison to males.

Our study is favoured by DECODA (Diabetes Epidemiology: Collaborative analysis of Diagnostic criteria in Asia) Study done in 11 asian cohorts. In this study it was observed that both FPG and 2 hour plasma glucose concentrations increases with age and attains a peak at age of 60–69 years. The increase is more for 2 hour plasma glucose in comparison to FPG. However, the prevalence of IFG did not increase with age but IGT increases with age specially more in the elderly persons. This study observed that the proportions of undiagnosed diabetes varies with age. It was highest in the youngest age group and the lowest in the elderly persons. The prevalence of diabetes also varies with age. It increased with age up to 60-69 years of age and then declined.

DECODA Study also observed that the prevalence of IFG was higher in women than in men in the Indian population. There was no sex difference in the prevalence of IGT in Indian populations except at 30-39 years of age where women had higher prevalence of IGT than men.\(^1\)

Abtahi *et al* observed that the prevalence of DM was more among individuals between age group of 59-63 years. They also observed age related increases in DM and preDM prevalence rate. It was found that prevalence of IFG and DM were greater in males. However, prevalence of preDM were more among obese women that’s why they are more vulnerable for cardio vascular disease.\(^12\)

**CONCLUSION**

Occurrence of prediabetics cases increases with age and more in female in comparison to males.

**References**

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