ORIGINAL ARTICLE

Prevalence and Incidence of Diabetes Mellitus in rural areas of Sindh Province of Pakistan

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ABSTRACT

Objective: To diagnose the newly cases of diabetes mellitus in our rural, under-developed area.
Design: It was observational study to get data of prevalence about Diabetes Mellitus type I and II.
Background: Diabetes Mellitus describes metabolic disorders of multiple etiologies characterized by chronic hyperglycemia with disturbances of carbohydrates, protein and fat metabolism resulting from defects in insulin secretion, insulin action or both.
Place and duration of study: Study was conducted at free diabetes clinic Muhammad Medical Hospital Mirpurkhas from first October 2004 to 1st Oct 2008.
Patients and methods: Six hundred two Diagnosed Diabetes mellitus patients of both sex male and female divided in two groups. Group one was Diabetes Mellitus type I (30 patients) and group two (572 patients). General physical examination, Blood Pressure, Random Blood Sugar, Fasting Blood Sugar, Haemoglobin$_{A1C}$, and weight was calculated and recorded at the time of initially first visit and during study period. Patients of alcoholism, Peptic ulcer, Renal disease, Hepatic disease, Hypothyroidism, Hyperthyroidism were excluded from the study. Procedure was explained to patients and written consent of patients was taken and approved by ethical committee of MMC. Data were expressed as the % calculated at the end of study and was analysis by paired 't' test. to determine the significance of difference. Probability value of <0.05 was the limit of significance.
Results: Out of 602 selected Diabetes Mellitus Patients 30 patients were suffering from type I and 572 patients were related with type II diabetes mellitus. Difference between these two groups of patients was 90.04±4.04, which is highly significant having P-value <0.001. When gender related data were analyzed it was observed that out of 602 patients only 222 patients were female. Male patients suffering from diabetes mellitus were 380. Difference between groups is 26.24±8.47, which is significant when analyzed statistically, showing P-value <0.01.
Conclusion: Finally we concluded from our study that diabetes mellitus type II patients are rapidly increasing in number as compared to type I diabetes mellitus.
Key words: Diabetes Mellitus (DM), Type 1 or Insulin Dependant Diabetes Mellitus (IDDM), Type 11 or Non Insulin Dependant Diabetes Mellitus (NIDDM).

INTRODUCTION

The term Diabetes Mellitus describes a metabolic disorder of multiple etiologies, characterized by chronic hyperglycemia with disturbances of carbohydrates, fat, and protein metabolism resulting from defects in insulin secretion, insulin action or both. The effects of diabetes mellitus include long term damage, dysfunction and failure of various organs. Diabetes mellitus may present with characteristic symptoms like thirst, polyuria, blurring of vision and weight loss[1]. The number of adults with diabetes world wide is predicted to increase from 135 million in 1995 to 300 million in 2025[2]. In 2000 an estimated 171 million people in the world had diabetes and the numbers are projected to double by 2030[3]. Type 1 diabetes mellitus previously known as insulin dependent or child hood onset diabetes is characterized by a lack of insulin production[4]. In this type of DM Patients always need insulin and are prone to ketoacidosis and weight loss[5]. Type 11 diabetes is a multi-factorial metabolic disease characterized by abnormalities at multiple organ sites. These effects include insulin resistant and insulin defieciency[6]. Type 11 Diabetes can be described as a syndrome characterized by insulin deficiency itself or increased hepatic glucose out put[7]. Indolent, obese and well feed population is two to twenty times more likely to develop type 11 diabetes as lean populations of the same race[8]. The prevalence of type 11 NIDDM in the United States has increased dramatically over the past two decades. NIDDM (non insulin dependant diabetes mellitus) is a common disease that is associated with

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high mortality and morbidity from macrovascular and microvasculer complications. An approximately three fold increased risk exists for all cardiovascular diseases, and life expectance is substantially reduced at all ages of disease presentation. Persons with diabetes presenting in their fourth or fifth decade of life have two fold increased mortality rate as compared with a control population[9].

PATIENTS AND METHODS

This study was observational to see incidence and compare prevalence of type I and II DM. The study was conducted in free diabetic clinic Mohammad Medical College Hospital, Mirpurkhas, Sindh Pakistan from 1st Oct 2004 to 1st Oct 2008.Total numbers of patients who were attended hospital during this study period was 44800. Patients were selected after exclusion criteria, i.e.; alcoholism, peptic ulcer, renal disease, hepatic disease, hypothyroidism, and hyperthyroidism. Six hundred two diagnosed diabetic patients of both sexes male and female were selected and then divided in two groups. General physical examination, Blood Pressure, Random Blood Sugar, Fasting Blood Sugar, HB_{A1C}, weight was estimated/calculated at the time of initially first visit and then one monthly visit, during the study period. Both types of diabetic patients were treated according to their blood glucose levels with the anti diabetic drugs. Consent Performa was shown to and got approval from 'Research Ethical Committee' of Mohammad Medical College, Mirpurkhas. Procedure was explained to the patients before written consent. Data were recorded on designed Performa for further analysis. There were two groups of patients, so paired 't' test was applied for statistical analysis. Data were compared in percentage and then its P-value was determined. Limit of significance was P-value <0.05

RESULTS

Out of 602 selected diabetes mellitus patients, it was observed that only 30 patients were suffering from type I diabetes mellitus. Five hundred and seventy two patients were observed to have type II diabetes mellitus, as shown in table 1. When number of patients were expressed in percentage, it was 4.98% of type I and 95.02% of type II diabetic patients. Difference between these two groups is 90.04±4.04. When paired 't' test was applied to analyze the significance of difference between two groups, P-value was <0.001, which is highly significant statistically.

According to gender, male and female patients were divided separately in two groups. We observed that out of six hundred and two patients, three hundred eighty patients gender was male. It was 63(12%). Only two hundred and twenty two female patients were suffering from diabetes mellitus. In percentage they were 36.88%. Difference between two groups is 26.24±8.47. When difference was analyzed statistically by paired 't' test, it was significant, i.e.; P-value <0.01, as shown in table 2.

Table: 1: Comparison of diabetic patients in type 1 and type 11 diabetes, showing % and P-value at the end of study

Types of Diabetes	n=	%age	Difference between groups
Type1 DM	30	04.98	
Type 11 DM	572	95.02	90.04 ± 4.04

P value: <0.001 Significant
± indicates standard error of mean

Table: 2: Comparison of Diabetic patients in two genders, showing % and P-value at the end of study

Gender of Diabetic patients	=n	%age	Difference between groups
Male patients	380	63.12	26.24 ± 8.47
Female patients	222	36.88	

P value: <0.01 Significant
± indicates standard error of mean

DISSCUSSION

Objective of our four years study was to identify prevalence and incidence of type II diabetes mellitus in rural area of Sindh province of Pakistan. Results of our research and observations coincide with the results of four years study conducted by John L M. et al[10]. Their study was also long term i.e., four years study. They also observed the same results. Epidemiology and complications of diabetes mellitus were same as in our study. Krische Daniel[11] explained prevalence and incidence of type II diabetes mellitus. He observed that type II deibetes mellitus is increasing. Cause may be insulin resistance to normal circulating levels of the hormone. This resistance to insulin may start in early age and lead to other complications like hypertension, dyslipidemia and obesity. Hyperlipidemia, obesity and hypertension in early age, itself may be etiologies or risks for hyperglycemia. Our study observations matches with the observations of Matthew RC[12] who observed same incidence of DM type II in 1100 male and female patients, age range from 30 to 70 years. They selected obese, hyperlipidemic, hypertensive, chain smokers and indolent individuals in their study. They then explained about sedentary life style, less physical exercise, junk food intake and cigarette smoking are potent and sure shot predisposing factors for development of diabetes mellitus type II in western society. Another study conducted by Marwat MA and Wazir ZM[13] also discussed that the increasing obesity and decrease in physical activity in

westernized societies are strongly linked with the increased prevalence and incidence of type 11 diabetes. Dabelea D et al[14] stated that with longer treatment using only diet and exercise, glycemic-control progressively worsened. Pharmacotherapy is initiated when dietry measures and exercise prove ineffective. The Canadian Diabetes association recently recommended the combination therapy as a first line approach to treat type 11 diabetes. Although current American diabetes association guidelines suggest a step wise approach. They recommended that a target of A1C <6.0% be considered controlled hyperglycemia, depending on the risk of hypoglycemia. Additionally, the potential benefit of agents that reduce post prandial glucose is noted.[15] Our study results are in contrast with results of study conducted by Tamborlan WR et al[16] who observed incidence of type II diabetes mellitus patients 70% in the city of manjik in United Kingdom. All patients were female in their study. This difference may due to large sample size (2560 patients), well controlled environment (patients were stayed in the diabetic centre) at research centre and the only female gender in their study. They explained that type 1 diabetes is considered an autoimmune disorder that involves (1) Beta cells in the pancreas that produce insulin are gradually destroyed. Eventually insulin deficiency is absolute. (2) Without insulin to move glucose into cells, blood glucose levels become excessively high, a condition known as hyperglycemia. (3) Because the body cannot utilize the sugar, it spills over into the urine and is lost. (4) Weakness, weight loss, frequent urination, and excessive hunger and thirst are among the initial symptoms. (5) Patients with type 1 diabetes need to take daily insulin for survival. Our results do not match with results of study conducted by Retnakaran R, and Zinman B[17] who observed prevalence and incidence of type I diabetes in 2008 male patients. Out of 2008, only 56% were suffering from diabetes mellitus type II. 43.42% were detected suffering from type I diabetes mellitus. This remarkable difference may be due to genetic variation as all patients were from Africa continent. Another reason for that difference may be due to age factor as in their study inclusion criteria for age was 17-30 years.

CONCLUSION

Finally we concluded from our study that type II diabetes mellitus patients were rapidly increasing in rural population of province of Sindh, Pakistan as compared to type I diabetes mellitus patients in the given study period.

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