Original Article

PSYCHOSOCIAL DETERMINANTS OF TYPE 2 DIABETES MELLITUS

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ABSTRACT:

Diabetes Mellitus type 2 , formerly non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes, is a metabolic disorder that is characterized by high blood glucose in the context of insulin resistance and relative insulin deficiency[1]. The development of Diabetes Mellitus type 2 is associated with multiple risk factors, co-morbid medical conditions as well as psychosocial determinants. These psychosocial factors, which differ from population to population, can be identified and controlled to reduce the incidence of type 2 Diabetes Mellitus.

Objective: To identify various psychosocial factors associated with type 2 Diabetes Mellitus.

Design: Case-control study.

Place & Duration: Diabetic clinic and Medical Units Mayo Hospital Lahore . July to December, 2012.

Subjects & Methods: A population based case-control study with 1:1 case to control ratio was conducted. A total of 100 subjects (50 cases and 50 controls) having age above 35 years were recruited in the study. Selection was made on laid down criteria from patients coming to Mayo Hospital Lahore after taking consent. Interviews were conducted through a pretested questionnaire. Data was collected, compiled and analyzed through IBM SPSS version 20.

Results: Out of 100 study subjects 67% were males and 33% were females. Among cases of Diabetes mellitus type 2, 64% were males, 70% in the age group 35-50 years, 96% were married, 36% were illiterates. Mean age was found 49.24, standard deviation 10.915. In bivariate analysis, Diabetes Mellitus type II was found significantly associated with Anxiety(OR: 5.348, 95% CI: 2.151-13.298) Depression(OR: 5.063, 95% CI: 1.703-15.050), High fat diet, (OR: 2.471, 95% CI: 1.100-5.547) Sedentary Lifestyle(OR: 4.529, 95% CI: 1.952-10.508) and Psychological Stress(OR:

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4.529, 95% CI: 1.952-10.508).However, in multivariate analysis while controlling all other risk factors, Anxiety(OR: 6.066, 95% CI: 1.918-19.191), High fat diet(OR: 3.648, 95% CI: 1.265-10.522), Overeating(OR: 3.196, 95% CI: 1.127-9.064) and Psychological Stress(OR: 3.071, 95% CI: 1.151-8.188) were found significant.

Conclusion: The type 2 Diabetes Mellitus was significantly associated with Anxiety, High fat diet intake, Overeating and Psychological stress.

Keywords: Psychosocial, determinants, type 2 Diabetes Mellitus, anxiety, psychological stress, high fat diet, overeating.

Introduction

This research is aimed to find out psychosocial determinants of Diabetes Mellitus type II in Adult patients in a public sector hospital. Diabetes mellitus II, is a metabolic disorder that is characterized by high blood glucose in the context of insulin resistance and relative insulin deficiency.[1] In 2010 it was estimated that there were 285 million people with type 2 diabetes making up about 90% of diabetes cases.[2]Pakistan has seventh highest number of diabetics in the world.[3]

The review of literature showed that psychological stress[4,5] is a predisposing factor in development of type-2 diabetes. Advancing Age [6], Obesity [7, 8], Sedentary Lifestyle[9] and hereditary factors[10, 11] were studied in Diabetes and found to play some role. Other researches showed anxiety[12, 13] and depression[14] were major contributors. Smoking[15-20] enhances the risk and it has been established that secondhand smoke[21] was also a cause. Excessive overtime, probably due to over commitment to work had been reported to be associated with 4-fold higher risk of type-2 diabetes[22].Distressed Sleep [23] and Hostility [24]were described as risk factors of Diabetes Mellitus. It had been found that persons who had experienced significant hard life events during the past five years had a 1.6-fold increased risk to have type 2 diabetes compared to those who had not experienced hard life events[25]. Chronic Alcoholism[26] was also a contributory factor along with Lack of Exercise[27], Low Birth Weight[28, 29] and Premature Birth[30].

The burden of Diabetes mellitus II had increased in the past decade and was contributed by the change in life style in developing countries. The rise in Diabetes Mellitus had caused chronic complications leading to increased morbidity and mortality[31-36]. The Diabetes pandemic had increased burden on health resources, health care providers and health system. The prevention strategies, life style modifications and awareness campaigns about the determinants of Diabetes Mellitus type II could improve the public health in the country in general and in the high risk groups in particular.

Subjects & Methods

A case-control study was conducted to identify various psychosocial factors associated with Diabetes Mellitus Type II in patients visiting Mayo Hospital Lahore. Study population was divided into two groups. The study included adult subjects, both male and female having age above 35 years. The study population was placed in two groups .Group 1 comprised of diagnosed cases of type 2 Diabetes Mellitus in Diabetic Clinic and Medical Units in Mayo Hospital according to the standard guidelines about blood sugar levels. The patients who were on oral treatment for Diabetes Mellitus were also included. The patients who were using insulin or having complications of Diabetes Mellitus or refused to give consent were excluded from the study. Group 2 consisted of 50 individuals who were healthy controls and their blood sugar levels were normal. The convenient sampling technique was used to recruit study controls as well as cases. Consent was obtained from all selected study subjects. All information about the study subjects was kept confidential. Data were collected by interviews using pretested and closed ended questionnaire, keeping all ethical and social considerations in mind. Socio-demographic factors included in the questionnaire were name, age, gender, marital Status, educational qualification, occupation, family income, contact information and address. The dependent variable was Diabetes Mellitus type II and independent variables were anxiety, alcoholism, depression, disrupted sleep, high fat diet, junk food intake, lack of exercise, overweight and obesity, low birth weight, premature birth, over eating, sedentary life style, active smoking, passive smoking, psychological stress, and type A personality. Data entry and analysis was done by statistical software IBM SPSS version 20. After describing the demographic characteristics using frequency tables and percentages. The bivariate analysis and chi square test was used to find statistical significant association of the variables. The confounders were controlled and binary

logistic regression was used to calculate odds ratio and their 95% confidence intervals to show statistical significant association between dependent and independent variables.

Results

Out of 100 study subjects 67% were males and 33% were females. Among cases males were 64 %. The most of the cases were aged 35-50 years (70%) and illiterates (36 %). In the control group majority belonged to males (70 %), between the age of 35-50 years (52 %) and literate (24 %). Thus both case and control groups were matched for age and gender. In the study subjects mean age was found 49.24, standard deviation 10.915 and variance 119.314. See figure 1.

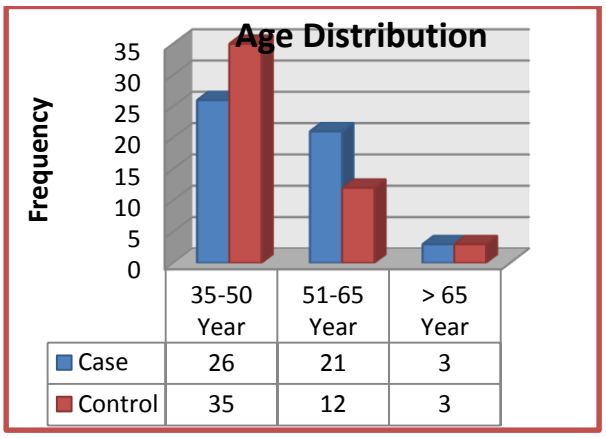

Figure No.1: Age Distribution

In bivariate analysis, Diabetes Mellitus typeII was found significantly associated with Anxiety(OR: 5.348, 95% CI: 2.151-13.298) Depression(OR: 5.063, 95% CI: 1.703-15.050), High fat diet, (OR: 2.471, 95% CI: 1.100-5.547) Sedentary Lifestyle(OR: 4.529, 95% CI: 1.952-10.508) and Psychological Stress(OR: 4.529, 95% CI: 1.952-10.508).Whereas, Alcoholism, Disrupted sleep, Junk food intake, Lack of regular exercise, Overweight and Obesity, Premature birth and low birth weight, active and passive Smoking and Type-A personality were not found significant statistically. See Table 1.

Table 1: Bivariate Analysis

No.	Psycho-social Factor	Diabetes Mellitus Type-2		Bivariate Analysis			Chi- Square Value
		Case n=50	Control n=50	Crude Odds Ratio	95 % CI		
					Lower	Upper	
1	Alcoholism	3	2	1.532	0.245	9.587	0.211
2	Anxiety	27	9	5.348	2.151	13.298	14.063
3	Depression	18	15	5.063	1.703	15.050	9.543
4	Disrupted Sleep	16	10	1.882	0.756	4.690	1.871
5	High Fat Diet	28	17	2.471	1.100	5.547	4.889
6	Junk Food Intake	15	19	0.699	0.304	1.607	0.713
7	Lack of Exercise	40	33	2.061	0.832	5.104	2.486
8	Overweight and Obesity	20	14	1.714	0.742	3.961	1.604
9	Premature Birth and Low Birth Weight	3	1	0.495	0.406	1.604	1.010
10	Overeating	22	13	2.236	0.962	5.197	3.560
11	Sedentary Lifestyle	35	17	4.529	1.952	10.508	12.981
12	Active Smoking	10	12	0.792	0.306	2.046	0.233
13	Passive Smoking	14	21	0.537	0.233	1.237	2.154
14	Psychological Stress	35	17	4.529	1.952	10.508	12.981
15	Type-A personality	24	22	1.175	0.535	2.581	0.161

Multivariate logistic regression model was used to control for possible confounding effect. It was observed that there were some changes between the crude odds ratios and the adjusted odds ratios. It was observed that after controlling for all the factors studied the strongest statistically significant association was exhibited by Anxiety (OR: 6.066, 95% CI: 1.918-19.191), High fat diet (OR: 3.648, 95% CI: 1.265-10.522), Overeating (OR: 3.196, 95% CI: 1.127-9.064) and Psychological Stress (OR: 3.071, 95% CI: 1.151-8.188). See Table 2.

Table 2: Multivariate Analysis

No.	Psycho-social Factor	Diabetes Mellitus Type-2		Multivariate Analysis			Chi- Square Value
		Case n=50	Control n=50	Adjusted Odds Ratio	95 % CI		
					Lower	Upper	
1	Anxiety	27	9	6.066	1.918	19.191	14.063
2	Depression	18	5	3.049	0.863	10.775	9.543
3	High Fat Diet	28	17	3.648	1.265	10.522	4.889
4	Overeating	22	13	3.196	1.127	9.064	3.560
5	Psychological Stress	35	17	3.071	1.151	8.188	12.981

Discussion

The psychosocial determinants associated with development of type 2 Diabetes mellitus may vary from population to population. Factors found significantly associated in the study were anxiety, high fat diet, overeating and Psychological stress.

Engum (2007) had tested anxiety as a risk factor for the development of diabetes, using data from a large Norwegian prospective population-based study (n=37,291). Both baseline anxiety and depression were associated with an increased risk for the development of type 2 diabetes at 10 years follow-up (OR: 1.5, 95% CI: 1.3-1.8)[13].Anxiety was found a significant predisposing determinant in the study.

Mezuk et al. (2008) were able to include a total of 13 studies that investigated depression as a risk factor for diabetes, representing 6,916 incident cases.[12] In that meta-analytic review, the risk for incident diabetes was 60% higher in depressed participants, compared to non-depressed controls (OR: 1.60, 95% CI: 1.37-1.88).Whereas results for Depression in our study were not in accordance with previous studies. Several prospective studies have tested the hypothesis that general emotional stress was associated with an increased risk for the development of type 2 diabetes (Rod et al., 2009) (OR: 2.4; 95% CI: 1.2-4.6)[5]. In a Japanese community-based cohort study, the associations between perceived mental stress and the onset of diabetes were investigated (Kato et al., 2009) (OR: 1.36, 95% CI: 1.13-1.63) among men and (OR: 1.22, 95% CI: 0.98-1.51) among women[4].

In the study Psychological stress was found statistically significant. Jamey D. Marth, Ph.D., director of the Center for Nanomedicine, University of California, has revealed a pathway that links high-fat diets to a sequence of molecular events responsible for the onset and severity of diabetes[37]. Available researches showed that other determinants associated with development of the disease were Obesity, Sedentary Lifestyle, Active and Passive Smoking, Disrupted sleep, Junk food intake, Lack of regular exercise, premature birth, low birth weight and type-A personality[17-37]

Thus awareness of the risk factors of the deadly disease should be created and life style modifications should include the changed behavior in public about prevention of risk factors of Diabetes Mellitus.

Conclusion

Anxiety, psychological stress, high fat diet and Overeating were found to be psychosocial factors associated with Diabetes Mellitus Type II.

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