ORIGINAL ARTICLE

FAMILY HISTORY OF DIABETES AND AWARENESS OF RISK FACTORS IN TYPE 2 DIABETIC PATIENTS

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ABSTRACT

Background: Diabetes mellitus is a preventable disease among the non-communicable diseases. Primary prevention strategies can be formulated based on the risk factors. Family history information may serve as a useful tool for public health because it reflects both genetic and environmental factors. The aim of this study was to determine the family history and level of awareness of risk factors in type 2 diabetic patients.

Material & Methods: This cross-sectional study was conducted in three tertiary care hospitals of Peshawar from February 2009 to July 2009. A structured questionnaire was used, 400 type 2 diabetic patients, age 40 to 60 years, were assessed for family history and their knowledge regarding the awareness of risk factors. The data was analyzed using SPSS version 16.

Results: In 193(48.3%) patients there was positive family history of diabetes. Considering only the parental history i.e., patients with diabetic father, mother, and parents, the prevalence was 24.9%, 26.9 %, and 36.3%, respectively. Patients who had siblings with diabetes were 10.4%. Further, the prevalence of diabetes was more among patients with both parents being diabetic (36.3%). Patients with family history of diabetes were more aware of the risk factors for diabetes.

Conclusion: The tendency of getting diabetes is greater with strong family history. Patients with history of diabetes in family are more aware of the risk factors.

KEY WORDS: Type 2 diabetes mellitus, Family history, Risk factor.

INTRODUCTION

Family history represents the integration of risk within a family from shared genetic susceptibilities and familial clustering of environmental exposures, life style, and behaviors. Epidemiological evidence shows associations between the family history and risk for many common chronic diseases.[1] Diabetes has become a major public problem in Pakistan. According to the International Diabetes Federation (IDF), Pakistan had 6.2 million people with diabetes in 2003. By 2025 the number of people affected by diabetes is expected to rise to well over 14.5 million. Six million people are currently suffering from impaired glucose tolerance, and will eventually contract diabetes. Pakistan has the seventh largest population of diabetes in the world, and will take fourth place by the year 2025. Deaths from diabetes alone are projected to increase by 51% over the next 10 years.[2] Diabetes is a major health hazard, associated with acute and long term complications. Diabetic patients are 25 times more likely to develop blindness, 17 times more likely to develop kidney disease, 2 to 4 times more likely to develop myocardial infarction, and twice more likely to suffer from stroke than individuals without diabetes.[3] Diabetes is fortunately one of the most preventable diseases among the non-communicable diseases. Primary prevention strategies can be formulated based on the risk factors.[4]

Family history information may serve as a useful tool for public health because it reflects both genetic and environmental factors.[5] It can provide a useful tool for the screening and possible prevention of disease.[6]

The aim of this study was to determine the family history and level of awareness of risk factors in type 2 diabetic patients.

MATERIAL AND METHODS

This study was conducted in Physiology Department of Khyber Medical College Peshawar. Four hundred type 2 diabetic patients were selected from the three tertiary care hospitals of Peshawar i.e. Khyber Teaching Hospital, Lady Reading Hospital and Hayatabad Medical Complex. The age group selected was 40 to 60 years, irrespective of sex. Diagnosis of diabetes was based on the American Diabetes Association criteria.[7] Patients with impaired glucose tolerance test or known diabetics taking oral hypoglycemic drugs, or managed with diet for the control of diabetes, were included in the study. Patients using insulin were excluded from the study.

A structured questionnaire was used and 400 participants were assessed on their knowledge regarding the family history and awareness of risk factors about type 2 diabetes mellitus.

The variables of questionnaire were age, the age at diagnosis of diabetes, sex, personal history (occupation, education) eating pattern, and nutritional status, exercise history, smoking status, and gestational diabetes. Participants of the study were divided into four groups according to the family history of diabetes. In the first, second, third and fourth group, patients with diabetic mother, father, parents and relatives other than parents were included. The independent variables in the study were age, gender, family history of diabetes mellitus and regular visit to health care provider. The dependent variable was awareness level about diabetes and risk factors. Each diabetic patient was examined and asked whether any of his /her family members had diabetes.

The risk factors awareness was compared between patients with known family history of diabetes and with no family history.

Exercise history or physical activity was scored as regular, irregular and nil based on the level of activity performed. An activity scored as regular was given to individual who briskly walked or jogged or performed aerobic exercises regularly for 25 to 30 minute a day for 5-7days a week. Those performing occupational activities, including walking to work, household jobs, or regular light exercise were scored is irregular and less active individuals with sedentary life style were given a score of nil.[8]

Considering the nutritional status in the study participants, the intake of 1200-1600 Kcal/day was considered as the standard.[9] Body Mass Index (BMI) was calculated for each study subject using the formula: BMI=weight (in Kg)/height (in meter) squared. The BMI cut of values for Asians were followed out[10] as the patients with normal body mass index were having 18.5-22.9 Kg/m^2.The patients were categorized as overweight with body mass index 23-24.9Kg/m^2.The patients were considered obese with body mass index >25Kg/m^2. Sample size was calculated using EPI-info.

The information collected in the questionnaires was transferred to the SPSS version 16.0 statistical software. For categorical variables (such as gender and awareness level) frequency (percentage) were reported. . The level of statistical significance was taken as $p<0.05$.

The study protocol was approved by ethical committee of Pakistan Medical Research Council and the local Khyber Medical College ethical committee.

Table 1: Risk factors related to patients with family history of type 2 diabetes mellitus (n=193).

	Diabetic Father	Diabetic Mother	Diabetic Parents	Diabetic Siblings
Number*	48 (24.9%)	52(27.0%)	70(36.37%)	22(11.40%)
Gender				
Female	23(11.9%)	40(20.7%)	42(21.8%)	10(5.2%)
Male	25(13.0%)	12(6.2%)	28(14.5%)	12(6.2%)
Age at diagnosis of diabetes mellitus				
40-45 years	12(6.2%)	22(11.4%)	35(18.1%)	06(3.1%)
46-50 years	15(7.8%)	10(5.2%)	12(6.2%)	08(4.2%)
51-55 years	13(6.7%)	12(6.2%)	10(5.9%)	05(2.5%)
56-60 years	14(7.3%)	08(4.1%)	13(6.7%)	03(1.6%)
Body Mass Index				
Normal weight	10(5.2%)	10(5.2%)	12(6.2%)	04(2.1%)
Over weight	20(10.4%)	30(15.5%)	40(20.7%)	10(5.2%)
Obese	18(9.3%)	12(6.2%)	18(9.3%)	08(4.1%)

Table 2: Demographic profile of study participants.

Variable	Patients with family History of diabetes (N=193) (48.25%)	Patients with no family History of diabetes (N=207) (51.8%)	p-value
Gender			
Females	100 (51.8%)	105 (50.7%)	
Male	93 (48.2%)	102 (49.3%)	
Known diabetic for			
< 5 Yrs	80 (41.5%)	100 (43.3%)	
5-8 Yrs	113 (58.5%)	107 (51.7%)	
Nutritional Status			
Vegetarian	98 (50.8%)	96 (35.5%)	
Non-Vegetarian	95 (49.2%)	111 (53.6%)	
Calories Intake			
1200-1600 Kcal/day	70 (36.3%)	25 (12.1%)	
> 1200-1600 Kcal/day	123 (63.7%)	182 (87.9%)	0.005
Weight History			
Normal BMI	35 (18.1%)	10 (4.8%)	
Over Weight	95 (49.2%)	81 (39.1%)	0.006
Obese	63 (32.6%)	116 (56.0%)	0.005
Treatment of with Medications			
Yes	180 (93.3%)	108 (52.2%)	0.005
No	13 (6.7%)	99 (47.8%)	
Meal Planning			
Yes	120 (62.2%)	150 (72.5%)	0.036
No	73 (37.8%)	57 (27.5%)	
Result of Glucose Monitoring			
Good	68 (35.2%)	28 (13.5%)	
Fair	93 (48.2%)	107 (51.7%)	0.005
Poor	32 (16.6%)	72 (34.8%)	0.005
Exercise History			
Regular	60 (31.1%)	10 (4.8%)	
Irregular	98 (50.8%)	127 (61.2%)	0.005
Nil	35 (18.1%)	70 (38.8%)	0.005
Time between monitoring of Glucose Levels			
Within One Week	110 (56.9%)	120 (57.9%)	
Within One Month	70(36.3%)	60 (58.9%)	0.323
More than One Month	13 (6.7%)	27 (13.0%)	0.104
Current Infection			
Yes	23 (11.9%)	39 (18.8%)	
No	170 (88.1%)	168 (81.2%)	
Use of Tobacco and Addictive substances			
Yes	8 (4.1%)	25 (12.0%)	0.006
No	185 (95.8%)	182 (87.9%)	
Gestational Diabetes in Case of Females			
Yes	6 (3.1%)	6 (2.9%)	0.864
No.	187 (96.9%)	201 (97.1%)	

RESULTS

Diabetic patients screened for family history of diabetes showed that 193(48.3%) had a positive family history of diabetes mellitus. The prevalence of diabetes in the mother, father and other relatives was 52 (26.9%), 48 (24.9%) and 20 (10.4%) respectively. Only 70 (36.3%) patients had both parents with known diabetes.

Patients having a family history of diabetes were initially significantly associated with greater awareness of the risk of being overweight, having family members with diabetes, not exercising enough, and consuming an energy rich diet. Our results show that established risk for gestational diabetes mellitus are relevant in women with family history of diabetes but not be the principal determinants of gestational hyperglycemia in women without family history of diabetes. Taken together, these data support a model where in gestational diabetes mellitus, like type 2 diabetes, and result in pathological interaction between genetic susceptibility and acquired environmental factors.

Moreover the patients with positive family history are more aware of the risk factors, which were in contact regularly with health care providers due to an affected family member, rather than the national education system.

DISCUSSION

Asians have strong familial aggregation of diabetes with high prevalence among the first degree relatives and vertical transmission through two or more generations.[11] Recent National Institutes of Health state-of-the-science statements on family history recognized the important role of family history in the practice of medicine, motivation of positive lifestyle changes, and influence of clinical interventions.[12] In the present study the prevalence of diabetes in patients with parents being diabetic was higher. The Framingham offspring study found that the risk of type 2 diabetes among offspring with a single parent with diabetes was 3.5 fold greater without parental diabetes.[13] Studies have estimated that risk for diagnosed type 2 diabetes increases approximately two-to four when one or both parents are affected.[14] In the present study, the prevalence of diabetes was higher when both the parents were affected; taking the comparison of single parents the prevalence of diabetes in mothers was again higher than in fathers of type 2 diabetic patients. The excess maternal transmission of type 2 diabetes reported in the present study is in line with studies from different populations.[15,16] Also, an excess maternal transmission has been observed in Pima Indians, which are characterized by the highest prevalence of diabetes.[17]

The comparison between patients with positive family history of diabetes, with patients without diabetic relatives revealed differences in age at diabetes diagnosis. Patients with a diabetic parent were younger at the age of diabetes diagnosis than patients without diabetic relatives. The above finding has been confirmed by previous reports,[18] suggesting that the age at diabetes onset might be genetically determined. Our analysis showed that women were more likely than men to report having a family history of diabetes. This result was similar to that of Annis et al[19] who found that more women than men reported having first degree relatives with diabetes and those women were more likely to report on female then on male relatives with diabetes.

Our finding are not in accordance with the results of a United Kingdom study showing that first degree relatives of people with type 2 diabetes consume diets higher in fat and cholesterol, increasing their risk of developing diabetes.[20] We found that individuals with family history of diabetes were more likely than those without a family history to be vegetarian, took regular medications (93.2%) and plan their meals (62.1%).

The patients with family history of diabetes monitor their glucose levels, and exercise more as compared to patients with no family history of diabetes (93.1%). Our results support the finding of Forsyth and Goetsch in their study showing that individuals with family history of diabetes engaged in health protective behaviors, specifically weight control behaviors, more often than individuals without a family history of diabetes.[21]

CONCLUSION

The tendency of getting diabetes is greater with strong family history. Patients with history of diabetes in family members are more aware of diabetes risk and likely to engage in certain preventing health behaviors compared to those with no history of diabetes in the family members.

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