ORIGINAL ARTICLE

Frequency and Association of Family History of Type 2 Diabetes in Type 2 Diabetic Patients

UZMA ZAFAR, HAMID JAVAID QURESHI*, QAMAR SHAKOOR SANDHU** *ZAIMA ALI*

ABSTRACT

Aims: To determine the frequency and association of family history of type 2 diabetes mellitus (T2DM) in type 2 diabetics.

Methodology: It was a descriptive cross-sectional study. Study population included one hundred and seventy five male subjects, between the ages of 35 to 60 years. They were divided into two groups. Group A (Patients); included one hundred type 2 diabetics. Group B (Controls); included seventy five non diabetics. Type 2 diabetics were selected randomly from Diabetic Center of Services Institute of Medical Sciences, Lahore. Non diabetic subjects were selected on the basis of history and fasting glucose samples on two occasions. After informed consent history was taken. Physical examination was done and questionnaire was filled. Data was analyzed using SPSS version 17.

Results: Out of 100 type 2 diabetic patients, 72 (72%) patients were having family history of T2DM and 28 (28%) patients denied family history of T2DM. Out of 75 non diabetic subjects 20 (26%) were having family history of diabetes and 55 (74%) denied family history of type 2 diabetes. There was significant association (*p = 0.007*) of family history of T2DM with frequency of T2DM.

Conclusion: Family history of T2DM is an independent risk factor for the disease to occur.

Keywords: Family history. Type 2 diabetes mellitus. frequency.

INTRODUCTION

Diabetes mellitus is a metabolic disorder, characterized by hyperglycemia either due to deficiency of insulin or resistance of target organs of the body to insulin[1]. In 2000, according to WHO 171 million people worldwide suffered from diabetes and it is estimated that by 2030, the number of diabetics will exceed to 366 million. Pakistan will have an increase from 5.3 million cases in 2000 to 13.9 million cases in 2030[2,3]. The vast majority of cases of diabetes fall into two broad categories. In the category, type 1 diabetes mellitus (T1DM) the cause is an absolute deficiency of insulin secretion. The other much more prevalent category, type 2 diabetes mellitus (T2DM), the cause is combination of resistance of target organs of the body to insulin action and an inadequate compensatory insulin secretion. Ninety percent of all the cases of diabetes fall in the second category. Previously, it was considered as disorder of aging but now its incidence is increasing among children due to obesity[1,4-6]. The pathogenesis of T2DM involves the interaction of genetic and environmental factors. Insulin resistance is a consistent finding in patients with T2DM and resistance is present several years before the onset of T2DM. First degree relatives of type 2 diabetics have insulin resistance even at a time when they are normal glucose tolerant and non obese implying a strong genetic component in development of T2DM. Other scientific evidences have also shown the graded and independent contribution of a positive family history to the increasing risk for diabetes in the U.S. population[7-10]. The aim of this study was to determine the frequency and association of family history of type 2 diabetes mellitus (T2DM) in type 2 diabetics.

*Department of Physiology, Lahore Medical and Dental College, *Department of Physiology, Akhter Saeed Medical College Lahore, **Department of Physiology, Lahore Medical and Dental College*
Correspondence to Dr. Uzma Zafar, Assistant Professor
Email: uzma.zargham@gmail.com

MATERIALS AND METHODS

It was a descriptive cross-sectional study. Study population included one hundred and seventy five male subjects, between the ages of 35 to 60 years. They were divided into two groups. Group A (Patients); included one hundred type 2 diabetics. Group B (Controls); included seventy five non diabetics. Type 2 diabetics were selected randomly from Diabetic Center of Services Institute of Medical Sciences, Lahore. Non diabetic subjects were selected on the basis of history and fasting glucose

sample on two occasions (After an overnight fast of 8-hours, fasting venous sample was drawn. Sample was secured and Glucose was checked by Enzyme-Oxidase method[11]. If fasting blood sugar was more than 100mg/dl the subjects were not included in the study[1]). Written informed consent was taken from the subjects. Complete demographic information and history were taken. Questionnaire was filled.

Statistical analysis: The data was entered and analyzed using SPSS version 17.0. Percentages and frequencies were given for qualitative variables. Chi square test was applied to see the association of family history of T2DM with frequency of T2DM. A *p* - value of <0.05 was considered as statistically significant.

RESULTS

Out of 100 type 2 diabetic patients, 72(72%) patients were having family history of T2DM and 28(28%) patients denied family history of T2DM. Out of 72 patients 49 (68%) patients had history of T2DM in mothers, 19(26.4%) patients had family history in father and in 4(5.5%) patients both parents were suffering from T2DM. Out of 75 non diabetic subjects 20(26%) were having family history of diabetes and 55(74%) denied family history of type 2 diabetes. There was significant association (*p=0.007*) of family history of T2DM with frequency of T2DM.

Association of family history of T2DM with frequency of T2DM

Family H/O T2DM	Diabetics	Non diabetics
Yes	72	20
No	28	55
Total	100	75

X^2 =7.28, *p*=0.007, *d* =1

DISCUSSION

This study has shown association of family history of T2DM with frequency of T2DM. The association between family history of diabetes and risk for the disease has been well documented in various other scientific evidences[12-15]. Insulin resistance is present even in young normoglycemic and lean first degree relative of type 2 diabetic as compared to that of the non diabetic[16]. According to a report of the National Health and Nutrition Examination Survey by Valdez, et al. (2007) family history of diabetes has a significant, independent, and graded association with the prevalence of diabetes[17]. The risk of diabetes according to family history was stratified at three levels. High: At least two first-degree relatives or one first degree and at least two second-degree relatives with diabetes from the same lineage. Moderate: Just one first degree relative and one second degree relative with diabetes, or at least two second-degree relatives with diabetes from the same maternal and paternal line. Average: No family history of diabetes or at most, one second-degree relative with diabetes. Although in this study the definition of family history of diabetes is not comparable with the above, but results of the present study also indicate importance of genetic predisposition for the development of type 2 diabetes mellitus.

CONCLUSION

Family history of T2DM should be incorporated as a predictive tool in diagnostic and prevention programs of T2DM.

Acknowledgements: We acknowledge and appreciate Dr. Aziz Fatima and Dr. Khushroo Minhas of Diabetic Management center, Services Hospital, Lahore for their help and support during this research work.

REFERENCES

1. American Diabetes Association. Diagnosis and classification of diabetes mellitus. Diabetes Care 2008; 31:55-60.
2. Wild S, Bchir MB, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes. Diabetes Care 2004; 27:47-53.
3. Shera AS, Jawad F, Maqsood A. Prevalence of diabetes in Pakistan. Diabetes Res Clin Pract 2007; 76:219-22.
4. Guillaussau PJ, Meas T, Virally M, Laloi-Michelin M, Medeau V, Kevorkian JP. Abnormalities in insulin secretion in type 2 diabetes mellitus. Diabetes Metab 2008; 34:S43-S8
5. Buse JB, polonsky KS, Burant CF. Type 2 Diabetes Mellitus. In: Laren PR, Kronenberg HM, Melmed S, Polonsky KS. Williams Text Book of Endocrinology. Philadelphia: Saunders; 2003:1427-42.
6. Defronzo RA, Mandarino L J. Insulin actions. In: Henry HL, Norman AW. Encyclopedia of Hormones (vol 2). San Deigo, Academic Press; 2003: 333-46.
7. Kaiser N, Leibowitz G, Nesher R. Glucotoxicity and beta-cell failure in type 2 diabetes mellitus. J Peditar Endocrinol Metab 2003;16:5-22
8. Brunner Y, Schvartz D, Priego-Capotae F, Coute Y, Sanchez JC. Glucotoxicity and pancreatic proteomics. Journal of Proteomics 2009; 576-91
9. Lorenzo C, Wegenknecht LE, D'agostino RB, Rewers MJ, Karter AJ, Hafner SM. Insulin resistance, β-cell dysfunction, and conversion to type 2 diabetes in a multiethnic population. Diabetes Care 2010; 33:67-72.
10. Shahid A, Lone KP, Saeed S, Arslan M. Male offspring of both diabetic parents have higher insulin resistance and serum leptin levels compared to those with one diabetic parent. Hormones 2008;7:313-9

11. Barham D, Trinder P. An improved colour reagent for the determination of blood glucose by the oxidase system. Analyst 1972; 40:142-5.
12. Hashimoto N, Suzuki Y, Haruki AT, Sakuma Y, Iwai R, Takahashi H. The association between the ferritin concentration and the serum insulin resistance markers, and follow up analysis for three years in non diabetic Japanese men. Diabetes Care 2008; 31: 55-60
13. Valdez R, Greenland KU, Khoury MJ, Yoon PW. Is family history a tool for detecting children at risk for diabetes and cardiovascular diseases. A public health perspective. Pediatrics 2007;120:78-86
14. Arslan SA, Saad R, Bacha F, Gungor N. Family history of type 2 diabetes is associated with decreased insulin sensitivity and an impaired balance between insulin sensitivity and insulin secretion in white youth. Diabetes Care 2005;28(1):127-31
15. Strackowski M, Kowalska I, Stepien A, Dziens-Straczkowska S, Szelachowska M, Kinalska I, Krukowska A, Konicka M. Insulin resistance in the first-degree relatives of person with type 2 diabetes. Med Sci Monit 2003;9(5):238-42
16. Kumar A, Tewari P, Sahoo SS. Prevalence of insulin resistance in first degree relatives of type-2 diabetes mellitus patients: A prospective study in North Indian population. Ind J Clinical Biochem 2005; 20:10-7.
17. Valdez R, Liu T, Yoon PW, Khoury MJ. Family history and prevalence of diabetes in the U.S. population. Diabetes Care 2007; 30:2517-22.