Original Article

Transgenerational Preventive Practices of Diabetes Mellitus Type II Patients Attending a Tertiary Care Hospital in Cochin, India

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Abstract

Introduction: The incidence and prevalence of diabetes mellitus type II (DM type II) has been increasing relentlessly over the past few decades despite amassing a great body of evidence regarding its causation and prevention. **Objective:** To determine the practices of DM type II patients to prevent the disease in their children. **Methodology:** This is a mixed-methods study at a tertiary care teaching hospital. DM type II patients attending the department of endocrinology and its urban health center were the study participants. Data were collected using an investigator-administered questionnaire and in-depth interviews. A total of 137 patients were included in the quantitative part, and 16 in-depth interviews were conducted. Quantitative data were analyzed by SPSS software, and qualitative data were analyzed manually. **Results:** Nearly 62% of the patients had a family history of DM type II, 62% of the patients were aware of the genetic risk of the disease, and 26% of the patients had tried some form of preventive measure. Most of them advised their children to be careful about diet and exercise, but did not implement any specific or sustained behavioral change. The main reason was that the patients were not aware of the importance of the hereditary nature of the disease. Other reasons were children were grown up, were living separately, or did not appreciate the seriousness of the risk. **Conclusion:** There is a need to educate the patients about the hereditary risk of developing DM type II to empower them to implement preventive practices in their households.

Keywords: Diabetes mellitus type II prevention, family history of diabetes mellitus type II, genetic risk factor

Introduction

Diabetes mellitus type II (DM type II) is a condition of impaired glucose metabolism, which is increasing in incidence worldwide. Diet containing high proportion of refined carbohydrates, sedentary lifestyle, heredity, and smoking are other important risk factors. Long-standing raised blood glucose of uncontrolled diabetes leads to serious damage to the heart, blood vessels, eyes, kidneys, and nerves in a huge proportion of patients. More than 425 million people live with diabetes. The number of adults in the world with diabetes has increased almost four times in less than four decades, from 108 million in 1980 to 422 million in 2014.[1]

The world prevalence of diabetes among adults (aged 20–79 years) will increase to 439 million (7.7%) by 2030.[2] Over the past three decades, diabetes has transformed from a mild disorder of the elderly to one of the major causes of morbidity and mortality of the middle aged. Genetic predisposition seems to be a major risk factor among the South-East Asian population. Fast food/processed food culture along with sedentary behavior is the other major risk factor for DM type II in India.[3]

In the US population, family history of diabetes has a significant, independent, and graded association with the prevalence of diabetes. This association not only highlights the importance of shared genes and environment in diabetes but also raises the need for adding family history to public health strategies aimed at preventing the disease. Individuals with access to plentiful food and living in an area with scarce opportunities for physical activity are most vulnerable for

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the development of obesity and ultimately type II diabetes. Nevertheless, the development of type II diabetes in such environments also requires a permissive genetic component.[4] Family history is relatively easy to obtain and conveniently conveys information on genes and environment shared by close relatives. The association between family history of diabetes and risk for the disease has been well documented.[5]

DM type II develops in a complex condition involving a mix of genetic and environmental factors and so family history may be useful in public health as a tool for prevention.[6] Family history reflects not only genetic but also environmental factors and hence may serve as a better predictor of diabetic risk than either factor alone.[7]

The knowledge of familial susceptibility to DM type II could motivate a person to implement prevention strategies, such as maintaining normal body weight and adequate physical activity.[8]

However, as in any disease, knowledge need not translate to behavioral change. A randomized controlled trial of diabetes prevention program between those who were aware and those who were not aware of increased genetic risk showed no difference between the two groups.[9] Efforts to prevent and treat diabetes will be pivotal to achieving the global Sustainable Development Goal target of reducing premature mortality from noncommunicable diseases by one-third by 2030.[10]

The objective of the present study was to determine the practices among parents with DM type II to prevent the disease in their children.

Methodology

The study was conducted in Amrita Institute of Medical Sciences, Cochin, Kerala. DM type II patients attending the Endocrinology Outpatient Department and urban health center were included in the study. A cross-sectional, mixed-methods design was used in the study. In the initial quantitative part, data were collected using a pretested, investigator-administered, semi-structured questionnaire. In the subsequent qualitative part, in-depth interviews were conducted with DM type II patients.

Based on the knowledge of 46% of patients about DM type II in Gujarat, the minimum sample size calculated was 127. The total sample included in the study was 137 in the quantitative part. In the qualitative part, 16 in-depth interviews were conducted till saturation point was reached. The inclusion criteria were age below 75 years, married, and having at least one child.

Approximately half the sample size was taken each from the endocrinology department (75) and the urban health center (62). The patients from health center field practice area selected to include patients seeking primary health care also. The in-depth interviews were recorded in a voice recorder. The quantitative analysis was done using. SPSS version 20 software, (IBM, Corp) and qualitative data were analyzed manually. The interviews were transcribed and coded, and themes were identified. Ethical approval was obtained from the institutional ethical committee, and informed consent was obtained from the participants.

Results

A total of 137 patients were included in the quantitative part. The basic characteristics of the participants in the study are summarized in Table 1. Nearly 62% of the patients had family history of which 31% patients had father with DM type II, 15% of the patients had mother with DM type II, and 16% of the patients had both parents with DM type II. Analyses of the family history of one higher generation showed that on the paternal side, 5% of grandfathers and 6% of grandmothers had DM type II. On the maternal side, 4% of grandfathers and only 1% of grandmothers had DM type II. Almost 20% of the patients had at least one sibling with DM type II.

Regarding knowledge about various factors causing diabetes, 85 (62%) out of the 137 patients knew that heredity is a factor in the causation of DM type II. However, only 5% felt that they had comprehensive knowledge a patient should have about the disease. Nearly 67% of the participants answered that they do not know whether they had sufficient information about the disease they were suffering from.

However, only 52% of the patients believed that there is an increased risk of developing DM type II in their own children and 37% of the patients did not know whether their children is at an increased risk of developing the disease.

Overall 27% of the patients believed that they can play a role in preventing the onset of disease in their children and 34% felt that they cannot influence the onset of disease in their children. A great majority (74%) did not implement or follow any preventive measures in their family against DM type II occurring in their children. Of those who did implement some preventive measures, most of them were related to diet and physical activity.

In the qualitative part of the study, in-depth interviews were conducted to learn more about the preventive practices.

Most of the participants were aware of the hereditary risk factor in the causation of the disease. Many of them received the knowledge from books and media or from personal contacts. The importance of the hereditary risk was not emphasized by the treating doctors. One patient said that "doctors limit their advice to the particular problem only" and another said that "doctors advise about disease control but not about future generation."

Most patients had no clear understanding of the implication of hereditary risk. Hence, they were not aware that they had the responsibility and opportunity to prevent the disease in their

Table 1: Basic characteristics of diabetes mellitus type II patients (n=137)

	Male (n=65)	Female (n=72)
Age of participants in years (mean±SD)	73±4.62	64±5.37
Age of onset of DM type II among participants in years (mean±SD)	51.6±5.62	52.5±3.96
Number of participants diagnosed in private clinic	52	53

SD: Standard deviation, DM type II: Diabetes mellitus type II

children. One patient said that "surely has responsibility as a father to prevent disease in my children," but was handicapped by the lack of knowledge.

Many patients who were aware of the possibility of increased risk among children had taken some preventive measures. Most of them informed their children about their disease condition and warned them of the increased risk and the need to be careful. The most common advise was to reduce sugar intake and reduced consumption of bakery items and perform exercise. Some of them advised to reduce fat intake, increase vegetable consumption, and avoid meat and fried foods. Some advised their children to check for "sugar" frequently so as to detect the disease as early as possible. None of them claimed to have made any specific and consistent measure to prevent DM type II in their children.

Those who had tried to influence their children's behavior faced two major problems. The first one was their children were relatively older in their teens or twenties, so they did not take the advice of parents seriously. One patient said that "they will not listen" and another said that "they will not accept my advice." The second one was that children were grown up, were married or employed, and were living separately. Hence, the scope of influencing their behavior and implementing preventive measures at home was very limited even if they had the knowledge and the desire to do so.

Discussion

There are very few studies in which the effect of knowledge of the family history of DM type II on behavior has been investigated. Literature search did not reveal any study in which the practice of parents with DM type II in preventing DM type II among their children has been investigated.

This study showed that only 26% of the patients had employed or advised protective behavior against DM type II in their children. The study by Baptiste-Roberts *et al*. among African-Americans showed that those with a family history are more likely to engage in protective behavior as compared to those without a family history.[11]

A study by Bonita compared a group of university students with and without family history of DM type II. The data showed that the group with family history did not differ from the other group in terms of physical activity and diet.[12]

A study by Geetha *et al*. from Tamil Nadu showed that those with a family history of DM type II are prone to develop the disease early and lifestyle modifications must be implemented to prevent or delay the onset of disease.[13] However, they also did not study whether the parents implemented any specific measures to prevent the disease in their children.

Because DM type II is a chronic disease which can last lifelong, with severe long-term complications, it is imperative that the patients be given comprehensive information including the genetic aspects of the disease. That will empower them to implement protective lifestyle to prevent the onset of the disease in their children.

Recommendation

There is a need to give DM type II patients a comprehensive health education regarding the risk factors and preventive methods. Because there is a strong genetic component in the causation, it is important to inform the patients to implement preventive measures in their children from early childhood itself.

Limitations

The study participants were selected from the patients attending a tertiary care hospital and a urban health-care center, so the sample may not be representative of the general DM type II patients.

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Conflicts of interest

There are no conflicts of interest.

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