Original Article

ANALYSIS OF DIET, RISK FACTORS, TREATMENT PROFILE AND COMPLICATIONS OF DIABETES IN SURAT CITY

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ABSTRACT

This study was conducted among 69 known diabetes patients regarding diet, habits, risk factors, complications and treatment. We found that all the respondents were aware of the complications related to Diabetes. The diagnosis made by routine checkup was in 66.6% and by presenting complaints only 26% which showed that as diabetes is asymptomatic, its diagnosis is made late and patients are more prone to complications.

Key words: Diabetes, diet, complications, treatment

INTRODUCTION

The World Health Organization (WHO) has projected that the global prevalence of type 2 DM will be more than double from 135 million in 1995 to 300 million by the year 2025.[21,22] The greatest increase will be in India from 19.4 million to 57.2 million, unless effective preventive measures are implemented to curb this enormous increase. Currently India has got the largest number of diabetics and is being called as diabetic capital of the world.

It is now reasonably well established that risk of developing type 2 DM increases with age, obesity and lack of physical activity. It is also more common in individuals with family history of diabetes and in the members of certain racial and ethnic groups. Most of the recent increase in diabetes is lifestyle related. In India also the dramatic rise in prevalence of DM is closely associated with change in lifestyle like relative physical inactivity, central obesity and change in food habits particularly increased consumption of fast foods. As emphasized earlier, there has also been progressive urbanization, industrialization and modernization. It has been reported that increase in stress is accompanied by the various

changes mentioned above which lead to burden the neuro-endocrine system, increasing the risk for developing type 2 DM. These factors affect Indian population comparatively at younger age, particularly so in males.

Diabetes is a disease which remains undetected and causes late complications later in life. Diabetes presents a significant public health burden on the basis of its increased morbidity, mortality, and economic costs.[1-2] Individuals with diagnosed diabetes are at an increased risk for vascular disease, including micro vascular complications (e.g. retinopathy, neuropathy, and nephropathy) and macro vascular complications (e.g. coronary heart disease and stroke), and lower extremity amputations.[3-6] Improved glycemic control clearly reduces the risk of micro vascular disease among individuals with diagnosed diabetes and is associated with lower risk of atherosclerosis and macro vascular disease.[4, 7-12] While treatment for individuals with diabetes has traditionally focused on control of glycemia to reduce these vascular complications, there is growing evidence highlighting the importance of controlling blood pressure and cholesterol levels.[9, 13-16] In addition, while intensive control of glycemia, blood pressure, and cholesterol levels all improve

health outcomes for individuals with diabetes, control of blood pressure has been reported to be the most cost-effective intervention.[17]

Current American Diabetes Association (ADA) standards of medical care for individuals with diagnosed diabetes aim to reduce vascular complications through control of glycemia, blood pressure, and blood lipid levels, as well as through smoking cessation.[18] The ADA goal for control of glycemia is glycosylated hemoglobin (HbA$_{1c}$) level less than 7%; additional treatment is suggested for individuals with HbA$_{1c}$ levels greater than 8%. The goal for control of blood pressure is systolic blood pressure less than 130 mm Hg and diastolic blood pressure less than 80 mm Hg.[18] The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC) also now recommends this level of blood pressure control although the recommended diastolic target was 85 mm Hg until 2003.[19] The ADA goal for lipid management is aimed at lowering levels of low-density lipoprotein cholesterol to less than 100 mg/dl (2.59 mmol/l), increasing levels of high-density lipoprotein cholesterol to greater than 45 mg/dl (1.16 mmol/l) for men and 55 mg/dl (1.42 mmol/l) for women, and lowering levels of triglycerides to less than 150 mg/dl (1.7 mmol/l).[18] In addition, the National Cholesterol Education Program Adult Treatment Panel III (NCEP-ATP-III) sets a goal for total cholesterol levels of less than 200 mg/dl (5.18 mmol/l).[20] Aspirin should be prescribed for all patients over 40, Patients should be encouraged to stop smoking, and patients should be encouraged to lose weight if necessary, exercise, and eat healthily.

MATERIALS AND METHODS

This study was a questionnaire based qualitative study, which was conducted in private clinics of Ghod-dod area of surat city during March 2010 – April 2010. We selected 69 respondents who were already diagnosed diabetic patients. We collected information regarding signs, symptoms, counseling, treatment, BMI, etc from the respondents who attended the clinic through personal interview. We entered the data in Microsoft excel sheet and then analyzed the data using SPSS 15 software.

RESULTS

Age of the patients who had diabetes was <45 yrs (10%) and >45 yrs (90%), 61% were male and 39% were female, all participants were married. Mean age of males was 59.5 and mean age of females was 60.1. Almost 50% patients were retired, 35% were into business and 15% were into service. 54% were into moderate work, 44% into sedentary work and about 2% were into strenuous work. About 53% patients had family history of diabetes. 58% patients were vegetarian and 42% patients were non-vegetarian. 32% patients were having chocolate once every week, 62% were having ice-cream once every week. 60% had sweets once in a week. Most common symptom during diagnosis was numbness (62.3%), feeling tired most of the time (47.8%), unexplained weight loss (37.68%), extreme hunger (20.28%), frequent urination (10.1%), tingling (10.1%), very dry skin (15.9%), excessive thirst (4.34%), and sudden weight change (2.89%), sores that are slow to heal (10.14%). The risk factors associated are old age (60.8%), obesity (89.9%), family history (53.6%), prior history (1.44%), and physical inactivity (82.6%). The diagnosis was made by routine check up (66.6%) and by presenting complaints (26%). The patients having diagnosed diabetes <5 yrs (81.2%) and > 5yrs (18.8%). All patients were of type 2 diabetes mellitus. Fasting blood sugar of patients seen to be <100 (14.5%), 100-150 (42%), 150-200 (15.9%), >200 (5.8%), 21% didn't knew their fasting blood sugar. The frequency of clinical visits was <1 month (56.5%), 1-2 months (29%), >2 months (14.5%). The awareness about the complications among the patients was 100%. The most common diseases associated with diabetes seen in the patients were hypertension (85%), Ischemic heart disease (34%), chronic renal failure (10%), renal insufficiency (25%), B12 deficiency (5%), depression (5%), and hypothyroidism (15%). All patients were counseled about the treatment options available, advantages and disadvantages of each option, various complications of diabetes, about how to take care of diabetic foot, importance of wearing special footwear, importance of nail cutting, signs and symptoms of hypoglycemia and hyperglycemia, importance of keeping some biscuits/sweets with them when they go out, importance of keeping diabetic card with them, importance of exercise. Treatment of the patients was started immediately (21.7%), at 1 month (28.9%) and at 2 months (49.2%). All patients were taking poly unsaturated fatty acids, fiber diet and refined carbohydrates. Patients

involved in indoor exercises like yoga (71%), dancing (11.6%), asana (8.7%). Outdoor activities like running (4.3%), walking (84%) were adopted. The pharmacological treatment taken were regular insulin (13%), human mixtard (8.6%), increase in dose were required by 13% patients. 13 patients used syringe and 2 patients used pen device for giving insulin. Anti diabetic drugs used were sulphonamides (37%), biguanides (37%), meglitinides analogues (6.5%), thiazolidineones (17.4%), alpha glucosidase inhibitors (2.2%). 79.7% took regular medicines and 4.3% did not take regular medicines. Average expenditure of the patient per year was found to be 14,746 Rs.

DISCUSSION

In our study we can see that majority of people belong to age >45 years, so diagnosis of diabetes occurs late which results into its late complications. About 54% of patients had family history of diabetes, so family history is a proven risk factor. We can prevent developing diabetes just by eating ice cream. In particular, eating chocolate ice cream can do the trick to prevent diabetes. One way to prevent getting diabetes is to eat more dairy foods and ice cream is a dairy product. For every increase in dairy servings per day decreases your chance of developing diabetes. But you better your chances and maintain your weight if you eat low fat ice cream. Any ice cream will work against diabetes but chocolate seems to work even better. Dark chocolate has been shown to improve insulin sensitivity. Greater insulin sensitivity is something those suffering from type 2 diabetes will definitely benefit from. Dark chocolate is not very popular in ice cream but the benefits of eating ice cream is the same as dark chocolate when trying to prevent diabetes and help those who have the disease. Millions of people take expensive drugs to increase their insulin sensitivity and now it looks like something as inexpensive and widely available as dark chocolate and ice cream can work wonders. There is evidence that besides boosting insulin sensitivity, dark chocolate may lower blood pressure, improve blood vessel function, and reduce cholesterol. Ice cream and other dairy products can reduce stomach fat and digestion and decrease your chances of getting diabetes by 9 percent.[23] In our study we found that 22 (32%) respondents had chocolate, 43(62%) respondents had ice cream, and 39 (60%) had sweets once per

week which showed that respondents were aware of its importance in controlling diabetes.

Sweeteners also affect blood glucose. Many different types of sweetening agents are used in frozen desserts—sometimes in combination. Aspartame does not raise blood glucose, but be careful when you read labeling; "sugar-free" might simply mean that no sucrose has been added to the ice cream base. Mannitol and Sorbitol (examples of sugar alcohols) are absorbed very slowly but can raise blood glucose if consumed in excess. In addition, they can cause diarrhea when consumed in amounts greater than 10 grams per day for adults—less for children. Also, the cookies, candies and syrups sometimes added to ice cream can contain their own carbohydrates. It is the total amount of carbohydrate in each serving that is important rather than simply the amount of sugar. Those on insulin therapy should be able to adjust bolus (mealtime) insulin doses to match the grams of carbohydrate.[24] The most common risk factors associated with diabetes are obesity, sedentary life style, unhealthy eating habits, increased age, high blood pressure and cholesterol, history of gestational diabetes. We found 90% patients having obesity (BMI>25) which has additive effect on developing complications.

Associated conditions with diabetes are many but hypertension is major associated risk factor. According to statistical data 73% of diabetics have high blood pressure in the US (National Diabetes Statistics fact sheet, NIDDK, 2003). In our study we found 85% patients having hypertension and 34% had ischemic heart disease (IHD). So we can see that diabetes and hypertension are the major factors responsible for causing IHD. Other major associated diseases were hypothyroidism, renal insufficiency and B12 deficiency. Diabetes can also lead to complications which affect eyes, foot, kidney and many other systems. We found that 56% visited clinic regularly once a month so that they can have good glycemic control. We also found that all patients were aware about the long term complication which was a good thing. All patients were counseled regarding the do's and don'ts of diabetes. All patients were counseled by physician regarding various complications like neuropathy, retinopathy, nephropathy, IHD and stroke. They were also counseled regarding detecting hypoglycemia by symptoms and carry chocolate and biscuits with them. Studies have shown that yoga,

meditation, dancing, exercise are helpful in having good glycemic control. About 71% patients did yoga. Some of them were engaged in dancing also. Walking is the best exercise. About 84% patients were following walking as a useful exercise to have diabetic control.

Pharmacological treatment was also taken regularly by the patients. Most of them were on anti diabetic drugs. Only about 15 patients were on insulin. Out of them majority used syringe for giving insulin daily. Only 2 patients used pen device. So we can observe that pen device to give insulin is not so popular among the patients.

Only 21% patients started treatment immediately. Rest of them started at 1-2 months, which shows that people are not serious about diabetes as it is mostly asymptomatic. All patients used PUFA, fibers, refined carbohydrates in their daily dietary food which shows that people are aware about the dietary importance in sugar control. People are aware about various treatment options other than insulin and drugs. Majority of patients were on sulphonamides and biguanides. About 80% patients took regular treatment.

CONCLUSION

Clinical trials have shown conclusively that diabetes can be prevented by lifestyle modification, at costs generally considered acceptable to society. Evidence from these trials suggests that clinicians should recommend behavior changes for asymptomatic patients at high risk for diabetes. High-risk patients can be identified through clinical characteristics augmented with judicious screening by fasting glucose. Although the diabetes prevention trials used intensive strategies for effecting lifestyle change, clinicians can translate key elements from those strategies into brief, office-based counseling on physical activity and dietary change. Implementing diabetes prevention will require significant paradigm shifts for both patients and clinicians.

Contracting and self-monitoring may enhance self-efficacy and outcomes for patients. We must educate clinicians in training and in practice about the potential benefits of diabetes prevention and strengthen training for behavioral change within medical education. Diabetes prevention efforts need to be tailored for particular participants and settings. Despite implementation across very different cultures, however, these lifestyle prevention studies demonstrated remarkably consistent outcomes. Cultural adaptations for office-based counseling may be challenging in diverse communities; enlisting community resources may enhance these efforts. Relationships and social context are key factors for diabetes prevention. In these trials, close coaching relationships with study staff facilitated lifestyle change by participants. Successful diabetes prevention efforts will likely require enlisting important family members, enhancing clinician-patient relationships, practice innovations facilitating feedback to clinicians and patient follow-up, and broader societal changes supporting healthy lifestyles in the context of schools, communities, and workplaces. Even in an era when patients switch insurance carriers every few years, savings may accrue rapidly through prevention or delay of diabetes. Less costly group intervention in clinical settings bears further investigation, and studies of the effects on complication rates are needed. These diabetes prevention trials have shown dramatically how diabetes can be prevented or delayed through lifestyle changes. Many aspects of these prevention programs appear adaptable for use in clinical settings at present. Successfully implementing diabetes prevention on a large scale will require improved clinician-patient communications as well as innovative systems of care, making further translational research a priority.

Patients with diabetes have an average reduction in life expectancy of five to 10 years, mainly because of premature cardiovascular disease. The micro vascular complications specific to diabetes (retinopathy, nephropathy, neuropathy) also contribute to premature mortality and morbidity. The risk of vascular complications can be greatly reduced by tight control of glucose and blood pressure and by aggressive management of cardiovascular risk factors.

Early detection of complications, by systematic annual screening, allows prompt intervention that may prevent or delay the emergence of end stage disease A multifactorial approach to tightening the management of risk factors reduces the progression of micro vascular and macro vascular complications

Current recommendations are testing in adults of any age who are overweight or Obese (BMI _25 kg/m2) and who have one or more

additional risk factors to detect type 2 diabetes and assess risk for future diabetes in asymptomatic people. In those without these risk factors, testing should begin at age 45 years. If tests are normal, repeat testing should be carried out at least at 3-year intervals.

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