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Original Research Article

Relation of Healthy Eating and Exercise with Glycemic Control among Type 2 Diabetic Patients

Farah Habib[1], Anisa M Durrani[2]

[1]Research Scholar, [2]Professor,
Home Science Department, AMU, Aligarh.

Corresponding Author: Farah Habib

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ABSTRACT

Diabetes is fast gaining the status of a potential epidemic in India with more than 64.1 million diabetic individuals currently diagnosed with the disease. The increase in its prevalence is due to genetic predispositions, sedentary living, obesity, urbanization and change in lifestyle. The purpose of the present study is to find the effect of healthy eating and physical exercise on health outcome among type 2 diabetic patients by administering a compliance questionnaire. The questionnaire consist of 14 items that require a response on five- point likert- type scale and the health outcome was indexed by HbA1c level. Type 2 diabetic patients aged 30-60 years, with no comorbidity and minimum of six months duration of diabetes from Jawaharlal Nehru Medical College were selected. The Pearson correlation showed that healthy eating (r= -.475, p <.01) and exercise (r= -.266, p <.01) were significantly negatively correlated with health outcome. Only 21% of patients follow both recommended diet and exercise and their mean HbA1c level was 7. The result revealed that those who practice healthy eating habits and did more physical exercise have low level of HbA1c. It is concluded that less compliance score showed high HbA1c level leading to long term complications hence effecting health and quality of life.

Key words: Healthy Eating, Exercise, Health outcome.

INTRODUCTION

Diabetes is currently one of the biggest health concerns that the world is facing. [1] An astounding 382 million people are estimated to have diabetes, with dramatic increases seen in countries all over the world. [2] In India diabetes reaching endemic proportions with 64.1 million people currently diagnosed with it [3] and expected to reach the figure of 70 million by 2015. [4] WHO defines diabetes as a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Symptoms of Diabetes include frequent urination (polyuria), unusual thirst (polydipsia), increased hunger (polyphagia), excessive fatigue and weight loss, and slowly healing of wounds. Type 2 diabetes, however, may remain unnoticed and patients may not display any signs for years. Diabetes, if untreated, causes some serious health issues including blindness, kidney failure, stroke and heart diseases. The etiology of diabetes in India is multifactorial and included a number of lifestyle factors such as sedentary life, dietary factors, stress, environmental influences such as steady urban migration, and lifestyle changes.

Since diabetes is a chronic disease, the patients with diabetes must learn to practice healthy eating and exercise along

with medication. Exercise is to be encouraged because they improve insulin sensitivity independent of weight loss and acutely lowers blood glucose level. Evidence shows that at least 30 min of moderate exercise (brisk walking is often recommended), along with healthy eating habits, aids in preventing and managing diabetes and diabetes-related outcomes. [1,5]

Healthy eating in diabetes included modification in normal diet, 50-55% energy comes from carbohydrates, especially from complex carbohydrate-rich foods having either high fiber content or low glycemic index were included in diet. Foods such as vegetables, fruits, whole grains, and legumes are high in fibre, with low glycemic index. 30% or less energy intake derived from fats, provided that saturated fat is reduced MUFA and PUFA should be emphasized. The protein intake should be 15-20 % of the total intake. Limit intake of red meat and processed meat. Nuts, seeds, beans, poultry and fresh fish should be accentuated. High-energy foods, including those rich in saturated fats, and sweet, desserts, jams, jellies and snacks should not be eaten or less frequently eaten and in lower amounts. [6]

Significance of the study: Because of the increase in the prevalence of diabetes due to sedentary lifestyle, obesity, urbanization and change in lifestyle, it is necessary, not only for the diabetic people but also for other people to realize the importance of positive effect of healthy eating along with exercise on health outcomes and to inculcate these practices in their daily living.

Objective: The objective of the present study is to find out the effect between healthy eating and exercise on the glycemic control (HbA1c) among type 2 diabetic patients.

MATERIALS AND METHODS

The present cohort study was carried out on 200 type 2 diabetic patients visited at outpatients' clinic in endocrinology section, Jawaharlal Nehru medical college, Aligarh, in a period of 3 months. Patients who were 30-60 years of age, with no co morbidity, and minimum of six months duration of diabetes met the inclusion criteria. Pre-designed and pre-tested compliance questionnaire was used. HbA1c level was used as a measure of glycemic control. SPSS version 20 was used for the purpose of analysis. To determine the sample characteristics, standard descriptive statistics, such as Means and Standard Deviation were calculated. Pearson's Product Moment Correlation was calculated to find the correlations between compliance and glycosylated hemoglobin.

Characteristics of a Sample:

Demographic characteristics of the sample shows 50.5% of respondents were males and 49.5% were females. 22% subjects were in early (31-40), 36% in middle (41-50) and 42% in late (51-60) age group. Majority of the patients were urban (86%) and rest were rural people. 18.5% were illiterate and 35% were having a degree/post graduate certificate and only 4.5% had higher professions/ honours. Most of the subjects were from upper middle class (50.5%), 24.5% were from lower middle and only 10.5% were from upper class and rest belong to lower class. 88% of the study patients were married and 9.5% were widow. Mean BMI, HbA1c and fasting blood sugar at present of the subject was 26.24 $\pm$ 5.26, 8.09 $\pm$ 1.73 and 147.9 $\pm$ 35.3 respectively. The mean fasting blood sugar and HbA1c level at the time of diagnosis was 182.1 $\pm$ 27.4 with a range of 80 to 250mg/dl and 9.81$\pm$1.96 with a range of 5.4% to 14% respectively. The duration of disease range vary from six months to 35 years with a mean of 5.81 $\pm$ 6.11 years.

RESULTS

Table: 1 Correlations between Healthy eating, exercise and HbA1c (N=200)

Variables	Healthy Eating	Exercise
HbA1c	-.475**	-.266**

**. Correlation is significant at the 0.01 level (2-tailed).

Table 1 shows the Pearson Product Moment Correlation between healthy eating, exercise and glycemic control (i.e. HbA1c). Results of table 1 indicate that healthy eating (r= -.475, p <.01) and exercise (r= -.266, p <.01) is significantly negatively correlated with glycemic control.

Table 2: Patients responses on practicing recommended healthy eating and exercise and their mean HbA1c level.

Compliance	Frequency	Mean HbA1c
Follow Healthy eating with never or rarely following exercise regimen.	65	8.2%
Follow Healthy eating along with usually or always following exercise	119	7.6%
Never or rarely follow healthy eating and exercise.	16	10.35%

The table 2 shows that most of the subject (n=119) practice the recommended eating along with usually (more than 3 times in a week) or always recommended exercise and their mean HbA1c level was 8.2. 65 people said that they follow the recommended healthy eating with never, rarely or sometimes following exercise regimen and their mean HbA1c levels was 7.6. And only 16 patients said that they never or rarely follow the recommended eating and exercise regimen and their mean HbA1c level was 10.35%.

DISCUSSION

The present study indicated that as the compliance to healthy eating along with exercise increases, the HbA1c level decreases to the optimal level of the diabetic patients. It is also revealed from the patient's responses on eating and exercise compliance questionnaire that those patients who practice healthy eating and exercise always having lesser level of HbA1c (Mean = 7.6%) as compare to those who either only Practice healthy eating with rarely or no exercise (Mean = 8.2%). The present result is supported by guidelines from the American Diabetes Association and the European Association for the Study of Diabetes (EASD). [7] They stress the importance of healthy eating and exercise in the glycemic control among diabetic patients. Post et al. [8] also found that healthy eating including dietary fibre helps in lowering HbA1c level and fasting blood glucose by decreasing the glycemic index of foods. Decreased glycemic index would lead to smaller increases in blood glucose, and thus reduced blood glucose and HbA1c levels. Reduction in glycemic control will decrease the risk of microvascular diseases. [6]

Furthermore, Sabate [9] indicated that poor compliance with dietary therapy is the most important reason for poorly controlled blood sugar level supported the findings of this study that those patients who never or rarely follow dietary and exercise regimen had high HbA1c level (mean HbA1c=10.3%).

Exercise as a monotherepy will never give the optimal results but along with recommended diet, it have strong impact on the health outcome among type 2 diabetic patients as it improve insulin sensitivity, maintain weight and lowers blood glucose level. Guerci et al. [10] found that exercise have beneficial effects on weight reduction, which will make the diabetes patient´s insulin production sufficient again and have the favorable effects on glycosylated hemoglobin, blood glucose will become more normal.

CONCLUSION

Diabetes has become one of the top lifestyle diseases in the world. The number of diabetics around the world is increasing at an alarming rate, and vulnerability has reached to a level where anyone above 20 years of age is under risk of Diabetes. Hence the holistic approach of healthy eating along with exercise is vital not only to maintain weight but also for good glycemic control and it actually have a direct impact on the prevention of complications and quality of life.

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