Effect of Proper Lifestyle Modifications on the Management of Type 2 Diabetes Mellitus

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Abstract

Introduction: Diabetes mellitus (DM) comprises a group of metabolic disorders that share the common feature of hyperglycemia. It is closely linked to change in lifestyle such as decreased physical activity, a change in diet to the one of high-fat, high-energy intake, and rapid modernization into a western society. Patients with DM can be managed by lifestyle modifications in the form of diet, physical activity, and psychological assessment with care along with drugs.

In this, we studied the effects of comprehensive lifestyle modifications and their effect on glycemic control, blood pressure, lipid profile, body weight, and 24 h urinary protein for the management of DM.

Material and Methods: This study was performed between November 2015 and May 2016 at Indira Gandhi Institute of Medical Sciences, Patna. Lifestyle modification included diet instruction, exercise, weight reduction programs, and de-stressing session. Body weight, glycated hemoglobin (HbA1C), serum triglyceride, serum low-density lipoprotein (LDL), blood pressure, and 24 h urinary proteins were measured at baseline and after 6 months of lifestyle modification program.

Results: The results of lifestyle modification after 6 months of lifestyle modification were favorable with a mean reduction in HbA1C, LDL cholesterol, triglycerides, systolic blood pressure, diastolic blood pressure, and 24 h urinary protein are 0.09, 3.32, 16.88, 00.64, 3.68, 2.04, and −232.04, respectively.

Conclusion: Comprehensive lifestyle management is an important aspect of diabetes management.

Key words: Diabetes mellitus, Lifestyle modification, Treatment of diabetes mellitus

INTRODUCTION

Diabetes mellitus (DM) comprises a group of metabolic disorders that share the common feature of hyperglycemia. Type 2 DM is common and accounting 85% of diabetes in worldwide.[1] It is closely linked to industrialization, affluence, and increased life expectancy. India is rapidly changing into the diabetic capital of the world. The number of diabetic people in India will increase to 57.2 million in 2025. The prevalence of diabetes in rural India is low unlike the prevalence in an urban area. The reason for this is a change in lifestyle such as decreased physical activity, a change in diet to the one of high-fat, high-energy intake, and rapid modernization into a western society. Patients with DM can be managed by lifestyle modifications in the form of diet, physical activity, and psychological assessment with care along with drugs.

This study is intended to know the effect of lifestyle modification such as dietary advice, exercise, and de-stressing session with yoga and weight reduction in diabetes management.
MATERIALS AND METHODS

Design
This study used a single-group experimental design with a proper assignment with repeated measures.

Subject
A total of 50 patients were recruited in the study from outdoor of General Medicine Department of Indira Gandhi Institute of Medical Sciences, Patna. All patients in this study were suffering from DM type 2. Key inclusion and exclusion criteria are shown in Table 1. Written informed consent was obtained from the patients. They were screened properly and recruited for the study. Patients with advanced complications such as severe cardiovascular comorbidities, renal failure, and retinopathy were excluded from the study. Patients from both sexes were included in the study Table 1.

Procedure
Each patient was counseled and educated about the diet management, exercise, and de-stressing session with yoga.

Diet instructions were given according to the patient dietary habit and were on the basis of ADA 2010 recommendation which includes:
1. 60–65% of carbohydrates of total calorie.
2. 10–15% of protein of total calorie.
3. <25% of fats of total calorie.
4. 25 g fiber/1000 Kcal.

The physical program was well instructed to the patients after proper screening. They were instructed to do brisk walking at least 150 min/week in different divided sessions. This moderate-intensity aerobic physical activity should raise not more than 50–70% of maximum heart rate. People were encouraged to perform resistance exercise at least 3 times a week. Resistance exercise advised to the patient was seated leg press, chest press, pull down, and leg extension.

De-stressing program included yoga and pranayama. Patients were instructed with proper counseling about the importance of distressing session and their effect on mental and physical well-being. Deep breathing pranayama and concentration yogasana were instructed to the patients.

Pharmacological Treatment
All patients were instructed to take antidiabetic drugs as usual they were taking before the start of the study. They were also instructed to continue other medications such as antihypertensive and lipid-lowering drugs.

Measurements and Data Collection
Following measurements were collected at baseline and again measured after 6 months. The change in outcome measure was analyzed after 6 months.
1. Glycosylated hemoglobin.
2. Serum low-density lipoprotein (LDL).
3. Serum triglyceride.
5. Body weight.
6. 24 h urinary protein.

Change in drugs, being used by the patient, was not included in measure of lifestyle modification effect on diabetes type 2 management due to complexity in measurement.

RESULT

Clinical and biochemical variables such as weight, blood pressure, glycosylated hemoglobin, serum LDL, serum triglyceride, and 24 h urinary protein were measured at baseline and at the end of follow-up period (6 months) and shown in Table 2. It was noticed that after lifestyle modification, all clinical and biochemical variables were improved and mean changes in these variables are shown in Table 2.

In my study, mean reduction in HbA1C, LDL cholesterol, triglycerides, systolic blood pressure (SBP), diastolic blood pressure (DBP), and 24 h urinary protein is 0.09, 3.32, 16.88, 0.64, 3.68, 2.04, and −232.04, respectively.

DISCUSSION

We conducted a study on 50 patients of type 2 DM to know the effect of lifestyle modification such as dietary advice, exercise, and de-stressing session with yoga and weight reduction. Lifestyle modification in diabetes management is well-known fact but not well practiced by physicians in field. In my study, mean reduction in HbA1C, LDL cholesterol, triglycerides, SBP, DBP, and 24 h urinary protein is 0.09, 3.32, 16.88, 0.64, 3.68, 2.04, and −232.04, respectively.

In this study, there is an improvement in glycated hemoglobin (HbA1C) by 0.09 that is less than the results of the meta-analysis reported by Norris et al. which showed a decrease in HbA1C of 0.28% at the end of 3 months. For a 1% reduction in HbA1C, there was 14%
This suggests that my finding of 0.09% change in mean found in my study group was not significant compared to the control group (−0.29; 95% CI, −0.52–0.06, P = 0.014), HbA1c (−0.37; 95% CI, −0.59–0.14, P = 0.001), SBP (−0.16; 95% CI, −0.29–0.03, P = 0.016), and DBP (−0.27; 95% CI = −0.41–0.12, P < 0.001). There was no difference between the intervention and control groups in high-density lipoprotein cholesterol (0.05; 95% CI, −0.10–0.21; P = 0.503) and LDL-cholesterol (−0.14; 95% CI, −0.29–0.02; P = 0.092).

**CONCLUSION**

Comprehensive lifestyle management is an important aspect of diabetes management but the most neglected part of the management program. This study is of very short duration and includes only 50 patients. Further research is needed with larger group with longer follow-up to see the effect of lifestyle modification.

**REFERENCES**


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