International Journal of Advanced Scientific Research
ISSN: 2456-0421; Impact Factor: RJIF 5.32
Received: 28-02-2019; Accepted: 02-04-2019
www.allscientificjournal.com
Volume 4; Issue 3; May 2019; Page No. 23-25

Effect of nutrition education program on the blood glucose levels of type 2 diabetes patients

Bindhya Babu[1*], Dr. Rupali Sengupta[2]
[1-2] M.Sc. Clinical Nutrition and Dietetics, Dr. BMN College of Home Science (Affiliated to SNDT Women's University), 338, Rafi Ahmed Kidwai Marg, Matunga, Mumbai, Maharashtra, India

Abstract
Large population of the world is affected with Type 2 diabetes as a result of poor lifestyle and dietary habits. Dietary management is an important component in the management of diabetes. The objective of the study was to provide nutrition education to type 2 diabetes individuals and analyse the effect of nutrition education program (NEP) on their blood glucose levels. The study was carried out among 100 volunteer patients with Type 2 diabetes who used only oral anti-diabetic drugs and did not have any other chronic disease. The samples were selected from diabetes clinics in and around Mumbai. The patients were divided into two groups of study, experimental and control group comprising of 50 patients each. Biochemical parameters like fasting and post prandial blood glucose levels were noted from patients' clinical test records. Nutrition education was provided to the experimental group, on an individualized counselling based method with 4 contact session after the first meet. The education included the description of diabetes, the complications, the importance of nutrition in diabetes, nutritional elements and the food groups, low glycaemic index foods, food exchange lists, food preparation alternatives, and the changes to be done in nutritional habits. Post NEP there was a decline in mean fasting and post prandial blood glucose levels seen in the experimental group while there was no much change observed in the control group indicating positive effect of nutrition education provided.

Keywords: type 2 diabetes, nutrition education, fasting blood glucose, post prandial blood glucose

1. Introduction

"Diabetes mellitus is a chronic disease caused by inherited and/or acquired deficiency in production of insulin by pancreas, or the insulin produced is ineffective. Such a condition leads to increased concentrations of glucose in the blood, which in turn damages many of the body's systems, in particular the blood vessels and nerves" [1].

According to American Diabetes Association (ADA) 2003, Type 2 diabetes, a result of insulin resistance, is the most prevalent form of diabetes today. Of individuals diagnosed with diabetes, 90-95% suffered from type 2. Optimizing metabolic control, preventing acute and chronic complications and improving quality of life are key objectives in the management of diabetes. The ADA also added that diabetes education was considered an essential component in the management of diabetes. Established diabetes education programs had demonstrated remarkable success in improving metabolic outcomes such as glycated haemoglobin (HbA1C), blood lipids and blood pressure [2].

These individuals must initiate life dependent behavioural changes in order to obtain optimal glycaemic control, lipid profiles and blood pressure [3]. Nutrition therapy encompasses all aspects of diet. Nutrient content of the diet affects the metabolic control of not only blood glucose but also lipids and blood pressure. Food selection plays a key role in the nutrient content of an individual's diet. Therefore, careful food selection is crucial to those with metabolic diseases such as diabetes. Medical nutrition therapy offers professional instruction and support in nutrition and diet. Therapy is tailored to the specific needs of the treatment group and/or individual.

This study was an attempt to impart awareness on diabetes through individualised nutrition counselling with a specific focus on dietary interventions and importance of physical activity.

Statement of the Problem

The purpose of the study was to evaluate the impact that a nutrition education component had on diabetes individuals. The aim was to determine if nutrition and diet focused education, in addition to basic diabetes education, would alleviate glycaemic control and associated clinical outcomes.

Significance of Study

Every day an individual suffers, either physically or emotionally from diabetes and its related complications. Diabetes presents a challenge to both patients and health care providers. Patients are confronted with obligations for behavioural changes that are life dependent. Professionals seek to offer the most effective treatment possible to better the lives of those enduring the complications that diabetes presents. Successful education programs are those which exemplify significantly improved measured outcomes, whether it is clinical, behavioural or psychological. With evaluation of established education programs, successful interventions can be created. With development of effective diabetes educational programs, diabetics can gain more knowledge, support, guidance and ultimately, control of their condition.

2. Objectives

1. To assess the blood glucose levels of subjects through medical reports.
2. To provide individualized nutrition education program to the experimental group.

3. To compare pre and post results of blood glucose levels between experimental and control group through statistical data.

3. Methodology

3.1 Study Area

The study was conducted in Mumbai city, Maharashtra, India. Mumbai urban, being one of the largest metropolitan cities in the world, has a heterogeneous population with diverse cultural, religious and economic backgrounds. Due to its diverse economic background; the city provides an ideal setting to obtain a range of type 2 diabetes patients for the study. Two clinics were selected from Mumbai city (Maharashtra, India) by purposive sampling and samples were selected from them.

3.2 Sampling Method

Sampling technique used is convenience sampling. Convenience sampling is a non-probability sampling technique where subjects are selected because of their convenient accessibility and proximity to the researcher.

3.3 Sample Size

100 individuals with type 2 diabetes were selected by purposive convenient sampling and divided into control group (50) and experimental group (50).

3.4 Biochemical Assessment

Estimation of Blood Glucose Levels

Blood glucose was estimated by clinical tests carried out by the diabetes clinics from where the samples were selected. Records of fasting (8 hrs fasting) and post prandial blood sugar (2 hours after food intake) levels were taken from clinical reports of the patient.

Statistical Analysis

The results were analysed using the SPSS software. Paired t test was used to determine the significant difference between the mean of two groups. Sig. (2-tailed) or p value <0.0005 indicates significant difference.

4. Results and Discussions

Data was analysed for 100 subjects, 50 subjects each, in experimental and control group Biochemical parameters of fasting and post prandial blood sugar levels were assessed through pathological lab reports which were NABL accredited and the standards laid down by NABL were in accordance with ISO 15189:2012.

4.1 Fasting Blood Glucose

During pre-test, subjects of the experimental and control group, both had similar mean blood glucose which ranges from 149.54 ± 25.342 mg/dl and 151.18 ± 10.560 mg/dl respectively. The NEP module imparted to experimental group**,** included education on fasting blood glucose ranges and their indication, importance of checking blood glucose levels and how to maintain normal blood sugar levels through physical activity and exercise. Post NEP a mean reduction in fasting blood glucose level of experimental group was observed while the control group did not show much difference.

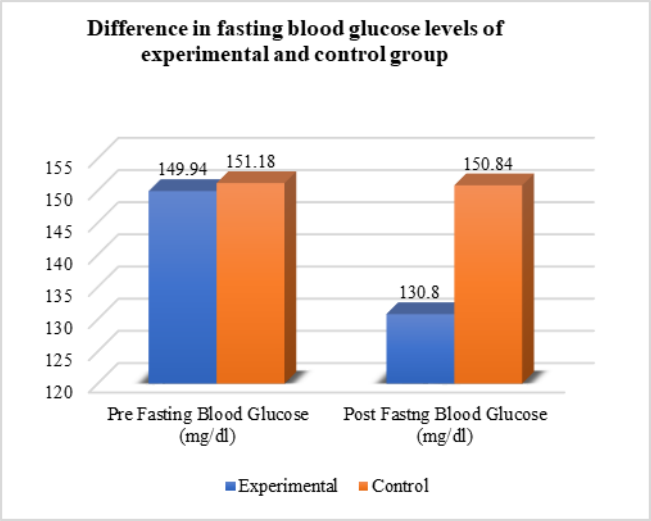

Fig 4.1: Change from pre to post values of fasting blood glucose levels in experimental and control group.

Paired Samples Statistics

Table 4.2: Paired Sample Statistics for Pre to post change in experimental group

Experimental Group		Number of subjects	Mean ± Standard deviation	Sig. (2-tailed)
Pair 1	Pre Fasting blood glucose values	50	149.94 ± 25.342	.000
	Post Fasting blood glucose values	50	130.80 ± 10.560	

Table 4.3: Paired Sample Statistics for Pre to post change in control group

Control Group		Number of subjects	Mean ± Standard deviation	Sig. (2-tailed)
Pair 1	Pre Fasting blood glucose values	50	151.18 ± 23.937	.863
	Post Fasting blood glucose values	50	150.84 ± 23.328	

Figure 4.2 showed significant mean reduction of fasting blood glucose level in experimental group, from pre 149.94 ± 25.3 mg/dl to post 130.80 ± 10.5 mg/dl. Thus indicating a positive effect of nutrition education in lowering fasting blood glucose levels of experimental group and in control group no significant mean reduction was observed. A highly significant difference was observed in experimental group at p = 0.05 (p =0.000).

4.2 Post Prandial Blood Glucose

During pre-test, both experimental group and control group had a mean post prandial blood glucose level of 226.80 ± 54.595 mg/dl and 219 ± 37.212 mg/dl respectively. The NEP module was imparted to experimental group on post prandial blood glucose ranges and their indication, importance of checking blood glucose level s and how to maintain normal blood glucose levels through physical activity and exercise. However Post NEP showed a mean reduction in post prandial blood sugar level of experimental group was observed while the control group showed a marginal increase in blood glucose level.

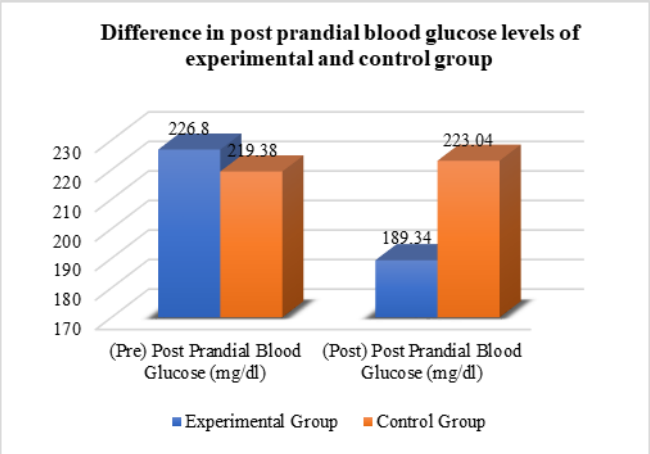

Fig 4.2: Change from pre to post values of post prandial blood glucose levels in experimental and control group

Paired Samples Statistics

Table 4.5: Paired Samples Statistics for Pre to post change in experimental group

Experimental Group		Number of subjects	Mean ± Standard deviation	Sig. (2-tailed)
Pair 1	Pre-prandial blood glucose values	50	226.80 ± 54.595	.000
	Post prandial blood glucose values	50	189.34 ± 37.212	

Table 4.6: Paired Samples Statistics for Pre to post change in control group

Control Group		Number of subjects	Mean ± Standard deviation	Sig. (2-tailed)
Pair 1	Pre Fasting blood glucose values	50	219.38 ± 45.907	.863
	Post Fasting blood glucose values	50	223.04 ± 52.254	

When post prandial study was recorded after a gap of 2 hours, a significant decline in post prandial blood glucose level was noted in the experimental group statistically. A highly significant difference between pre - post prandial blood glucose and post- post prandial was observed at p = 0.05 (.000) as compared to control group which showed an insignificant difference between pre and post – post prandial test.

5. Summary and Conclusion

Difference in fasting blood glucose and post prandial blood glucose levels of both groups were assessed. Experimental group showed a statistically significant mean reduction in fasting blood glucose from pre 149.94 ± 25.3 mg/dl to post 130.80 mg/dl ± 10.5 and post prandial blood glucose levels from pre 226.80 ± 54.5 mg/dl to post 189 ± 37.2 mg/dl while control group showed an insignificant difference between pre and post-test of the same parameters.

Thus overall results indicated that NEP had a positive impact in lowering fasting and post prandial blood glucose levels, among the experimental group subjects.

Ethical Approval: The study was approved by the jury members of the institutional ethical committee (IEC) which was established in 2012 as per ICMR guidelines.

6. References

1. World Health Organization & International Diabetes Federation. Definition and diagnosis of diabetes mellitus and intermediate hyperglycaemia: report of a WHO/IDF consultation. Geneva: World Health Organization, 2006.
2. American Diabetes Association. Evidence-based nutrition principles and recommendations, 2003; 78:411-413. www.Diabetes.org.AmericanDiabetes Association.
3. American Diabetes Association. Diabetes Care. 2016; 39(Supplement 1): S86-S93. https://doi.org/10.2337/dc16-S014
4. Awasthi A, Rao CR, Hegde DS, *et al*. J Prev Med Hyg. 2017; 58(1):E56-E62. Review
5. Kavitha V, Saradha Ramadas. V Prevalence of Diabetes and Associated risk factors among Selected Type II diabetes. International Journal of Science & Research (IJSR) ISSN (online):2319-7064, Vol. 3.
6. Levenduski EA. Florida State University Libraries, 2004. Retrieved from http://diginole.lib.fsu.edu/islandora/object/fsu:181465/datastream/PDF/view
7. Lindstorm J, Louheranta A, Manelin M, *et al*. The Finnish Diabetes Prevention Study (DPS): Lifestyle intervention and 3 year results in diet and physical activity. Diabetes Care, 2003; 26:3230-3236.
8. Ramachandran A, Snehalatha C. Current scenario of diabetes in India. J Diabetes. 2009; 1:18-28. doi: 10.1111/j.1753-0407.2008.00004.x. [Pubmed]
9. World Health Organization. Global report on diabetes. World Health Organization, 2016. http://www.who.int/iris/handle/10665/204871