International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 07-02-2019; Accepted: 08-03-2019
www.medicalsciencejournal.com
Volume 5; Issue 4; April 2019; Page No. 28-29

Trimodular approach in achieving glycemic control in suburban type 2 diabetic mellitus

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Abstract
Aim: to study the role of teamwork in achieving glycemic control in rural type 2 diabetes mellitus patients using a cost effective trimodular approach.
Material and Methods: Of the 200 selected diabetic patients 60 subjects were eligible for the study.
Inclusion criteria: 1) Age: men and women between age group 20 years to 70 years. 2) Type 2 Diabetes mellitus, 3) uncontrolled FBS and PPBS 4) HbA1c between 7 to 10 %.
Exclusion criteria: Type 1diabetes mellitus, Pre-existing renal, hepatic or cardiac disease, Hba1c > 10 %. A triad was established between our center, health worker, and diabetes educator.
Results: 60 patients were randomly divided into two groups i.e. group A and B which comprised of 30 patients each. Group A patients were also regularly monitored regularly during the study period than compared to Group B. On first follow up after 6 it was observed that mean FBS, PPBS, HbA1c, was significantly low in the group of patients who had regular follow up i.e p <0.05 than compared to other group.
Conclusion: A systematic approach and close monitoring that increased the adherence to medication, diet, and counselling would help in better glycemic and lipemic control and prevent long term complication.

Keywords: glycemic level, type 2 diabetes mellitus, trimodular approach, health worker, fasting blood glucose, post prandial blood glucose, lipid levels, body mass index

Introduction

Globally prevalence of type 2 diabetes mellitus is increasing. In high income countries the fifth most cause of death is diabetes and by the end of the year 2011 it was estimated that 4.6 million's death occurred due to diabetes and diabetes related co-morbidities. It is also known now that the majority of cases of Diabetes mellitus are type 2 and it is predominantly seen in the age group of 39 to 60 years [1-2].

The increase prevalence in type 2 diabetes mellitus is also associated with obesity, hypertension, and sedentary lifestyle. Over the last 18 to 20 years in the USA, there is a major jump in proportion of adults with body mass index ≥30 kg/m2 has increased from 28% to 36% especially in the age group 40–74 years [3]. However, despite very good clinical recommendations for Diabetic individuals to adopt a healthier and better lifestyle, there is poor adherence to diet and exercise.

Type 2 diabetes mellitus commonly occurs in people over and above the age of 40 years. Now days it is becoming increasingly more common in children, adolescents and young adults which could be due to low physical activity and unhealthy eating patterns which is eventually leading to obesity.

Majority of Type 2 diabetes patients do not achieve good glycemic control with exercise and diet despite knowing diet and exercise help in good glycemic control, these patient have to be initiated on pharmacotherapy or the doses of medication have to be stepped up. Patient who doesn't have proper diet and exercise and whose glycemic levels in not under controlled with monotherapy will require combination therapy of Oral antidiabetic drugs, some patient may require insulin for better glycemic control. Good glycemic control is required as it can prevent complication which could be detrimental for the individual [4-5]. All practice guidelines (AACE, ADA, EASD, IDF) emphasize the need for good glycemic control and if any concomitant risk factors like hypertension and dyslipidemia should also be treated. The major issue with the poor adherence is polytherapy, complex regimen's, and poor explanation of do and dont's for diabetic patients. These patients should be explained about the importance of each medication and good adherence to therapy can prevent future complications [6].

The World Health Organization (WHO) data have shown that the people living in developed countries also with chronic diseases on long term medication therapy have average adherence of 50% to their therapy [7].

Material and methods

Of the 200 selected diabetic patients 60 subjects were eligible for the study.
Inclusion criteria: 1) Age: men and women between age group 20 years to 70 years. 2) Type 2 Diabetes mellitus, 3) uncontrolled FBS and PPBS 4) HbA1c between 7 to 10 %.
Exclusion criteria: Type 1diabetes mellitus, Pre-existing renal, hepatic or cardiac disease, Hba1c > 10 %. Tie up was made with the multipurpose health worker to visit the patients home and educate the patients on importance of regular treatment and diet in addition to distribution and observation of medicine intake. A triad was established between our center, health worker, and diabetes educator.

Results

60 patients were randomly divided into two groups i.e. group A and B which comprised of 30 patients each.

Patients were evaluated at the start of study with FBS, PPBS, HbA1c and lipid profile. Patients were followed up at 6 months with measurement of FBS, PPBS, HbA1c and lipid profile. Group A patients were also regularly monitored regularly during the study period. Data obtained was measured with SPSS version 17 software the difference in mean was compared in both groups using independent t test. P value less than 0.05 was considered as significant.

A triad was established between our center, health worker, and diabetes educator. These 30 patients of Group A were monitored on daily basis with the help of Health Worker for proper diet intake, regular intake of OHA without skipping of a single dose in entire 6 months duration whereas the Group B were monitored on Day 1 and these patient of Group B were explained the about the drug dosage, frequency of drug intake, with complete diet explanation and Life style modification, these both groups were followed on monthly basis in OPD clinic for review. In Group A there were 20 males (66.7%) and 10 females (33.3%) compared to Group B (males 17 (56.7 %) and females 13 (43.3%) P value = 0.426, chi square0.635.

Guillausseau PJ et.al and Osterberg L *et. al.* 2005, [8-9] had shown, the importance and significant adherence to therapy have a good impact on glycemic levels. Donnan PT et.al 2002 [10] study has shown that only one in three person with Type 2 diabetes had adequate adherence to OADs. Administration of Once a day tablet was associated with greater adherence than multiple tablets. Non-adherence to therapy in type 2 diabetes patient deprive them from benefits of drugs and these patients are more prone for complication.

In the present study it was observed that there was no significant difference statistically in the mean age, gender, FBS, PPBS, HbA1c ($p > 0.05$) at the onset of study. After completion of 6 months it was observed that mean FBS, PPBS, HbA1c, was significantly low in the group of patients who had regular follow up i.e. $p<0.05$ than compared to other group.

Table 1

	Group A		Group B		t value	p value
	Mean	SD	Mean	SD		
AGE	42.1	10.7	40.5	11.7	.553	0.582
FBS	177.6	25.1	188.6	40.5	-1.260	0.213
PPBS	229.6	46.4	248.0	43.2	-1.595	0.116
HbA1C	9.2	.5	8.9	.5	1.784	0.080
After 6 Month						
FBS 6 month	140.5	19.7	210.2	45.5	-7.696	<0.001
PPBS 6month	171.8	28.3	261.1	50.2	-8.477	<0.001
HbA1C 6 month	7.3	.3	9.0	.6	-13.903	<0.001

Conclusion

Adherence to therapies is a primary factor that determines the success of therapy and decreases the negative consequences not only for the patient but also for the health care provider. A single contact with physician could not achieve good glycemic control as seen in group B when compared to a systematic approach and close monitoring that increased the adherence to medication and diet as demonstrated in group A.

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