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Impact of patient counseling on diabetes mellitus patients in the territory care hospital erode district

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ABSTRACT

Diabetes is the common term for several metabolic disorders in which the body no longer produces insulin or uses the insulin it produces ineffectively. The study was to assess the impact of patient counseling on diabetes mellitus patients in the Erode district. All of the selected patients were from rural area and all of the same shared the similar life styles and physical activities. There were 80 patients were selected in this study and the study period was 6 months. Patients were advised to quit smoking, chewing betel nuts and consuming alcohol during the entire study period. The study was based on some inclusion and exclusion criteria. Finally we conclude that the patient counseling is essential for improvement of health status.

Key words: Patient counseling, Diabetic, Hyperglycemia.

INTRODUCTION

Diabetes mellitus is a condition in which a person has a high blood sugar level, either because the body doesn't produce enough insulin, or because body cells don't properly respond to the insulin that is produced. Insulin is a hormone produced in the pancreas which enables body cells to absorb glucose, to turn into energy. If the body cells do not absorb the glucose, the glucose accumulates in the blood, leading to vascular, nerve, and other complications [1-4].

CLASSIFICATION OF DIABETES MELLITUS [5-7]

a) Type 1 (IDDM)

IDDM results from a cellular mediated autoimmune destruction of the beta cells of the pancreas. Patients with this form of diabetes are dependent upon insulin for survival. Type 1 commonly occurs in childhood and adolescence but may occur at any age.

b) Type 2 (NIDDM)

Individuals with NIDDM have insulin resistance and relative insulin deficiency. Primary treatment centers on beta cell preservation and improving insulin resistance. T2DM is often asymptomatic in its early stages. Individuals with undiagnosed T2DM are at increased risk for developing macro- and micro vascular complications.

c) GDM

Gestational Diabetes Mellitus is defined as any degree of glucose intolerance with onset or first recognition during pregnancy. Six weeks or more after the pregnancy ends, a woman with GDM should be tested to rule out type 1 or 2 diabetes or IFG/IGT.

d) Pre-diabetes

Both Impaired Glucose Tolerance (IGT) and Impaired Fasting Glucose (IFG) have been categorized as pre-diabetes. IFG has been defined as fasting plasma glucose of $\geq$ 100 mg/dl but < 126 mg/dl. IGT is defined as a 2-hour oral glucose tolerance test value (OGTT) of $\geq$ 140 mg/dl, but < 200 mg/dl.

EPIDEMIOLOGY OF DIABETES MELLITUS[14]

India leads the world with largest number of diabetic subjects earning the uncertain distinction of being termed the "diabetes – capital of the world". As per WHO, India will be the nation with highest number of diabetics in the world by 2030 followed by China and then US11. The International Diabetes Federation (IDF) estimates the total number of diabetic subjects to be around 40.9 million in India and this is further set to rise to 69.9 million by the year 2025.12

DIAGNOSIS OF DIABETES MELLITUS[16,17,18]

Diagnosis of diabetes is done by measuring blood/ plasma glucose level.

a) OGTT

Following an overnight fast, a morning fasting blood sugar is drawn and patients ingest a 75 g glucose load. Then blood samples are drawn at half an hour intervals for 2 hrs and then at 3 hrs. In normal subjects, the blood glucose returns to normal in less than 2 hrs. A normal OGTT

Fasting plasma glucose = 70-100 mg/dl
2 hrs plasma glucose   = 90-140 mg/dl

b) FPG

Blood is drawn from the patients after an overnight fast. Normal = 70 - 100 mg/dl. The diagnosis of diabetes mellitus may be confirmed in the patient with two or more fasting plasma glucose levels $\geq$ 140 mg/dl.

c) HPPG (2 Hour Post Prandial Plasma Glucose Level):

Blood glucose level is drawn 2 hrs after the patient ingests a 100g glucose load. In non diabetic patients, blood glucose returns to normal in less than 2 hrs, whereas hyperglycemia persists in diabetic patients.

d) HbA1C:

HbA1C may be a more reliable index than the degree of hyperglycemia.

In non diabetic patient   = 3 – 7%
Poorly controlled patient = 8 – 20% 14

COMPLICATIONS OF DIABETES MELLITUS[18,19]

The long term effects of DM include progressive development of specific long term complications of retinopathy with potential blindness, nephropathy that may lead to ESRD, and/or nephropathy with the risk of foot ulcers, amputation, Charcot's joint and feature of autonomic dysfunction including sexual dysfunction.

a) MICROVASCULAR COMPLICATIONS
Diabetic nephropathy

Diabetic nephropathy is a clinical syndrome characterized by excessive urinary albumin excretion, hypertension, and renal insufficiency. Nephropathy is a frequent complication of type 1 and type 2 diabetes mellitus. Patients who have type 2 diabetes are commonly found to have albuminuria and overt nephropathy soon after or at the time of diabetes diagnosis.17

Diabetic retinopathy

Development of diabetic retinopathy in patients with type 2 diabetes was found to be related to both severity of hyperglycemia and presence of hypertension. Retinopathy may begin to develop as early as 7 years before the diagnosis of diabetes in patients with type 2 diabetes.16 Adequate control of blood glucose, blood pressure, and lipid levels can significantly decrease the progression and morbidity of diabetic retinopathy.17

Diabetic Neuropathy

Diabetic peripheral neuropathy (DPN) is resulting in impaired sensation or pain in the feet or hands, slowed digestion of food in the stomach, carpal tunnel syndrome, precursor for foot ulcers, and other nerve problems.17

b) MACROVASCULAR COMPLICATONS
Cardio vascular:

People with diabetes are 2 to 4 times more likely to develop cardiovascular disease (CVD) than those without diabetes. In patients with insulin resistance, the disease tends to accelerate to atherogenesis long before the onset of hyperglycemia.

Cerebrovascular

Cerebrovascular disease results from either inadequate blood flow to the brain (i.e. cerebral ischemia) or from hemorrhages into the parenchyma or subarachnoid space of the central nervous system (CNS).17

Peripheral arterial disease

Peripheral arterial disease (PAD) is the major risk factor for lower extremity amputations. The risk of development of PAD increases threefold to fourfold in patients with diabetes mellitus.17

Drug induced hyperglycemia

•   Atypical Antipsychotics - Alter receptor binding characteristics, leading to increased insulin resistance.
•   Beta-blockers - Inhibit insulin secretion.
•   Calcium Channel Blockers - Inhibits secretion of insulin by interfering with cytosolic calcium release.
•   Corticosteroids - Cause peripheral insulin resistance and gluconeogensis.
•   Fluoroquinolones - Inhibits insulin secretion by blocking ATP sensitive potassium channels.
•   Naicin - They cause increased insulin resistance due to increased free fatty acid mobilization.
•   Phenothiazines - Inhibit insulin secretion.
•   Protease Inhibitors - Inhibit the conversion of proinsulin to insulin.
•   Thiazide Diuretics - Inhibit insulin secretion due to hypokalemia. They also cause increased insulin resistance due to increased free fatty acid mobilization.

The study was to assess the impact of patient counseling on diabetes mellitus patients in the Erode district. This was the comparative study before and after the patient counseling.

METHODOLOGY

Study was done interritory care hospital, Erode district. All of the selected patients were from rural area and all of the same shared the similar life styles and physical activities. There were 80 patients were selected in this study and the study period was 6 months. Patients were advised to quit smoking, chewing betel nuts and consuming alcohol during the entire study period. The study was based on some inclusion and exclusion criteria as under:

Inclusions criteria

Both male and female patients had age more than 40 years old and less than 70 years old were included in this study who had known diabetic for more than 3 years.

Exclusion criteria

Patients having complicated and other communicable diseases had not been taken into consideration and patient taking insulin injections, pregnant and nursing mothers were also excluded from this study.

STUDY PROCEDURE

Phase 1: Literature survey about diabetes.
Phase-2: Detailed counselling
Phase-3: Data collection and analyses.

COLLECTION OF DATA

The main sources of collecting data are
➢   Patient interview.
➢   Patient's prescription.

Patient counseling points on counseling are given below

a) Diet

Diet is the most important thing in controlling the diabetes. Diet should be such that it maintains ideal body weight by providing adequate nutrition along with normal blood sugar level. Whereas diet of type-2 diabetic patients should contain 1500-1800 calories per day in order to gain the weight loss as well as to maintain the ideal body weight.

b) Carbohydrates

Blood Glucose level depends on carbohydrate intake. 60-70% of total calories should be in the form of carbohydrates. The intake should be in accordance with physical activities. The simple carbohydrates such as sugar, sweets etc. should be avoided as they cause a sharp rise in blood glucose levels.

c) Fat

Only about 20-25% of total calories should be in the form of fats. There is a high risk of complications from coronary artery disease in diabetes. Therefore unsaturated fat should be used in place of saturated fats.

d) Proteins

Approximately 0.8 gm/kg of ideal body weight of protein i.e. 12-18% of total calories intake. This level of proteins should be adjusted in catabolic states such as pregnancy, lactation and in some elderly patients. Patients with neuropathy should restrict their protein intake to their recommended level.

e) Fibers

Fibers have two beneficial properties. One, it is physically bulky which increases satiety. Second, it delays the digestion as well as absorption of carbohydrates which minimizes the hyperglycemia. Recommended intake of fibers is 20-35 grams of fiber a day which should be increased gradually to avoid any discomfort. Fruits such as apple, orange and banana are good as they come to fiber whereas fruits containing high carbohydrate such as jackfruit should be avoided.

Small dietary tips for controlling diabetes:
- 4-5 small meal should be taken between some intervals instead of taking 3 full heavy meals.
- Fast foods and bakery foods should be replaced with whole cooked cereals.
- Carbohydrate intake should be avoided for 2 hours before going to bed.
- Fresh fruits and fresh vegetables should be consumed.
- Salt consumption should be restricted.

f) Exercise

Patient with diabetes should do some sort of exercise to gain physical and psychosocial benefits. Physical activity:

- Increases wellbeing.
- Stabilizes glucose levels.
- Improves blood pressure, Lipid Profile & hyper coagubility.
- Improves bone density.

Strenuous exercises should be avoided by patients of proliferative retinopathy as it may induce hemorrhage and resultant blindness. Patient should keep with themselves a quick source of carbohydrates to cope with the problem of hypoglycemia while exercising.

A. Alcohol intake

Alcohol if consumed in excess can cause hyperglycemia as it contains carbohydrates. It is advisable to stop consuming alcohol. Caution should be exercised while consuming alcohol as it interacts with some hypoglycemic drugs.

B. Smoking

The risk of cardiovascular problem is high in the people with diabetes of 40 years of age and who have high blood pressure. Infections, ulcers, gangrene and even amputation may be there because of smoking. There should be more emphasis on adopting various strategies for quitting smoking.

STATISTICAL ANALYSIS

Data were analyzed using Graph Pad Prism Version 6.00 and Microsoft Excel. The results were presented using absolute figures and percentages. Analysis was done by student's paired t test of significance.

RESULTS

TABLE: 1. GENDER DISTRIBUTION

Gender	No. of Patients	Percentage
Male	45	56.25
Female	35	43.75

A total of 80 patients were selected. Out of 80 patients 45(56.25%) were male and 35(43.75%) were female.

TABLE 2: AGE DISTRIBUTION

Age group in Years	Male	Female	Total
40-50	4	8	12
51-60	23	15	38
61-70	18	12	30

Out of 80 patients, 12 patients were between 40-50 years, 38 patients were between 51-60 years, 30 patients were between 61-70 years.

Table 3. Fasting Blood Glucose Levels

Parameters	Before patient counseling		After patient counseling	
	30 days	60 days	30 days	60 days
FBS (mg/dl)	148.40 ± 12.50	143.50 ± 11.50	131.50 ± 10.55	128.40 ± 80.05

Table 4. Body Mass Index

Parameters	Before patient counselling		After patient counselling	
	30 days	60 days	30 days	60 days
BMI (Kg/m^2)	23.84 ± 1.43 [a]	23.94 ± 1.44 [b]	23.80 ± 1.45 [a]	23.20 ± 1.49 [a]

Table 5. Systolic and Diastolic Blood Pressure

Parameters	Before patient counselling		After patient counselling	
	30 days	60 days	90 days	120 days
Systolic Blood Pressure(mmHg)	123.30 ± 3.27 [a]	121.50 ± 2.27 [b]	122.80 ± 3.01 [a]	124.20 ± 3.82 [a]
Diastolic Blood Pressure(mmHg)	80.20 ± 2.39 [a]	79.20 ± 1.69 [b]	80.20 ± 2.57 [a]	81.80 ± 2.20 [a]

DISCUSSION

In this study a total of 80 patients were selected. Out of 80 patients 45 (56.25%) were male and 35(43.75%) were female. The prevalence of diabetes is higher in women than men. But in this hospital male patients were more willing to come than female. Out of 80 patients, 12 patients were between 40-50 years, 38 patients were between 51-60 years, 30 patients were between 61-70 years. Age is one of the reason for the increasing the number of the patients. After the patient counseling the fasting glucose level, systolic and diastolic blood pressure level were decreased. The BMI also slightly decreased. The patients were followed the counseling points.

CONCLUSION

➢ Due to the patient counseling the Diabetes Mellitus patients were followed the diet control, daily exercise, quite alcohol and smoking. This is help to control of the blood glucose level, blood pressure, body mass index and lipids level.

➢ The patient counseling is essential for improvement of health status.

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