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Type II diabetes mellitus: A study of serum glucose levels in pre and post counselling.

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ABSTRACT

Background: Diabetes is a chronic disease caused by inherited and acquired deficiency in the production of insulin by the pancreas or decreased effectiveness of insulin. Gujarat is the second state after Tamil Nadu on the fast track in the number of incidences of diabetic patients.
Aim: To study the impact of nutritional counselling changes in the complications, symptoms and in the level of blood sugar in type 2 diabetes mellitus.

Study design: This is a prospective interventional study in type 2 diabetes mellitus subjects which were enrolled in Dhiraj Hospital based on the counselling

Materials and Methods: A prospective study on total of 107 subjects of T2DM. Subjects were counselled for their diseases condition to find out the awareness regarding symptoms and various complications.

Result: The fasting blood sugar and HBA1c was found to be highly significant in type 2 diabetes mellitus.

Conclusion: Three months of counselling significantly reduced the random blood sugar and also shown a decrease in symptoms and complications and reduced level indicated a physiologic fall with good metabolic control.

Keyword: Type 2 Diabetes Mellitus, fasting blood sugar and HBA1C

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INTRODUCTION:

Diabetes mellitus (DM) is a metabolic syndrome characterized by a deficit in insulin secretion or action resulting in hyperglycaemia [(1)]. This disease is caused by either deficient secretion of insulin by the pancreas or decreased action of insulin. One important component in the development of maturity onset diabetes mellitus is insulin resistance due to which blood sugar level increase leading disturbance in the homeostasis of glucose in the body.

According to the recent World Health Organization report (WHO), India today leads the world with over 32 million diabetic patients and this number is projected to increase to 79.4 million by the year 2030. [(2)] The incidence of type 2 DM varies substantially from one geographical region to the other as a result of environmental and lifestyle risk factors. [(3)] The worldwide prevalence of diabetes is 4% (1995) which will be 5.4% in 2025. [4] In India, thirty-five million people have diabetes, a number expected to be more than double by 2025, disproportionately affecting working-age people. The economic impact of this increase could be devastating to India's emerging economy. [(5)]

It is believed that patient's knowledge of self-care is the key in achieving therapeutic goals in ambulatory care. [6] With this background, the current study was planned with the objective assessing level of awareness regarding various aspects (Knowledge, Self-care practices and complications) of diabetes mellitus and to assess various factors affecting this level of awareness. [(7)]

This disease is associated with severe complications which affect patient's health, productivity, and quality of life. More than 50% of people with diabetes die of cardiovascular disease (CVD) (primarily heart disease and stroke) and is a sole cause of end stage renal disease which requires either dialysis or kidney transplantation. It is also a major cause of blindness due to retinal damage in adult age group referred to as diabetic retinopathy (DR), diabetic nephropathy (DN) and diabetic neuropathy (DN) [(8).]

HbA1c has been the key measure of glycemic control in diabetic patients. It is considered to be the gold standard marker, and most widely accepted test of glycemia among clinicians and patients [(9).]

Looking into the role of causation and progression diabetes and lacking in awareness regarding symptoms and complication in rural areas population. So, we have taken this study to see the impact of pre and post counselling stage and also check the association of glycemic control with hyperglycemia in the patients with type II diabetes mellitus.

MATERIAL AND METHODS:

The present study is a type of prospective study in the patients of type-II diabetes mellitus patients who visited into Medicine outdoor (OPD) at Dhiraj general Hospital Vadodara Gujarat and study was conducted on total 107 type-II diabetes mellitus patients after getting ethical clearance

The patients' general information regarding height, weight, and clinical assessment related with symptoms, complications were recorded for each and every T2DM patients as per constructed questionnaire.

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The diagnosed cases of type 2 diabetes mellitus with the age group of 40 to 75 years of either sex i.e. (Male & Female) have enrolled.

Patients of liver diseases, kidney diseases, type-1 diabetes, STD diseases and pregnant woman were excluded from the study.

All the patients were counselled regarding their awareness of disease including symptoms and complication after instructed time period i.e., 3 months. Blood sample were also analysed on pre and post counselling.

About 5 ml blood samples were collected from cases and controls & about 2ml was in fluoride vacutainer in order to get plasma for blood glucose and 3 ml in EDTA vacutainer for HbA1c at pre-counseling with following all the aseptic precautions. Fluoride vial was centrifuged at 3000 rpm for 10 minutes. And same procedure was followed at the post counseling stage.

The biochemical investigations include Blood Glucose was done on the EM-200 fully automated analyzer and Glycosylated haemoglobin (HbA1C) by High performance liquid chromatography (HPLC) at the central clinical laboratory of Dhiraj Hospital, Vadodara.

Data were statistically analyzed by 'SPSS, Version 16'. All the results were presented in the form of mean ± S.D. for the categorical data the data was presented in the form of frequency or percentage. A 'p' value of less than 0.05 was considered as statistically significant.

RESULTS

Figure-1: Age wise distribution of cases and controls

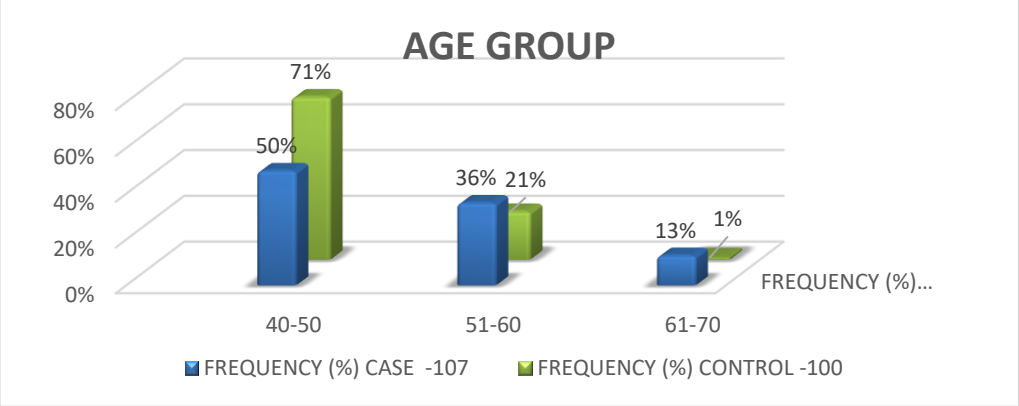

Table-2: Prevalence of symptoms-based risk for Pre-counsel case of diabetes mellitus

SYMPTOMS	FREQUENCY (%)
Excessive tiredness	20%
Excessive hunger	10%
Non healing wounds	13%
Excessive hunger	31%
Loss of vision	18%
Loss of sensation of hand and feet	13%
Passing excess urine	04%

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Table-3: Awareness of complications for Pre-counsel case of diabetes mellitus

COMPLICATIONS	AWARENESS	NOT AWARE
Retinopathy	00%	100%
Neuropathy	7%	92%
Nephropathy	00%	100%
Vascular	4%	95%

Table-4: Comparison of blood sugar levels between pre and post counselling case of Diabetes mellitus

BLOOD SUGAR LEVELS	PRECOUNSELLING (n=107)	POSTCOUNSELLING (n=107)	P VALUE
FBS (mg/dl)	192.97 ± 70.29	157.11 ± 43.06	0.0001
HBA1C (mg/dl)	7.72 ± 1.45	6.89 ± 0.92	0.0001

DISCUSSION

In India, there approximately 62 million people were affected by Diabetes Mellitus according to 2001 figure and it was expected to rise about 101 million by 2030[8]. Comparatively to rural population the prevalence of diabetes in urban condition is very high in India [9]. Gujarat is considered as one of the rich and developed state of India and Gujarat is having a second highest number of Diabetes Mellitus, after Tamil Nadu. Around 10% of the total population or Gujarat is found to be Diabetics [12]. A total 107 subjects were enrolled for this study, which was carried out in the Dhiraj Hospital section of SBKS of Sumandeep Vidyapeeth.

In the aspects of age wise distribution, the mean level of age was (51.9±7.03) and statistically significant (p value >0.0005). A total of four age groups were made with ten intervals that were: 40-50, 51-60 and 61-70. There were 50%, 36% and 13% in cases and 71%, 21% and 1% in their corresponding controls. The high frequency of type 2 diabetes mellitus subjects was found at the age group of 40-50. This is also presented in a chart form which has described above.

Vankudre et al (2013) carried out a study in Kancheepuram district of Tamil Nadu reported 50.4% of Diabetes Mellitus subjects to age group between 46 – 60 Years compared to our study the age group of study group was higher [13]. In another study, conducted by Tamaka et al (2010) in rural areas in Kolar district, where 54.8% of subjects belonged to 30- 40 years of age group which was much lower than that of age group observed in our study [14]

Singla et al (2017) reported that 58% had good knowledge about self-care practice and remaining 42% subject's knowledge was either average or good [14]. Our results are similar to Singla et al.

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(2017). these workers reported that 49.5% were aware about self-care system and 50% didn't aware about self-care practice. The self-care includes symptoms, habits etc. the symptoms of diabetes are like excessive tiredness, excessive hunger, non-healing wound, reduced vision, loss of sensation and passing of frequent excessive urine. So, regarding the manifestation of diabetes regarding symptoms, there were majority of subjects have excessive hunger (31%) & excessive tiredness (20%) and another manifestation including non-healing wound (13%) reduced vision (18%) loss of sensation (13%) and passing of frequent excessive urine were observed very less (4%), shown in **Table-2.** In the awareness regarding various complication of diabetes mellitus in rural population we found that majority of subjects were not aware about complication like Nephropathy and retinopathy whereas 7% were aware with neuropathy and 4% were Vascular complication. (Table no. 3). In our study in the subjects of pre-counselling stage, the mean levels of fasting blood sugar were 192.97±17.29 mg/dl compared to post-counselling 150.11±43.90 mg/dl. That indicate that there was a significant decrease in the levels of fasting blood sugar after counselling of 180 days. The mean level of HbA1c (7.72 ± 1.45) at pre counselling stage and the after the counseling the mean levels of HbA1c were significantly decrease (6.89 ± 0.92). Comparison of these two parameters between pre and post counselling stages, we observed statistically significant (P<0.0001) **Table-4.**

CONCLUSION:

- After the counselling the majority of patients came to know about various factors which play role in diabetes mellitus and that awareness was reflected in the improvement of complications. The awareness about diabetes mellitus helps to make the lifestyle changes and remain to be physically active.
- Many beneficial outcomes were resulted due to counselling process in which the participated subjects got knowledge regarding awareness of symptoms, complication of diseases.
- The effect of hyperglycemia likely to be reflected in the changes in levels of fasting blood serum and Glycosylated hemoglobin after the counselling of 180 days and this effect was seen in our observation as these are the predictor biomarkers for progression of diabetes mellitus.

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