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Factors affecting glycemic control among Diabetes Clients: A cross sectional survey

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ABSTRACT

Diabetes mellitus is a chronic heterogeneous metabolic disorder principally characterized by persistent hyperglycemia resulting from defects in insulin secretion and/or action. The purpose of the study was to identify the factors affecting glycemic control among patients with type 2 diabetes mellitus. The study used a quantitative approach and a descriptive research design. 200 subjects were selected using purposive sampling from medical and diabetology OPDs of SGMCH. Sociodemographic data, disease specific data, self-care, knowledge, attitude towards the disease, self-efficacy and family support were collected using questionnaire and BMI was calculated by assessing the height and weight. Data were tabulated and analyzed using descriptive and inferential statistics. The study showed that majority (77.5%) of the subjects was having poor glycemic control and 22.5% of the subjects were having good glycemic control. The study revealed that duration of the disease and treatment have significant association with glycemic control ($p<0.001$). The study also revealed that complications have a significant association with glycemic control ($p<0.05$).

KEYWORDS : diabetes mellitus, glycemic control, factors, cross sectional survey

Introduction

Diabetes mellitus is a chronic heterogenous metabolic disorder principally characterized by persistent hyperglycemia resulting from defects in insulin secretion and/or action. Type 2 diabetes mellitus, currently affecting 5-10% of most populations, has become the most frequently encountered metabolic disorder in the world; its prevalence is growing more rapidly among the developing nations due to rapid demographic and epidemiological transitions occurring in these countries as a consequence of urbanization, industrialization and globalization. According to International Diabetes Federation (2010) every year, over four million people die from diabetes, and tens and millions more suffer disabling and life-threatening complications such as heart attack, stroke, kidney failure, blindness and amputation. Over the next twenty years, Africa, Middle East and South-East Asia regions will shoulder the greatest increase in diabetes prevalence. No country, rich or poor, is immune to diabetes.

The term "diabetes mellitus" describes a metabolic disorder of multiple etiologies characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both. The effects of diabetes mellitus include long–term damage, dysfunction and failure of various organs (WHO 1999). Glycemic control is a medical term referring to the typical levels of blood sugar in a person with diabetes mellitus. Much evidence suggests that many of the long-term complications of diabetes, especially the microvascular complications, result from many years of hyperglycemia (elevated levels of glucose in the blood). Prevention, early identification and systematic follow up of treatment are the basic strategies for controlling the disease. In spite of well-defined treatment for type 2 diabetes, in majority of the people, disease is poorly controlled with existing therapies. Studies conducted in India regarding the factors affecting glycemic control are less. Hence it would be interesting to identify the factors associated with the control of diabetes.

Materials and Methods

In this study the researcher adopted a quantitative approach using a descriptive exploratory design. The setting of the study was diabetology and medical OPDs of Sree Gokulam Medical College and Hospital. The population of the study was patients diagnosed with type 2 diabetes mellitus. Subjects were patients diagnosed with type 2 diabetes mellitus visiting the medical and diabetology OPDs of SGMCH and those who satisfy the inclusion criteria. Sample size was 200 recruited using purposive sampling.

Tools and techniques

Tool 1 was the sociodemographic proforma. Tool 2 was the tool for assessing biological factors affecting glycemic control. It consisted of 3 sections. Section 1 included the anthropometric measurements. Section 2 was the disease specific data sheet. Section 3 was the summary of diabetes self-care activities. Tool 3 was the tool for assessing the psychological factors affecting glycemic control. It consisted of 3 sections i.e., diabetes knowledge test, diabetes attitude scale and the diabetes self-efficacy scale. Tool 4 included only 1 section about family support. It had questions to assess the frequency with which the family members of the patients with type 2 diabetes mellitus do certain things.

Data collection process

Formal permission was obtained from the institutional ethical committee of Sree Gokulam Nursing College and Research Foundation. The data was collected from 2-12-13 to 14-1-14. The subjects who attended the Medical and Diabetology OPDs of Sree Gokulam Medical College and Hospital and who met the inclusion criteria were identified and selected through purposive sampling method. After explaining the purposes of the study, informed consent was obtained from the subjects. Confidentiality of the subjects was maintained. After providing the needed description about the study, height of the subject was measured by using a standardized stadiometer and weight was measured by using a calibrated weighing machine and BMI was calculated. Glycemic control was assessed using HbA1c values which were obtained from the client's medical records. The value was selected only if he or she had done the test within the past 3 months. If the test was not done within the past 3 months, the researcher collected the blood sample and the test was performed. All the other data was collected using questionnaire. The data were collected daily from 8.00am to 4.00pm except on Sundays. 8-10 patients were interviewed per day on an average.

Results

30% of the subjects belonged to the age group of 61-65yrs and 2.5% of the subjects belonged to the age group of 30-35yrs. 52% of the subjects were females and 48% were males. More than half (56%) of the subjects were not holding any kind of job. Most of the subjects (57.5%) were having monthly income less than Rs.5000 and 4.5% of the subjects were having monthly income more than Rs.20, 000. Half of the subjects were overweight. 18% of the subjects were obese and 32% of the subjects were having BMI within normal limits. 33.5% of the subjects were having a recent diagnosis of diabetes

(1-3yrs). 27.5% of the subjects were diagnosed with diabetes for the past 4-6yrs and 14% of the subjects were diagnosed to have diabetes for the past 7-9yrs. 25% of the subjects were diagnosed with diabetes for 10years and more. 85.5% of the subjects were having atleast one or more of the co-morbidities (hypertension, dyslipidemia, thyroid disorders and CAD). More than half (54%) of the patients were solely on OHAs and 3% of the subjects were following dietary modifications only. 51.5% of the subjects were having atleast one or more of the micro vascular (diabetic neuropathy, nephropathy and retinopathy) and macro vascular complications (CAD, CVA). None of the subjects were having poor knowledge regarding the disease. 58% of the subjects were having moderate knowledge and 42% of the subjects were having good knowledge related to diabetes. None of the subjects were having negative attitude towards the disease. Majority (71%) of the subjects were having medium level of self-efficacy. 3.5% of the subjects were having low level of self-efficacy and 25.5% of the subjects were having high level of self-efficacy. Most of the subjects were having medium level of family support (75%) in managing the disease. 1.5% of the subjects were having low level of family support and 24% of the subjects were having high level of family support

Majority (77.5%) of the subjects was having poor glycemic control and only 22.5% of the subjects were having good glycemic control. There is a significant association between duration of the disease, type of treatment and glycemic control ($p<0.001$). There is a significant association between complications and glycemic control ($p<0.05$). There is no statistically significant association found between glycemic control and sociodemographic variables such as age, sex, religion, education occupation and monthly income.

Discussion

In the present study, 77.5% of the subjects with type 2 diabetes mellitus were having poor glycemic control. The findings are consistent with the findings of another study conducted in USA by Otiniano ME et al, which showed that 65.1% of the subjects were having poor glycemic control.

The present study revealed that there is a significant association between duration of the disease and poor glycemic control. The findings are consistent with the findings of another study conducted in China by Li-Nong Ji et al, which showed that glycemic control decreased with duration of type 2 diabetes mellitus. Similar findings were obtained in a longitudinal observational study on Predictors of glycemic control among patients with Type 2 diabetes among 573 patients in San Diego County conducted by Benoit SR et al, in 2005 which showed that patients who had diabetes for a longer period of time indicated poorer glycemic control. The younger subjects also had poorer control.

The study revealed that there is a significant association between complications of diabetes mellitus and glycemic control. The findings are consistent with another study on complications, co-morbidity, and blood glucose control in type 2 diabetes mellitus patients conducted in Germany by Liebl A et al, which showed that the complication status became considerably worse with increasing time since the diagnosis of diabetes and the mean HbA1c level was 7.51%.

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