Internal Medicine Section

Self Care Activities, Diabetic Distress and other Factors which Affected the Glycaemic Control in a Tertiary Care Teaching Hospital in South India

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ABSTRACT

Background: Interventions which were made to promote a better self-management have produced improvements in the glycaemic control in patients with Diabetes mellitus. An improved glycaemic control is known to prevent the long term complications.

Method: This study was conducted at the Dr. Pinnamaneni Siddhartha Institute of Medical Sciences and Research Foundation, which is a rural tertiary health care centre. 546 patients were included in our study and they were assessed for the glycaemic control (HbA1c), diabetes distress (DDs), and self care activities.

Results: Of the total 546 patients, 49% had a poor glycaemic control, as was indicated by HbA1c levels of >7%. The factors which are significantly associated with a poor glycaemic control are age (p=0.03), sex (p= 0.0415), literacy (p=0.0422), duration of the disease (p=0.0006), diabetic distress (p=0.0001) and self care activities like diet (p=0.0001), medication (p=0.0001) and exercise (p=0.0001), whereas there was no significant effect of the BM I (p=0.094) on the glycaemic control.

Conclusion: This study revealed the factors that could predict the glycaemic control in the diabetic patients who attended our tertiary care teaching hospital. The barriers that prevent these patients from meeting their goals must be explored, to improve their health outcomes.

INTRODUCTION

The patients with good diabetes self-care behaviours can attain an excellent glycaemic control [1]. Self care is highly challenging, since factors such as the patient's knowledge, physical skills and social and emotional factors, interact and affect the self care behaviour [2]. Although, frank depression and other psychiatric problems can manifest commonly in patients with diabetes, often high levels of diabetes-specific distress, may account for many of the reported findings. Diabetes distress is defined as the patient concerns about the disease management, support, emotional burden, and the access to care [3].

Studies have shown that lowering the HbA1C level to < 7% could reduce the microvascular complications if it was implemented immediately after the diagnosis of diabetes. It could thus reduce the long-term macrovascular disease [4]. Glycaemic control remains the major therapeutic objective for the prevention of target organ damage and other complications which arise due to diabetes [5]. Developing effective and efficient strategies to promote the self-management, is important for this process. This study was aimed at evaluating the self care practices, the distress which was caused by diabetes and other factors which affected the glycaemic control.

METHODS

This study was carried out at the Dr. Pinnamaneni Siddhartha Institute of Medical Sciences and Research Foundation (Dr.PSIMS

and RF), which is a tertiary care, teaching hospital with 780 beds, which extends health care facilities to the rural population.

The diabetic patients who attended the Department of Medicine during May 2012 to October 2012, were included in the study. 546 patients were recruited by a systematic random sampling, after obtaining their consents.

A standardized questionnaire which asked for the details which pertained to their sociodemographic profiles, anthropometry, urban /rural status, the family history of diabetes, the duration of diabetes and their occupation and literacy, was used. Their body mass index (BMI) was also recorded. The patients were assessed for their glycaemic control (HbA1c), their diabetes distress scales (DDS), and their self care activities.

Literacy, as was defined in the census operations, is the ability to read and write, with an understanding in any language [6].

Summary of the Diabetes Self –Care Activities Scale (SDSCA) [7]: This scale was developed by Toobert and Glasgow, it has acceptable reliability and validity. It contains 12 questions about the diet, exercises, blood sugar test, foot care and medication. The scale included the diabetes self care activities of the patients during the past 7 days. A score of less than three was considered as inadequate, while a score of more than three was considered as adequate (good self care).

The Diabetes Distress Scale (DDS17) yielded a total diabetes

distress scale score plus 4 sub scale scores, each of which addressed a different kind of distress. A mean item score of 3 or higher (moderate distress) was considered as a level of distress which was worthy of clinical attention [8].

STATISTICAL ANALYSIS

The statistical analysis was carried out by using the Graph Pad Prism, version 5.0. The data were described by using mean (S.D.) for the continuous variables and proportions for the categorical variables. The Chi-square test was used to assess the statistical significance of the difference in the percentages of the poor glycaemic control, according to the independent categorical variables. A p-value of <0.05 was considered as statistically significant.

ETHICS STATEMENT

The ethical committee of Dr. Pinnamaneni Siddhartha Institute of Medical Sciences and Research Foundation approved this study. Verbal consents were obtained from each respondent and the ethical committee approved the procedure, since the study was a survey, which would cause no any harm to the respondents.

RESULTS

The present study was a hospital based, cross sectional study which was conducted among the subjects who had type 2 diabetes, who attended our tertiary care hospital. This study mainly focused on the evaluation of the self care practices, diabetic distress and other factors which influenced the glycaemic control.

3.1. The participants' characteristics

This study included a total of 546 patients (303 men and 243 women) with Type 2 DM, who were aged between 24 and 84 years, with a mean age (S.D.) of 55.44 and the mean duration of diabetes being 6.14 years. Their clinical and relevant characteristics are shown in [Table/Fig-1]. About 56 % of the patients were on oral antidiabetic agents, 38% of the patients were on insulin alone and only 6 % of the patients were on a combination of oral antidiabetic agents and insulin. Among the diabetics, 47% were found to have a family history of diabetes. In our study, 61% were associated with the complications of diabetes, among which retinopathy (35%) had a higher prevalence, followed by coronary artery disease (12%).

3.2. The self-care management behaviours

59% of the patients were found to not follow their diabetic meal plans. About two thirds (63 %) of the patients were not taking adequate physical exercise. Only 31% patients practised proper foot care habits and those who had good adherence to their medications were 61% [Table/Fig-2].

It was observed that the patients who did not follow their diabetic meal plans, those who did not take adequate physical exercise and those who were not adherent to their medications, had a poor glycaemic control.

3.3. The diabetes distress scale

Of the 546 patients who were included in our study, 219 patients (40%) are found to have moderate distress. There was a statistically significant difference in the glycaemic control in the patients with a DDS value of >3 i.e.a poor glycaemic control was observed in 65.75% of the patients with a DDS value of >3 as compared to 38.53% patients with a DDS value of <3.

Characteristic	Number	(%)
Gender		
Female	243	44
Male	303	56
Age		
≤ 55	243	44
> 55	303	56
Education		
Illiterates	423	77
Literates	123	23
Family history of diabetes	258	47
BMI		
< 25	186	34
>25	360	66
Treatment		
Insulin	210	38
OAD	306	56
OAD, insulin	30	6
Complications of Diabetes		
Retinopathy	129	35
CAD	66	12
Nephropathy	30	5
Neuropathy	27	5
Peripheral Vascular disease	18	3
CVA	6	1

[Table/Fig-1]: Socio – demographic and clinical profile

SDSCA item	n (%)
1-Diet	
0-3 days inadequate	324(59%)
Male	303
>3-7 days adequate	222(41%)
2-Exercise	
0-3 days (inadequate)	344(63%)
>3-7 days (adequate)	202(37%)
3- Foot care	
0-3 days (inadequate)	376(69%)
>3-7 days (adequate)	170(31%)
4 – Medication	
<7days(inadequate)	216(39%)
7days(adequate)	330(61%)

[Table/Fig-2]: Summary of Diabetes Self–Care Activities Scale scores

3.4 The factors which affect the glycaemic control

Of the total 546 patients, 49% had a poor glycaemic control (HbA1c >7%). [Table/Fig-3] shows the proportion of the patients with a poor glycaemic control, according to the demographic and the clinical characteristics and the Self-care management behaviours. The factors which were observed to influence the glycaemic control were age (p=0.03), sex (p=0.0415), duration of diabetes (p=0.0006), literacy (p=0.0422), self care activities (diet, exercise, medication) p=0.0001 and distress (p=0.0001).

Variable		HbA1C< 7	HbA1c> 7	p- value
Age	< 55	132	111	0.03
	> 55	126	176	
Sex	Male	165	138	0.0415
	Female	111	132	
Duration of diabetes	< 6 years	201	159	0.0006
	> 6 years	75	111	
Education	Illiterate	231	192	0.0422
	Literate	45	78	
BMI	< 25	93	91	0.094
	>25	183	177	
DDS	< 3	201	126	0.0001
	>3	75	144	
Occupation	Heavy worker	96	81	
	Moderate worker	165	147	0.0005
	Sedentary worker	15	42	
Diet	< 3	200	124	0.0001
	> 3	102	120	
Medication	< 7	81	135	0.0001
	7	224	106	
Exercise	< 3	220	124	0.0001
	> 3	92	110	

[Table/Fig-3]: Significance of factors which effect glycemic control

DISCUSSION

In our study there was a significant difference in the glycaemic control between the two age groups (p-0.03). In a study which was conducted in Jordon [9] there was the lack of a correlation between age and a poor glycaemic control. A study which was done on sub Saharan patients showed that the levels of HbA1c were not influenced by age [10]. Since a majority of the elderly patients who participated in our study were illiterate and below the poverty line, they are dependent on their kith and kin for their health care, unlike the elderly patients in the developed countries, where elderly people have less stress and are post retirement pensioners.

According to our study, the gender difference was apparent and significant (0.0415) with respect to the glycaemic control, with a poor glycaemic control being observed more in females (54.3%) than in males (45.6%). The literature shows a mixed opinion on the gender determined glycaemic control in type 2 diabetes. Some reports [11,12] showed a gender inequality, while others [13,14] have indicated no difference between males and females.

On account of the social stigma against females, which is prevalent in the Indian sub continent and per se, in rural India, females have a lack of awareness on their disease and its complications, and are non adherent to their medication and other self care activities. These factors contribute to a poor glycaemic control among females.

In our study, 61 % of the patients were associated with the complications of diabetes, in which retinopathy (35%) had a higher prevalence, followed by coronary artery disease (12%). In the Chennai Urban Population Study (CUPS) [15], the prevalence of coronary artery disease was 21.4% and in a study which was conducted in Sankara Nethralaya [16], the prevalence of diabetic retinopathy in the population with diabetes mellitus was 18%.

Our study showed that a longer duration of diabetes was associated significantly with a poor glycaemic control (P value-0.0006). In a study which was conducted by Meena Verma et al, the results which were obtained, indicated that the HbA1c levels showed a significant increase with the duration of diabetes [17].

A longer duration of diabetes is known to be associated with a poor glycaemic control, possibly because of a progressive impairment of the insulin secretion with time, because of beta cell failure, which makes the response to the diet alone or the oral agents unlikely [18].

We found that a poor glycaemic control was more common among the patients who were non adherent to their medications, diet, and exercise. Therefore, the patients should be motivated to use the medications as are prescribed and a continuous education is recommended to encourage an adherence to physical activities and diet regimens.

Most of the patients with a clinically significant distress had a poor Glycaemic control (65.8%) and a statistically significant correlation was observed between the diabetic distress and the glycaemic control (P value-0.0001). In a study which was conducted by Lawrence Fischer et al., [19], a similar relationship was observed between the diabetes distress and the glycaemic control. In a similar study which compared the glycaemic control and the diabetic distress, the participants who experienced a decline in HbA1c of 0.8% over the 12 months, were found to experience a cumulative decline in the diabetic distress score of 5.4 [20].

CONCLUSION

This study revealed the factors that could predict the glycaemic control in the diabetic patients who attended our tertiary care teaching hospital. Though health care providers make significant contributions to the glycaemic control, there are social and cultural barriers that prevent these patients from meeting their goals. These barriers must be explored to improve their health outcomes. The patient attitudes and self-care ability through a behaviour change communication, may be useful tools for designing management strategies for the certain poorly controlled patients.

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