Original Article

Glycemic Control of Patients with Type II Diabetes at a Tertiary Care Hospital, Karachi

Fatima Zahra[1], Muhammad Athar Khan[2] and Rashid Naseem Khan[1]

ABSTRACT

Objective: Glycemic control of patients with type II diabetes at a tertiary care hospital, Karachi
Study Design: Cross Sectional Survey
Place and Duration of Study: This study was conducted at the Diabetic Clinics for T2DM patients at Darul Sehat Hospital, Karachi from June 2018 to December 2018.
Materials and Methods: A total of 217 T2DM patients aged ≥18 years were included in the study. Patients' demographic characteristics, self-care attitude, and compliance to medication were recorded. All available last readings for HbA1c were obtained from patients' records. The target value for different parameters were HbA1c <7%, FBS 80–130 mg/dL and RBS was <180 mg/dL respectively. Patients having HbA1c,FBS and RBS levels above the target levels were labeled with poor glycaemic control.
Results: In our study physical activity like exercise or walk frequently in a week was observed in 45% of patients whereas frequent SMBG was recorded in 44% of patients. Good glycemic control was recorded in 19% and poor glycemic control was seen in 81% of diabetic patients.
Conclusion: Majority of patients with type 2 diabetes mellitus at a tertiary care hospital. These study findings could be taken into consideration in future interventional studies aimed at improving glycemic control in these patients.

Key Words: Type 2 diabetes mellitus, complications, glycemic control, mortality

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INTRODUCTION

According to IDF, approximately 425 million adults (20-70 years) had diabetes in 2017; this level is expected to rise to 629 million by 2045.[1] In Pakistan, the prevalence of type 2 diabetes mellitus is 11.77%. In male the prevalence is 11.20 % and in females 9.19 % .[2] the main therapeutic goal in diabetes is glycemic control in order to prevent its complications. Multiple clinical trials have reported that strict glycemic control can lead to reduction of microvascular complications of diabetes.[3] A number of factors which may beresponsible for glycemic control, includes age, gender, body mass index (BMI), educational status, history of smoking, duration of the disease, and medication.[4]

Complications of type 2 diabetes mellitus can be worrisome due to its chronic nature and involvement of different organs.

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Patients with T2DM can develop complications like hypoglycaemia, hyperglycaemia, diabetic ketoacidosis, dehydration and thrombosis.[5]The condition is also associated with an economic burden and disability of employment for patient due to frequent doctor visits and recurrent hospitalization. Risk of diabetes increases with stress and dietary changes and the patients with physical inactivity, smoking, tobacco and alcohol consumption may also develop T2DM.[1,5-9]

In clinical practice, task of optimal control is a challenge for practitioners as well as patients to achieve on a long-term basis due to complex reasons of poor glycemic control in T2DM patients.[10] Diabetes-associated potential complications can be avoided by maintaining the good glycemic control.[11] Appropriate glycemic control and management is a fundamental key to either prevent or delay the progression of complications of diabetes. Failure to achieve glycemic control results in increasing burden of diabetes complications. However, less data is reported from Pakistan regarding factors for poor glycemic control and DM complications particularly in chronic T2DM .[12] This study may provide a baseline data for future studies regarding factors associated with poor glycemic control and DM complications among diabetic patients in Pakistan.[13] Therefore, the objective of this study was to assess the level of glycemic control among patients with type 2 diabetes mellitus (T2DM) attending at a tertiary care hospital of Karachi.

MATERIALS AND METHODS

The objective of this study was to assess the glycemic control of patients with type II diabetes at a tertiary care hospital, Karachi.

A cross-sectional study was done at the diabetic clinics for T2DM patients over a period of six months from 1st June 2018 to 30th December 2018. The patients taken for the study were T2DM patients aged less than 18 years. Study participants were recruited through consecutive sampling method. A total of 217 patients were included in the study after calculating the sample size using Open epi version assuming poor glycemic control observed in 83% of participants in study of Bukhsh et al.[14] A written informed consent was taken from all participants after explaining the study and their rights as participant. Patients' demographic characteristics, self-care attitude, and compliance to medication were recorded. All available last readings for HbA1c were obtained from patients' records. The target value for different parameters were HbA1c <7%, FBS 80–130 mg/dL and RBS was <180 mg/dL respectively. Patients having HbA1c, FBS and RBS levels above the target levels were labeled with poor glycaemic control.[15] Data were analyzed using Statistical Package for Social Sciences software, version 20. Data were described using means for continuous variables (age, duration of disease, HbA1c) and proportions for categorical variables (educational status, gender, occupation, and type of treatment). Associations between variables were tested by the use of the chi-square test (p value < 0.05 as significant).

RESULTS

A total of 217 patients participated among which 137(63.1%) were females and 80(36.9%) were males. A total of 126(58.1%) were housewives, 20(9.2%) businessman and 71(32.7%) others. Education status was 36% less than matric, 27% matric / inter, 22% graduate and 15 % masters.

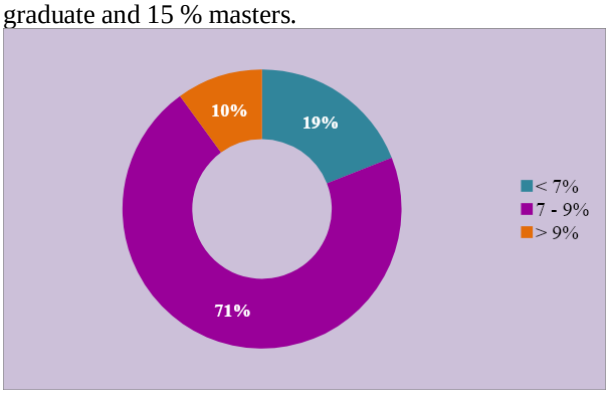

Figure No.1: HbA1c Levels of Patients

Table 1 show the duration of diabetes was more than 10 years in majority of our patients. According to our study oral hypoglycemic agents were the most common regime for type 2 diabetes patients. Physical activity like exercise or walk frequently in a week was observed in 45% of patients whereas frequent SMBG was recorded in 44% of patients. Family history of diabetes was found in 70% cases. According to the study 95 % patients were following the prescribed treatment and 65% patients had regular medical follow-ups. Good glycemic control was recorded in 19% and poor glycemic control was seen in 81% of diabetic patients.

Table No.1: Self-Care attitude of diabetic patient

Questions	Percentage
1. Duration of diabetes?	
A. Less than 5 years	32%
B.5 to 10 years	31%
C. More than 10 years	37%
2. What is your current treatment of diabetes?	
A. Oral hypoglycemic drugs	62%
B. Insulin	21%
C. Oral hypoglycemic drugs plus Insulin	17%
3. Family history of diabetes in first degree relatives?	70%
Yes	
4.Exercise or walk:	
A. Most days of week	45%
B.2 to 3 times a week	9%
C. Once a week	9%
D. Few times a month	8%
E. Never	29%
5.Monitoring blood glucose	
A.2 to 3 times/week	44%
B.Once a week	16%
C.Few days a month	23%
D.Don't bother to check until symptomatic	16%
6. Do you smoke? (Yes)	11%
7. Have you ever been hospitalized for your diabetes?	30%
Yes	
8. Do you make your own modification in the dose of drugs prescribed?	12%
Yes	
9. **Do you carry food like sweet drinks, candy or chocolate just incase of hypoglycemia?**	33%
Yes	
10.Visit doctor at :	
A.1-3 months	61%
B.3-6 months	21%
C. Annually	9%
D. No regular follow-ups	9%
11. Do you take treatment as prescribed to you?	95%
Yes	

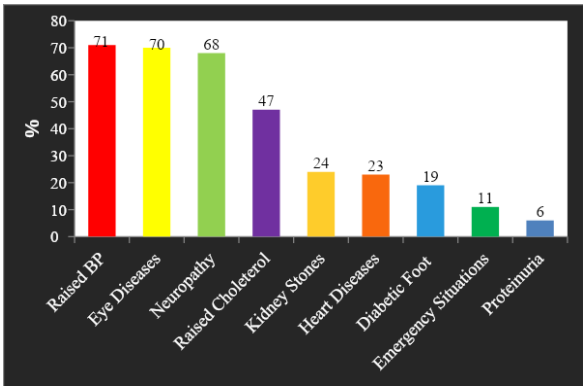

Figure No.2: Complications in Patients with Type II DM

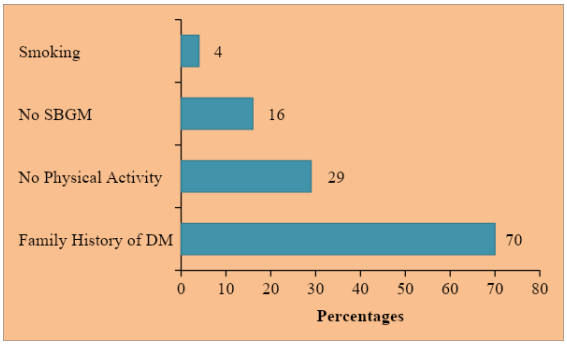

Figure No.3: Factors Related with Poor Glycemic Control

DISCUSSION

United Kingdom Prospective Diabetes Study (UKPDS) study has observed that strict glycemic control can prevent death due to diabetes-related complications. UKPDS reported that microvascular and macrovascular complications can be reduced by 12-43% after reducing HbA1c by 1 %.[16] Current guidelines recommend target HbA1c of <6.5% for good glycemic control.[17] The good glycemic control in diabetes is considered as patients having HbA1c <7 % which reduces the chances of hypoglycemia . The choice of treatment regime in order to maintain the good glycemic control is very challenging.[18] In our study, poor glycemic control was seen in 81% of patients mostly with HbA1c of 7- 9% whereas10% have HbA1c more than 9.Moreover majority 62% of our patients were receiving OHA despite being the duration of diabetes more than 5 years.

It was reported previously in many studies that factors including self-monitoring of blood glucose, dietary habits, physical activities and medications may affect glycemic control.[19] In one of the study, 83% of patients had poor glycemic control comparable to our 81% such patients and management of diabetes was found as the strongest predictor of glycemic control along with dietary habits and physical activity.[20,21] Routine activities and lifestyle affects health outcomes of diabetes and many studies found clinically significant association between glycemic control and self-care activities.[14,22] We observed that 16% of the patients didn't check their blood glucose and it was also observed that despite being aware of significant effect of physical activities on glycemic control 29% of patients don't have any routine physical activity.

An international study of Malaysia, conducted on 438 patients in private clinics with T2DM, reported that approximately 20% of patients had HbA1c levels of <7%. Studies conducted in public primary health care centers observed that 28.8% of diabetic patients had a HbA1c level <7.5%, while 61.1% had HbA1c of more than 8%.[23] The study carried out in Jordan also found poor glycemic control in 65.1% of patients with a longer duration of the disease and they were non complaint had poorly controlled HbA1c levels of more than 7%.[24,25] In our study, we observed good glycemic control (HbA1c <7) in 19% of patients which was very low. The contributing factors can be less frequent SMBG and non-adherence to medical checkups. We found that some (44%) of patients were checking their blood glucose 2-3 times in a week and physical activity was also observed in 45 % patients.

A study from Malaysia reported that 23.3 % female and 22.4% male have good glycemic control which was found to be affected by age, duration of diabetes mellitus, and drug utilization pattern, whereas diet and non-smoking, were not associated with good glycemic control. Moreover it was observed that good glycemic control was not associated with self-management behavior. Moreover, better glycemic control was seen in Older patients with a shorter duration of diabetes and their treatment included monotherapy.[26] Despite the evident benefits of strict glycemic control, 60% of patients failed to achieve the recommended target of glycemic control.[25,27] There is a considerable variability with regard to attainment of HbA1c goal of <7% among the different classes of diabetes medications; baseline HbA1c is an important determinant of observed efficacy.[28]

CONCLUSION

In our study, it was concluded that 81% of patients with type 2 diabetes mellitus at a tertiary care hospital have poor glycemic control and these study findings could be taken into consideration in future interventional studies aimed at improving glycemic control in these patients.

Author's Contribution:

Concept & Design of Study:	Fatima Zahra, Rashid Naseem Khan
Drafting:	Muhammad Athar Khan
Data Analysis:	Muhammad Athar Khan
Revisiting Critically:	Muhammad Athar Khan, Fatima Zahra, Rashid Naseem Khan
Final Approval of version:	Muhammad Athar Khan,

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Acknowledgement: Data collection and entry was done by TahreemIrfan, Adina Safi, Mehak Ahmed;
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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