Awareness of Diabetes Mellitus and Glycemic control amongst patients with Type 2 Diabetes

Ujwal L Yeole[1], Mariya P Jiandani[2], Hashmeet Kaur Bakshi[3], Shailaja Kale[4]

[1]Associate Professor and Principal, Department of Physiotherapy, Tilak Maharashtra Vidyapeeth, Pune, [2]Associate Professor, PT School and Center, Seth GS Medical College and KEM Hospital, Parel, Mumbai, [3]Student 4th year BPT, Department of Physiotherapy, Tilak Maharashtra Vidyapeeth, Pune, [4]Consultant Diabetologist, Dr. Shailaja Kale's Diabetes and Speciality Clinics, Pune

Abstract

Background: The patient's awareness about diabetes, its complications, role of lifestyle modifications can establish patient specific goals. This study was done to determine the level of awareness regarding Diabetes mellitus, its complications and Glycemic control.

Methods: A survey was carried out on 245 diabetic patients visiting Medicine OPDs at affiliated hospitals in Pune to determine the level of awareness of Diabetes Mellitus and Glycemic control amongst patients with Type 2 Diabetes. A predesigned and validated questionnaire was administered which was further modified post pilot study.

Results: Total 200 patients with mean age of 53±6.66 years (84 males and 116 females), mean duration of diabetes 8.20±8.057 years and mean HbA1C 7.11±0.95 % were interviewed for the level of awareness of Diabetes Mellitus and Glycemic control. Around 62% people perceived diabetes to be a life lasting disorder whereas 24% considered it to be a life threatening and a non-treatable disorder. Almost 77% completely agreed that Glycemic control is important with 71% completely agreed that daily exercise with a particular exercise regime and lifestyle modification proves advantageous. Around 63% completely agreed that a proper diet plan should be followed by diabetics and they should not skip meals.

Conclusion: Majority of diabetes patients had awareness about diabetes, its complications, role of exercises and diet in glycemic control.

Key words: *Awareness, Glycemic control, Type 2 Diabetes, Exercise, Diet, Lifestyle Modification.*

Introduction

Diabetes mellitus is a complex, chronic illness which requires continuous medical care along with multifactorial risk reduction strategies beyond glycemic control.[1] Diabetes mellitus (DM) has emerged as a major public health challenge around the world. The greatest burden of diabetes mellitus has been faced by the low and middle income countries. With rapid economic development, elevated standard of living, dietary shifts, lifestyle alterations, and aging , diabetes mellitus has become an important public health problem worldwide. It is estimated to be the third most challenging disease threatening public health after malignant tumors and cardiocerebral vascular diseases.[2]

In 2011 the Diabetes Atlas of the International Diabetes Federation (IDF) estimated the global DM prevalence in the age group 20–79 years at 8.3%, which translates into 366.2 million people suffering from DM in 2011. By 2030, the number of people living with diabetes mellitus is projected to reach 551.9 million.[3] Recent global study stated that 60% of diabetics worldwide come from Asia because it is the world's most populous region.[4]

Excessive caloric intake and physical inactivity are well recognised environmental factors which predispose type 2 diabetes. Obesity and sedentary lifestyle are risk factors that play important roles in escalating the prevalence of developing Type 2 diabetes mellitus. In

both men and women , increased physical activity is associated with a reduced risk of diabetes and even a moderate activity is protective against Type 2 diabetes mellitus.[3]

By creating awareness amongst patients about diabetes, its complications, medication, lifestyle modification and diet plan patient specific goals like effectiveness of medication and decrease in likelihood of adverse events in diabetic patients can be established.[1] The management of diabetes mellitus largely depends on the affected person's ability to pursue self-care in daily living. The awareness, treatment and control of diabetes mellitus can effectively reflect on the social status of diabetes conditions.[2]

As lack of awareness about diabetes and inadequate control of glycemia are among the major factors for the prevalence of diabetes; this study was carried out with an objective of creating the awareness among the diabetic population to ensure better management , better prognosis and prevention of complications in the diabetic population.

Method

This study was carried out as a part of screening phase of a research project registered under [CTRI/2018/01/011193] approved by institutional ethical committee with the approval number: [IEC II/338/18].

An Exploratory cross sectional survey was carried out on diabetic patients visiting Medicine OPDs at affiliated hospitals in Pune to determine the level of awareness of Diabetes Mellitus and Glycemic control amongst patients with Type 2 Diabetes. Patients visiting diabetic clinics were approached (total 245) amongst which 228 agreed for participation in the survey.

The patients within age of 35-60 years, both male and females and patients diagnosed with Type 2 diabetes since more than one year were included in the study and patients with Type 1 and gestational diabetes were excluded from the study. Total 28 patients did not fit in the criteria so were excluded. A final survey was carried out on 200 diabetic individuals. The patients who agreed for participation in the survey were further interviewed using a predesigned questionnaire by trained interviewer.

Experts in the field were consulted and a predesigned questionnaire was administered which was further modified post pilot study. Prior to participation patients were instructed and explained about the aims, objectives, method of study and informed Consent was obtained from the participants.

The questionnaire was categorized into two components. The first component of the questionnaire included questions evaluating awareness regarding Diabetes Mellitus as a condition and its complications, in which they were given the flexibility to respond more than one option based on their diabetic knowledge about the condition. The second component included questions evaluating awareness regarding Glycemic control where the patients had to choose only one option on Likert scale. The patients were interviewed and the results were formulated.

Data management and statistical analysis:

The collected data was tabulated and analysed using Microsoft Excel 2010 and InStat [DATASET1.ISD] software.

Results

Total 200 patients with mean age of 53±6.66 years (84 males and 116 females) were interviewed for the level of awareness of Diabetes Mellitus and Glycemic control. The average BMI was 26.11±5.66 kg/m^2 in males and 26.6±5.26 kg/m^2 in females. The mean duration of diabetes of the males was 9.88±9.56 years and that of females was 7.077±6.31 years. The mean HbA1C of the male patients was 7.35±1.047 % and those of the female patients was 6.98±1.37%. Table 1 depicts component evaluating awareness regarding Glycemic control.

Discussion

Diabetes mellitus is a metabolic disorder of multiple aetiology characterized by chronic hyperglycemia with disturbances of carbohydrates, fats and protein metabolism resulting from defects in insulin secretion, insulin action or both.[3] The causes of Type 2 diabetes are central adiposity, lack of physical activity and excessive caloric intake, mental stress and genetic susceptibility [3]. In this study around 58% patients said the cause of Type 2 diabetes is mental stress whereas very few said it is due to eating lots of sugar and other factors like excessive bodyweight and genetic inheritance.

There are multiple misconcepts regarding Diabetes as a condition, its causes, the methods for achieving good glycemic control. In this study around 62% of

the diabetic patients perceived diabetes as a life lasting disorder and 24% mentioned it as a non treatable and a life threatening condition. Almost 67% said that insulin helps to control glycemic levels. [3] In this study it was seen that 77% completely agreed that glycemic control is important. Only 29% were aware that no dietary modifications are required with insulin is a misconception. Ali Reza Soltanian et al in their study concluded that lack of awareness can lead to development of diabetes and increase the cost of treatment.[5]

There are various concepts regarding insulin administration, the site of it's administration and also about target blood sugar levels. This study showed hardly 50% of the people were aware about Target BSL for good glycemic control. 51% were aware that insulin should be administrated on the proper body sites but only 30% mentioned that the site should be changed at regular intervals.

While evaluating the knowledge about symptoms of hypoglycaemia and hyperglycaemia it was observed that majority of the patients were aware of symptoms of hypoglycaemia and measures to be adopted for its management. Symptoms of hypoglycaemia include palpitation, sweating, nausea, hunger, headache, fatigue, mental dullness, blurring or clouding of vision and unconsciousness .[3] This study states that 63% were aware that the symptoms of reduced BSL is weakness/ fatigue but only 24% were aware that light headedness is also a symptom of hypoglycaemia and the method of managing it is eating sweets/chocolates was known by 72% of the people but only 18% knew that eating food is also a method of managing it. The clinical features of increased blood sugar levels include polyphagia, polydipsia, polyuria, unexplained weight loss despite of normal appetite, recurrent bacterial infections, recurrent urinary tract infections [6]. In this study , 66% people were aware that the symptom of increased BSL is increased thirst but only 20% were aware that loss of weight despite of normal appetite is also a symptom.

There are studies which stated that the complications of Type 2 diabetes include Ischaemic Heart Disease, Renal failure, Stroke, Heart failure, Peripheral neuropathy, Foot Ulcers, Retinopathy, Myocardial infarction, Major amputations .[2] A study stated that Type 2 diabetes have autonomic symptoms and may further result into autonomic dysfunctions due to damage to autonomic nerve fibres that result in abnormalities in HR control and vascular dynamics that is commonly seen disease like DM.[7] In this study there were only 20% who were aware of the fact that uncontrolled diabetes leads to peripheral neuropathy as a complication whereas more than 50% people were aware that renal failure, cardiovascular problems and retinopathy can also be caused due to uncontrolled diabetes. The major contributory factors for the high prevalence of diabetes and its complications are inadequate control of glycaemia , hypertension , delayed diagnosis of diabetes and lack of awareness about diabetes among the majority of the public.[3]

Physical activity is considered to be an important component of weight management programme. Regular exercise and aerobic fitness improve insulin sensitivity and glycemic control, decrease the risk of developing diabetes and reduces overall mortality in patients with Type 2 Diabetes.

This study states that 63% completely agreed that a proper diet plan should be followed by diabetics and they should not skip meals when busy. Which is in review with the study stated done by Sylria Hhey and Osama Homdy that diet rich in wholegrains, fruits, vegetables, legumes, with moderate in alcohol consumption and low in refined grains, red meat and sugar sweetened beverages have been shown to reduce risk of diabetes and improve glycemic control in patients with diabetes.[8]

A cornerstone of diabetes management is formed by life-style modification which involves giving up of certain pleasures of unhealthy life-styles which include lack of physical activity and irregular eating in order to prevent and / or delay diabetic complications and to achieve a desirable glycemic control.[3] In this study, 71% completely agreed that there are various advantages of daily exercise and lifestyle modification in diabetes. 69% completely agreed that a particular exercise regime should be followed by diabetics 5 days a week for at least 30 minutes. Previous studies that stated the incidence of diabetes is reduced by lifestyle intervention and also that lifestyle interventions are particularly effective to delay or prevent the development of complications substantially reducing the individual and public health burden of diabetes. It also mentioned that lifestyle interventions were more effective than metformin.[8]

Most of participants (65%) completely agreed importance of routine follow up with physician better diabetes management. 79% completely agreed that diabetes medicines should be taken regularly as given by physician. R. Brian Haynes, et al in their study

stated low adherence to prescribed medical regimens is a ubiquitous problem. To reap the benefits of medical therapies, better, more effective, and more efficient interventions for helping people to follow regimens are needed.[9]

Effective diabetes mellitus education, with consequent improvements in knowledge, attitudes and skills, leads to better control of the disease, and is widely accepted to be an integral part of comprehensive diabetes mellitus care and management.[7] During the period of undiagnosed diabetes, risks for micro- and macrovascular complications are elevated and it has been proposed that treating hyperglycemia to prevent complications is more effective than treating these complications after they have developed.[10]

The data collected empirically shows that the level of awareness of patients about diabetes, its complications and management in the diabetic population in Pune in India was good. There are multiple misconcepts regarding Diabetes as a condition, its causes, knowledge about symptoms of hypoglycaemia and hyperglycaemia, the methods for achieving good glycemic control.

This study evaluated the awareness of diabetes knowledge and glycemic control.

The level of literacy of the patients, also may impact the Glycemic control in Diabetic patients. Future studies can be done to evaluate the association of

Further study can be done to compare the awareness between type 1 and type 2 patients and also a comparison study of awareness between patients in rural and urban populations can be done.

Conclusion

Majority of diabetes patients are well aware about diabetes, the possible complications of diabetes and the role of exercises and diet control in glycemic control.

Acknowledgement: The authors would like to acknowledge Dr Shreepad Bhat, Diabetologist at Affiliated Hospital for his kind support throughout conducting this survey.

Financial Support and sponsorships: NIL

Conflicts of Interest: There are no conflicts of interests.

TABLE 1: Component evaluating awareness regarding Glycemic control

	Completely disagree	Somewhat disagree	Neither agree nor disagree	Somewhat Agree	Completely agree
1. Daily exercise and lifestyle modifications is beneficial.	0%	02%	05%	22%	71%
2. A particular exercise regime should be followed.	0%	02%	03%	26%	69%
3. Follow up with your physician even in absence of any fresh complain is important.	04%	01%	05%	21%	69%
4. Diabetes Medicines should be taken regularly.	0%	01%	02%	18%	79%
5.Diabetes medicine can be stopped after feeling better.	59%	09%	07%	09%	21%
6.Glycemic control is important	02%	01%	05%	15%	77%
7. Regular BSL checkup is important for Glycemic control	03%	03%	07%	26%	61%
8. Should have a proper diet plan, a Dietician should be consulted	0%	03%	06%	28%	63%
9.Diabetics should not skip meals	11%	03%	05%	18%	63%
10.Diabetics cannot eat fruits.	53%	15%	09%	12%	11%

References

1. Rahman UZ, Irshad M, Khan I, Khan AF, Baig A, Gaohar QY. A survey of awareness regarding diabetes and its management among patients with diabetes in Peshawar, Pakistan. J Post Med Inst 2014; 28(4): 372-7.
2. Wang C, Yu Y, Zhang X, Li Y, Kou C, Li B, et al. Awareness, Treatment, Control of Diabetes Mellitus and the Risk Factors: Survey Results from Northeast China. PLoS ONE 2014; 9(7):e103594.
3. Munjal Y, Sharma SK. API Textbook of Medicine, Tenth edition, Jaypee Brothers 2015:457-42.
4. Deepa M, Bhansali A, Anjana RM, Pradeepa R, Joshi SR, Joshi PP, et al. Knowledge and awareness of diabetes in urban and rural India: The Indian Council of Medical Research India Diabetes Study (Phase I): Indian Council of Medical Research India Diabetes 4. Indian J Endocrinol Metab 2018, 18(3): 379-85.
5. Knowler WC, Barrett-Connor E, Fowler SE, Hamman RF, Lachin JM, Walker EA, et al. Reduction in incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med 2002, 346:393-03.
6. Pawar P, Yeole U, Ruparel D, Panse R, Gharote G, Kulkarni, S. Effect of inspiratory muscle training on autonomic symptoms in patients with type 2 diabetes. IJAMSCR 2018. 6(4).
7. Ley SH, Hamdy O, Mohan V, Frank BH. Prevention and management of type 2 diabetes: dietary components and nutritional strategies, The Lancet 2014; 383.
8. Haynes, R.B., Heather, P., Amit, X.G.Helping Patients follow up prescribes treatment", Journal of the American Medical Association 2002; 2880-83.
9. Alonso-Moran E, Oreuta JF, Esteban FIJ, Axpe JMA, Gonzalez MLM, Polanco NT, et al. The prevalence of diabetes-related complications and multimorbidity in the population with type 2 diabetes mellitus in the Basque Country, BMC Public Health 2014; 14:1059.