Haemoglobin Glycosilate as a Glycemic Control at Type 2 Diabetes Mellitus Patients

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Abstract: Chronic disease that characterized by blood glucose levels that exceed normal values is Diabetes Mellitus. The patient of type 2 diabetes mellitus must controlled their bood sugar level and the most accurate way to determine blood sugar levels over the past to three months by Hba1c measurement.This study was to determine the levels of blood sugar and Hba1c in patients with type 2 diabetes mellitus in Johor Primary Health Care (PHC) in Medan of Sumatera Utara, Indonesia. This study used cross-sectional design conducted in Johor PHC, Medan of Sumatera Utara, 40 patients with type 2 diabetes mellitus. All the samples of fasting blood sugar and HbA1c were recorded for each patient who attend to the PHC . We collected the primary data through interviews, physical examination and laboratory test. More than half of the samples of this study have bad Hba1c levels (>8%) cause of many patients   of type 2 diabetes mellitus lack of knowledge about the correct management of diabetes mellitus.

1   INTRODUCTION

One of the public health problem and a major clinical is Diabetes mellitus, taht requires continuing medical care and ingoing patient management education and support to prevent acute complication and to reduce the risk long-term complication. All over the world the precalence of type 2 diabetes mellitus id rapidly increasing. In 2011, the global prevalence of diabetes was 366 million and caused 4.6 million deaths (IDF). This figure is expected to rise to 522 million by 2030 and will be 7th leading cause of death in 2030 (IDF 2012, WHO 2011). Indonesia is the world's fourth most populated country, has the seventh largest number of diabetic patients(7.6 million), despite relatively low prevalence (4,8% including both diabetes type 1 and 2 in individuals aged 20-79 years) in 2012 (IDF, 2012). Because of its high morbidity and mortality diabetes mellitus is an important health problem (King H et al, 1998), Indonesia is the country with the largest numbers of people with diabetes (Shaw JE,2010, Wild et al, 2004). In urban Indonesia of the prevalence of diabetes mellitus is 5.7% (Mihardja L et al, 2009), and a younger age of the incidence of diabetes mellitus is starting to rise (Chan JC et al, 2009).

According American Diabetis Association(ADA) glycemic control as one of the important strategies for the management of DM and glycosylated haemoglobin (Hbalc) is the best measure of glycemic level over the previous 3 months. Hbalc is udes to monitor diabetic treatment each 3 months once because of the erythrocyte haemoglobinglycation since erythrocytes have about 120 days life span, and reflects overall blood glucose levels over a period 2-3 months and further, in the achievement of the best possible glycemic control it has been recognized that hbalc as an essential adjunct to regular self-blood glucose measurement assisting (Saudek CD et al, 2009). The health of individuals and communities depended many factors which was influenced. The low education level is one of these factors which is linked poor health, more stress and lower self-confidence. This aim of study to determine the levels of Hbalc in patients with type 2 diabetes mellitus in Johor PHC in Medan of North Sumatera, Indonesia.

2   MATERIAL AND METHODS

Patients were recruited from Medan Johor Primary Health Care (PHC),North Sumatera, Indonesia.This

was conducted from April to June 2018. We take 40 samples from this PHC. In appropriate with the inclusion criteria which are both of sex (female,male), aged > 40 years old, cooperative and gave the signature for will join this research and exclusion criteria which are, have the ability to read. All participants gave written, informed concent to participate in the study. This research was approved by Health Research Ethical Committee, Medical Faculty of University Sumatera Utara /H.Adam Malik General Hospital by number 591/TGL/KEPK FK USU-RSUP HAM /2017. Before starting education activities, each sample we examine weight, height, waist size, blood pressure, and laboratory tests such as fasting blood sugar levels (FBS) and Hba1c. Fasting blood sugar of samples we examined by using portable measuring instrument (Gluco DR). Blood samples were collected (using syringe) twice before and after intervention by education and transferred to Pramita clinic laboratory immediately to be conducted glycosilated haemoglobin test by HPLC method.

According to the American Diabetes Association (ADA), a diagnosis of diabetes can be established in the presence of any of the following (two tests are required) : 1) fasting plasma glucose levels of ≥ 126 mg/dL ; 2) random plasma glucose ≥ 200mg/dL in a patients with classic symptoms of hyperglycemia ; 3) 2-h plasma glucose level ≥ 200 mg/dL during a 75 g oral glucose tolerance test; 4) Hba1c level of $\geq 6.5\%$ (Diabetes Care.2015).

The participants completed a general information from included question on age, marital status,family history of the disease,duration of the disease, clinical characteristics, awareness of diabetic complications, taking oral diabetic or insulin injection, smoking, following any diet, daily activity, education level and job.

3 RESULTS

The number of the samples from the Johor PHC were comprised of female were people (30) and men were people (10). Mean age of the samples were 62.53±7.809 years old. Hba1c value of the samples >8% were 67.5% (27) people and Hba1c value 6-8% were 32.5% (13) people of the samples.The demographic data; gender, age-group, education level, family history and type of treatment . See the table 1 on the bellow.

Table 1: Charactheristic of the Participants.

Characteristic	N	%
Gender		
Male	10	25%
Female	30	75%
Mean Age	62.53±7.809	
Education Level		
Junior High School	10	9%
Senior High School	23	20.7%
Academy/University	10	6.3%
Physical activity		
insufficient	28	70%
sufficient	12	30%
Duration of disease		
<3 years	18	45%
3-6 years	3	7.5%
>6 years	3	7.5%
Familial History		
Mathernal	8	20%
Fathernal	3	7.5%
Mahernal and Fathernal	4	10%
none	25	62.5%
Medications		
OAD	34	85%
OAD+insulin	6	15%

Table 2: Hba1c Value.

Hba1c(%)	Frequency	Percentace(%)
6.5-8	17	42.5
>8	23	57.5

Table 3: BMI FBS and Hba1c result.

	Min	Max	Mean	SD
BMI(kg/m²)	18.57	32.46	25.54	3.39
FBS(mg/dL)	143	500	202.20	81.68
Hba1c(%)	6.1	14	8.65	1.75

Among study (n=40)

4 DISCUSSION

The result of this study from the 40 respondents among the type 2 diabetes mellitus patients showed that more than half of the samples Hbac1 value > 8%, it means more than half of the samples were cathegoryzed as uncontrolled diabetes mellitus patients. Rusdiana et al published at Advanced Science Letter 2017 showed that most of the type 2 DM patients in PHC in Binjai Hba1c value >8% at type 2 diabetes mellitus. And research by Rusdiana et al published at OAMJM showed that by education management for three months can reduced Hba1c value, it means for the type 2 diabetes mellitus needed to increasing their knowledge for diabetes mellitus. The other research by Rina Amelia about analysis of

factors affecting the self-care behaviors of diabetes mellitus type 2 patients in Binjai, North Sumatera – Indonesia showed that self-care behaviors of type 2 diabetes mellitus in Binjai are significantly influenced by motivation, self – efficacy, communication,knowledge, and attitude.

5 CONCLUSIONS

Because of more than half of this samples Hba1c value >8% so this samples needed education about the management of diabetes mellitus in order the type 2 diabetes mellitus get the a good understanding about diabetes mellitus.

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