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Differences in Characteristics of Type 2 Diabetes Mellitus Patients Between Those Who Have Complications and Those Who Do Not Have Complications

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***Abstract*—Objectives: The purpose of this study was to determine differences in the characteristics of type 2 Diabetes Mellitus (DM) patients between those who have complications and those who do not have complications. Method: Participants in this study were type 2 DM patients (n = 41). Member of Prolanis South Cilacap Community Health Center. Participation were selected using total sampling techniques. Results and Discussion: There was no difference in age, sex, the duration of DM, BMI, sex, type of DM medication and the major complaints in type 2 diabetes patients between those who had complications and those who did not have complications. Conclusion: DM complications can not be predicted from the characteristics of patients. So that the prevention of complications should be done as early as possible when the patient is first diagnosed with DM, through the provision of health education and empower patients to adhere with DM treatment.**

Keywords: characteristics, type 2 diabetes mellitus, complications

I. INTRODUCTION

Indonesia is ranked 6th in the world with 10.3 million people with DM. It is estimated that the number will increase to reach 16,7 million people in 2045 [1]. The condition of chronic hyperglycemia can be a trigger of various serious complications in type 2 DM patients. Complications of DM are categorized as serious because it can lead the other chronic diseases that are dangerous [2].

Research results show that more than 50% DM patients experience complications. There are 5 major complications of DM, namely kidney failure, pneumonia, diabetic foot injuries, heart failure and hypertension [3]. Result of other studies indicate that it is a common complication of neuropathy, hypertension, retinopathy, heart failure, kidney failure and stroke [4].

Managing complications in type 2 DM patients become an urgent problem that must be done. To manage complications of type 2 DM patients properly epidemiological data on complications of type 2 DM patients are needed to estimate more rational and effective prevention and management planning. Data about complications of type 2 DM in Cilacap district is still difficult to find. Therefore, research of complications of type 2 DM patients is considered necessary to provide data for health practitioners.

II. MATERIAL AND METHOD

A. Procedure

The study was conducted at the South Cilacap Health Center 2. At the time of data collection, the number of respondentd obtained was 41 people, of which 21 people had complications and 20 people did not have complications. Data were collected using a questionnaire about the characteristics of type 2 DM patients consisting of age, sex, BMT, duration of DM, type of DM medication, major complaint and type of DM complications.

B. Data Analysis

Bivariate data analysis uses 2 type of statistical tests, namely Independen T test and Mann-Whitney test. Independen T test is used to test the age difference of respondents. To examine differences in the variable of duration of DM, BMI, sex, type 2 DM medication, and major complaints, the Mann-Whitney test was used.

III. RESULTS

Descriptive statistics related to the characteristics of type 2 DM patients are shown in Table 1. Sex (Women, 85,4%); Type 2 DM medication (2 kinds of oral medication, 68,3%); major complaints (blurred eyes, 65,9%); complications (Had complications, 58,5%); Type of complication (hypertension, 66,7%). For more details, can be seen on Table 1.

TABLE 1: FREQUENCY DISTRIBUTION OF SEX, EDUCATION, OCCUPATION, EDUCATION, MARITAL STATUS, SMOKING HISTORY, TYPE 2 DM MEDICATION, MAJOR COMPLAINTS (N = 41)

Characteristics	Frequency (f)	Percentage (%)
Sex:		
1. Woman	35	85,4%
2. Man	6	14,6%
DM medication:		
1. Oral 1	8	19,5%
2. Oral 2	28	68,3%
3. Insulin	2	4,9%
4. Combine (oral + insulin)	3	7,3%
Major compliants:		
1. None	3	7,3%
2. Blurred	27	65,9%
3. Tingling sensation	3	7,3%
4. Difficult walking	3	7,3%
5. Headache	3	7,3%
6. Out of breath	1	2,4%
7. Limp	1	2,4%
Complications :		
1. Yes	24	58,5%
2. No	17	41,5%
Type of complications :		
1. Hypertension	16	66,7%
2. Retinopathy	7	29,2%
3. Foot injury	1	4,2%
Total	41	100%

Age (M: 59,2; SD; 9,5); Duration of DM (M: 5,6; SD: 4,4); BMI (M: 26; SD: 4,4). For more details, can be seen on Table 2.

TABLE 2 : THE AVERAGE AGE DIFFERENCE IN TYPE 2 DM PATIENTS BETWEEN THOSE WHO HAD COMPLICATIONS AND THOSE WHO DID NOT HAVE COMPLICATIONS

Variabel (Age)	n	Mean	SD	T (t-test)	P value
Complications	17	60,6	5,66	0,760	0,452
No Complications	24	58,3	11,5		

Bivariate analysis used Mann-Whitney test to examine the difference duration of DM, BMI, sex, occupation, marital status, smoking history, DM medication and major complaints of type 2 DM patients between those who had complications and those who did not have complications. The result showed that there is no difference in the average characteristics of type 2 DM patients between those who had complication and those who did not have complications. For more details, can be seen on table 3

TABLE 3 : THE DIFFERENCES IN CHARACTERISTICS OF TYPE 2 DM PATIENTS BETWEEN THOSE WHO HAD COMPLICATIONS AND THOSE WHO DID NOT HAVE COMPLICATIONS

Variabel		***Mean***	***Mann-Whitney***	***P value***
DM Duration	Comp	23,74	157.500	0,215
	No Comp	19,06		
BMI	Comp	18,32	158.500	0,228
	No Comp	22,90		
Sex	Komplikasi	22,18	184.000	0,464
	Tidak komplikasi	20,17		
DM Medication	Comp	18,97	169.500	0,266
	No Comp	22,44		
Major Complaints	Comp	24,06	152.000	0,103
	No Comp	18,83		

IV. DISCUSSION

The result showed that the majority of type 2 DM patients were female. The high incidence of DM in women compared to men can be caused by differences in body composition and differences in sexual hormone levels between women and men. Women have more adipose tissue than men [5]. This can be seen from the difference in normal fat levels, where in man ranged 15-20%, while in women ranged from 20-25% of body weight. This condition causes insulin resistance [6].

Based on the result of the study showed that the majority type 2 DM patients had complications, with the highest type of complications was hypertension. DM increases the risk of hypertension 1,7 fold [7]. DM patients had metabolic changes such as hyperglycemia, an increase in excess free fatty acids and insulin resistance which cause abnormalities in endothelial cell function due to decreased nitric oxide ability [8]. This is what causes DM patients at high risk of experiencing hypertension.

Age is one risk factor for DM that cannot be modified, where approximately 50% of type 2 DM occurs in the age group of 60 years and above [9]. While in Indonesia, the age limit at risk of developing type 2 DM is age 45 years and above. At the age of 40 years and over, an increase of glucose intolerance begins due to the reduced ability of beta pancreas cells to produce insulin [10]. In addition, based on research at Yale University, at an older age there was an increase in muscle fat levels of 30% which causes insulin resistance [11].

Bivariate analysis on all variables showed no difference in characteristic of type 2 DM patients between those who had complications and those who did not have complication. This show that age, BMI, duration of DM cannot be a benchmark for determining which DM patients are at risk or not at risk for developing DM complications. DM complications can occur both in patients who have long suffer from DM and who have just been diagnosed with DM.

V. CONCLUSION

The conclusion in this study, we provide information about the differences in characteristics of type 2 diabetes mellitus patients between those who have complications and those who do not have complications. The result showed that there was no difference in characteristics of type 2 diabetes mellitus patients between those who had complications and those who did not have complications. DM complications cannot be predicted from the characteristics of patients. So that the prevention of complications should be done as early as possible when the patient is first diagnosed with DM, through the provision of health education and empower patients to adhere with DM treatment.

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