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The Correlation between History of Giving Birth to a Macrosomic Babywith Type 2 Diabetes Mellitus Incidence inElderly Womenin Padang Bulan Health Facility Working Area,Medan Baru Sub-District, 2017

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Abstract : *Diabetes mellitus is in the 6th rank of death causes globally. Patients with diabetes mellitus increased from 108 million in 1980 to 422 million in 2014. Half of new cases of type 2 diabetes mellitus occur in the age group of 55 years or more and most die before they are 70 years old.Its prevalence in Indonesia increases from 1.1% in 2007 to be 2.1% in 2013. It is 2.3% in North Sumatera Province and Medan has the second highest rate of Diabetes Mellitus prevalence with 2.7%. This study aims to discover the correlation between history of giving birth to a macrosomic baby with type 2 diabetes mellitus incidence in elderly women in Padang Bulan Health Facility working area, Medan Baru Sub-District, 2017.This is an observational analytical research which used case control design. The study population was all elderly women aged 60-70 years with a sample of 120 respondents consisting of 60 cases and 60 controls.Sampling technique using purposive sampling. Method o collecting data with questionnaires. The data were analyzed by univariate and bivariate using simple logistic regression. The result of the research showed that there was a relationship between history of giving birth to a macrosomic baby (p= 0,002; OR=3,237; 95% CI 1,52-6,85) with type 2 diabetes mellitus incidence in elderly women. It was concluded that elderly women who had a history of having given birth to a macrosomic baby were 3 times more likely to develop type 2 diabetes mellitus compared with those who did not have a history of giving birth to macrosomic infants.*

Keywords :*Type 2 diabetes mellitus, History of giving birth, Macrosomia,Elderly women*

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I. INTRODUCTION

Diabetes mellitus is a metabolic disease with the characteristics of hyperglycemia due to lack of the amount of the hormone insulin or insufficient amount of insulin sometimes even more but less effective or called insulin resistance[25]. Type 2 diabetes mellitus is a type of diabetes mellitus that occurs because the pancreas does not produce enough insulin so that blood sugar is normal or can occur due to the amount of insulin production but does not function effectively so that the body cannot respond to insulin due to insulin resistance[7]. The number of people with diabetes mellitus in adults worldwide in 2014 was 422 million. *Global status report on Noncommunicable DiseaseWorld Health Organization* 2011, reported about 1.3 million people died from diabetes and 4% died before the age of 70. The 2015 World Health Organization reported that 1.5 million people died from diabetes mellitus which is the number 6 cause of death from all causes of death in the world[26].

According to*American Diabetes Association* 2014, the prevalence of diabetes mellitus patients in the United States was 9.3%, then it increased to 9.4% in 2015. The number of new cases of diabetes mellitus in 2015 was 1.5 million. Asia accounts for 60% of the total diabetes population in the world. In 2007 more than 110 million people in Asia lived with diabetes[4]. The prevalence of diabetes diabetes mellitus in Southeast Asia in 2014 was 8.3%, deaths due to diabetes mellitus occurred in patients under 60 years of age at 53.8%. It is predicted that in 2035 the prevalence of diabetes mellitus in Southeast Asia will increase to 10.1%.Indonesia ranked 4th with the highest number of people with diabetes after the United States, China and India[19]. The prevalence of type 2 diabetes mellitus is more in women[15]. According to Riset Kesehatan Dasar2013, there was an increase in the prevalence of diabetes mellitus in Indonesia from 1.1% in 2007 to 2.1% in 2013. The prevalence of diabetes mellitus in North Sumatra based on interviews diagnosed by doctors and symptoms was 2.3% this amount increased from the 2007 survey of 1.21%. The number of diabetics diagnosed by doctors in Medan City was 2.7%. Most of the elderly with diabetes mellitus in Indonesia are in the age group 60-74 years (83.3%) and most of them are women (52.9%)[19].

The proportion of the elderly population based on sex in 2012, the most of which was women, was 8.2%, while mens were only 6.9%[5]. The results of the analysis of the prevalence of diabetes mellitus based on sex in Indonesia in 2013 also showed that the prevalence of diabetes mellitus in women was 1.7% and in men was 1.4%. The prevalence of diabetes mellitus is higher in women than in men[9].

Predisposing factors for type 2 diabetes mellitus in women is a history of gestational diabetes mellitus, hypertension, dyslipidemia, and hereditary factors are also often associated as predisposing factors[2]. Factors of mothers with gestational diabetes mellitus are at high risk of developing diabetes in the future, with 17% -63% of type 2 diabetes mellitus within 5-16 years in different ethnic groups. Babies born to mothers who have a history of Gestational Diabetes Mellitus will be at risk of developing type 2 diabetes mellitus[22].Women with gestational diabetes mellitus affect 15-45% of macrosomic births. The increased risk of macrosomia in women with gestational diabetes mellitus is caused by an increase in insulin resistance[11].

Gestational diabetes mellitus occurs because the pancreas gland is unable to produce enough insulin to control blood sugar (glucose) at a level that is safe for itself and the fetus it contains. History of giving birth to a baby with birth weight> 4000 g (macrosomia) develops in some women with a history of having had Gestational Diabetes Mellitus (DMG) during pregnancy[10]. Birth weight> 4000 g or macrosomia can indicate hyperglycemia in the mother, so that in a long time it can develop into type 2 diabetes mellitus[24].

Based on a preliminary survey result done by interview with 25 elderly women in Padang Bulan Health Facility, Medan Baru Sub-district, the highest number of people with diabetes mellitus and physical independence are women. From interviews with 25 elderly women aged> 60 years, 14 respondents had a majority of jobs as housewives (56%), the last education was mostly high school as many as 11 respondents (44%), had a history of 17 respondents (68%), experienced obesity as many as 8 respondents (32%).

II. METHOD

This type of research is an observational analytic study with a case control design that is choosing new elderly women diagnosed with type 2 diabetes mellitus in Padang Bulan Health Center in 2016 as a case and elderly women not type 2 diabetes mellitus patients visiting Padang Health Center Moon as control. This design is used to examine the relationship between effects (disease or health conditions) with certain risk factors using a retrospective approach (backward search) whether the case and control are exposed or not[11].

The case population in this study were all elderly women who came for treatment to the health center and were only diagnosed with type 2 diabetes mellitus in Padang Bulan Health Center Medan Baru District in 2016 as many as 161 people. The control population in this study were all elderly women who came to Padang Bulan Health Center, Medan Baru Subdistrict, and were declared not to have type 2 diabetes mellitus. The sampling technique in this study was purposive sampling, where the sample was chosen based on predetermined criteria[21].

Sample calculation is determined using a case control study formula to test hypotheses against two populations[13]with the following formula:

$$n = \frac{\left(Z_{1-\alpha/2}\sqrt{2P(1-P)} + Z_{1-\beta}\sqrt{P_1(1-P_1) + P_2(1-P_2)}\right)^2}{(P_1 - P_2)^2}$$

From the calculation of the sample size, a sample of 60 people was obtained. This study uses a comparison of case control, the number of sample cases is 60 people and the control sample is 60 people. A total sample of 120 people.

III. RESULT AND DISCUSSION

Table 1. Characteristics distribution of elderly women based on education and employment in Padang Bulan Health Facility working area in 2017.

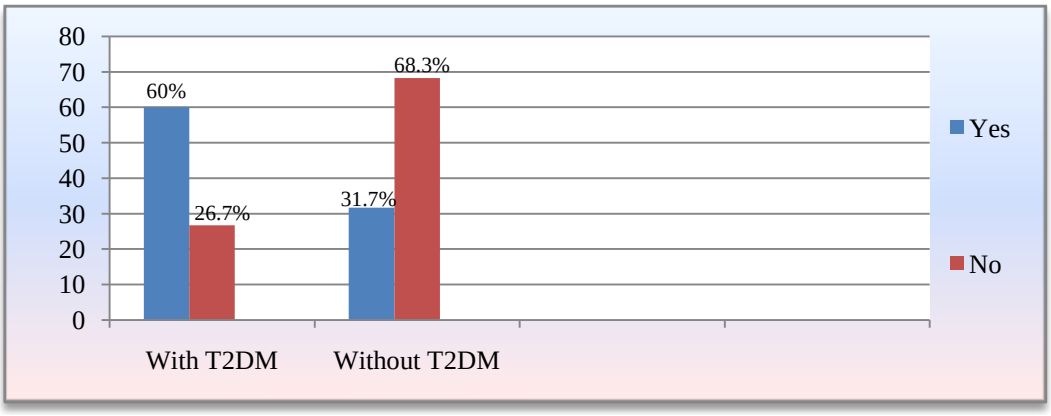
Respondent Characteristics	Incidence of Type 2 Diabetes Mellitus			
	With Type 2Diabetes Mellitus		Without Type 2Diabetes Mellitus	
	n	%	n	%
Last Education				
Elementary Shool	25	41,7	21	35,0
Middle School	14	23,3	13	21,7
High School	17	28,3	18	30,0
Academy/College	4	6,7	8	13,3
Jobs				
Housewife	29	48,3	24	40,0
Retired/Not working	2	33,3	4	6,7
Entepreneur/trader	23	38,3	28	46,7
Private Employees	6	10,0	4	6,7
Total	60	100,0	60	100,0

Table 1. showed the frequency distribution of the most recent last education of the majority of respondents in the case group was primary school as many as 25 respondents (41.7%) and the majority of the last education respondents in the control group were also elementary schools as many as 21 respondents (35.0%). Based on the type of work, the majority of respondents in the case group were housewives as many as 29 respondents (48.3%) and the majority of jobs in the control group were as entrepreneurs/traders as many as 28 respondents (46.7%).

Tabel 2. Distribution of the frequency of history giving birth to macrosomia baby in elderly women in Padang Bulan Health Facility, Medan Baru Sub-Distric 2017

History of giving birth to a macrosomic baby	Incidence of Type 2 Diabetes Mellitus			
	With Type 2 Diabetes Mellitus		Without Type 2 Diabetes Mellitus	
	n	%	n	%
Yes	36	60,0	19	31,7
No	24	40,0	41	68,3

Table 2. showed that the majority of the history of giving birth to a macrosomic baby was experienced by a group of cases as many as 36 respondents (60.0%). In the control group, the majority of respondents did not have a history of giving birth to macrosomic baby as many as 41 respondents (68.3%).



Picture 1. Persentage ofHistory of giving birth to a macrosomic baby

Tabel 3. The Association between History of giving birth to a macrosomic baby with Type 2 Diabetes Mellitus Incidence inelderly womenin Padang Bulan Health Facility Working Area,Medan Baru Sub-District, 2017

Variable	Incidence of Type 2 Diabetes Melitus				*Crude* OR (95% CI)	*p value*
	With Type 2 Diabetes Mellitus		Without Type 2 Diabetes Mellitus			
	n	%	n	%		
History of giving birth to a macrosomic baby						
Yes	36	60,0	19	31,7	3,237	0,002
No	24	40,0	41	68,3	(1,52-6,85)	

Table 3. showed that there is a relationship between the history of having given birth to a macrosomia baby with the incidence of type 2 diabetes mellitus where the value of p = 0.002 with OR = 3.237 (95% CI: 1.52-6.85), meaning that the history of having given birth to a macrosomic baby is 3.237 times more suffering from type 2 diabetes mellitus compared to those who have never given birth to macrosomic baby.

In line with the research conducted by Lawlor, et al concluded that giving birth to a baby weighing> 4000 g (macrosomia) is at risk of developing diabetes mellitus. Women who experience gestational diabetes and give birth to macrosomic babies are 3.56 times more likely to have diabetes mellitus[12]. Macrosomia is closely related to gestational diabetes mellitus[16]. Babies born to mothers who have diabetes will cause complications in both the mother and baby[11].

The incidence of newborns weighing> 4000 g or what is often referred to as macrosomia is 5% of all births[3]. The incidence of macrosomia is at risk of experiencing health problems after birth, such as hypoglycemia, hyperbilirubinemia, to an increased risk of death[8]. Other complications in infants such as childhood obesity and the risk of developing type 2 diabetes mellitus in the future[11]. Obesity in children is at greater risk of becoming obese in adulthood which results in impaired glucose tolerance so that it increases the occurrence of type 2 diabetes mellitus[6,20].

Based on the results of research conducted in the work area of Padang Bulan Health Facility, Medan Baru Sub-district, the majority of type 2 diabetes mellitus respondents had a history of having had a baby with BB> 4000 g. This is one of the triggers that respondents have a risk of suffering from type 2 diabetes mellitus. Babies born with BB> 4000 g will have a bad impact on their health in the future. Large babies (weight exceeding 4000 g) can be caused by excessive maternal weight gain during pregnancy[15]. The incidence of macrosomia is not always preventable, but maintaining a healthy lifestyle such as regulating your diet and weighing your routine during pregnancy can reduce the risk of macrosomia in infants.

IV. CONCLUSION

From the results of the study concluded that there was a relationship between the history of having given birth to macrosomia babies with the incidence of type 2 diabetes mellitus in the work area of Padang Bulan Health Center, Medan Baru Subdistrict with p value = 0.002 (p <0.05). Elderly women with type 2 diabetes mellitus have given birth to macrosomic baby.

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