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Risk Factors for Diabetes Mellitus Occurrence in the Elderly at the Griya Antapani Public Health Center

Ade Saputra Nasution[1], Fitriani Pramita Gurning[2], Muchti Yuda Pratama[3], Fauzan[4]

[1]Faculty of Health Sciences, Universitas Ibn Khaldun Bogor, Indonesia, [2]Faculty of Public Health, Universitas Islam Negeri Sumatera Utara, Indonesia, [3]Faculty of Public Health, Universitas Sumatera Utara, Indonesia, [4]Faculty of Health Sciences, Bhakti Kencana University, Indonesia

Abstract

Diabetes Mellitus is a health disorder that is caused by an increase in insulin levels. Diabetes Mellitus, including disease, is also a risk factor for heart and blood vessel disease. Risk factors for Diabetes Mellitus itself from Abdominal/Central Obesity, Hypertension, Dyslipidemia, and smoking. This study aims to see whether there are factors associated with the place of Diabetes Mellitus in the work area of the Griya Antapani Community Health Center. The research method used is Analytical Epidemiology with a Cross-Sectional approach, Sampling many as 84 respondents. The results of study showed that there was a relationship between Abdominal/Central Obesity, Hypertension, dyslipidemia and smoking the relationship between the incidence of Diabetes Mellitus in the Working Area of the Griya Antapani Public Health Center in Bandung. Based on the results of this study, it is expected that the community will find an unhealthy lifestyle to be healthy.

Keywords**:** *Diabetes Mellitus, Risk Factors, Elderly*

Introduction

Health is a human right and one of the elements of well-being that must be realized in accordance with the ideals of the Indonesian people as referred to in the Pancasila and the 1945 Constitution of the Republic of Indonesia. Anything that causes health problems in Indonesian society will result in economic losses big for the country, and every effort to improve the degree of public health also means investment in the country's development.[1]

Non-communicable diseases are one of the world's health problems and Indonesia, which is still a concern in the world of health, non-communicable diseases are one of the causes of death.[2] Non-communicable diseases, also known as chronic diseases, are not transmitted from person to person, they have a long duration and generally develop slowly.[3]

Corresponding author:
Ade Saputra Nasution
E-mail: adenasutioners@gmail.com

The Ministry of Health of the Republic of Indonesia has established a national policy to control non-communicable diseases since 2005, one of which is the "PROLANIS" or Chronic Disease Control Program implemented by the Health Social Insurance Organizing Agency.[4.5]

One non-communicable disease that is still a global public health problem is Diabetes Mellitus. Diabetes Mellitus is a health disorder in the form of a collection of symptoms caused by increased blood glucose levels due to deficiency or insulin resistance.[6]

Diabetes mellitus, besides being known as a disease, is also a risk factor (FR) for heart and blood vessel disease. Diabetes Mellitus risk factors themselves are divided into 2 (two) parts, namely: 1) Factors that cannot be modified such as Race/Ethnicity, Age, Family History, birth history > 4 kg and birth history <2.5 kg. 2) Modifiable factors such as excess body weight, central obesity, lack of physical activity, high blood pressure, cholesterol, unhealthy diet, history of impaired sugar tolerance and smoking. For this study, the researcher reviewed risk factors that could be modified or

controlled.[7,8]

Material and Method

This research uses a cross-sectional study. The population in this study were the elderly in the Antapani Wetan Village in the work area of Griya Antapani Health Center as many as 5938 people. So in this study the samples taken were as many as 84 people.

Findings

Table 1. Analysis of Risk Factors for Diabetes Mellitus

	Univariate	Bivariate			
	Frequency	Not Diabetes Mellitus	Diabetes Mellitus	Total	P-Value
Not Obesitas Abdominal/Central	26 (31%)	19 (73,1%)	7 (26,9%)	26 (100%)	0,043
Obesitas Abdominal/Central	58 (69%)	27 (46,6%)	31 (53,4%)	58 (100%)	
Not Hypertension	32 (38,1%)	23 (71,9%)	9 (28,1%)	32 (100%)	0,025
Hypertension	52 (61,9%)	23 (44,2%)	29 (55,8%)	52 (100%)	
Not Dyslipidemia	26 (31%)	21 (80,8%)	5 (19,2%)	26 (100%)	0,003
Dyslipidemia	58 (69%)	25 (43,1%)	33 (56,9%)	58 (100%)	
Not Smoke	71 (84.5%)	33 (46,5%)	38 (53,5%)	71 (100%)	0,001
Smoke	13 (15.5%)	13 (100%)	0 (0%)	13 (100%)	
Not Diabetes Mellitus	46 (54.8%)	-	-	-	-
Diabetes Mellitus	38 (45.2%)	-	-	-	

Discussion

Abdominal/Central Obesity

From the results of research in the field, researchers found that most of the respondents experienced Abdominal/ Central Obesity, ie as many as 58 Respondents or 69% of the total Respondents. From the results of statistical tests, the P-value is smaller than α 0.05, which means there is a relationship between Abdominal / Central Obesity and the incidence of Diabetes Mellitus.

The impact of Abdominal / Central Obesity is a higher risk to health. Abdominal /Central obesity can cause health problems such as Diabetes Mellitus and other metabolic syndromes. Metabolic syndrome is a condition in which a person experiences hypertension, Abdominal/ Central Obesity, Dyslipidemia, and insulin resistance at the same time.[9]

A person who has Abdominal/Central Obesity (a man's circumference> 90 cm while in a woman> 80 cm) is 5.19 times the risk of suffering from Diabetes Mellitus. It can be explained that Abdominal/Central

Obesity which is described by waist circumference can predict disorders due to insulin resistance in Diabetes Mellitus. An increase in the amount of abdominal fat has a positive correlation with hyper insulin and is negatively correlated with insulin sensitivity.[10]

A person who has abdominal circumference above normal has more risk for Diabetes Mellitus. The fat stored in that part is visceral fat or visceral fat. In addition to its position in the abdominal cavity so that it covers the vital organs of the body inside it, such as the pancreas and liver, visceral fat also produces cytokine compounds and Free Fatty Acid (FFA) which is dangerous. FFA compounds cause inflammation in the body which increases the risk of developing cancer, increases the potential for coronary heart disease, and causes the body's resistance to insulin, as the main cause of Diabetes mellitus.[11.12]

Hypertension

From the results of the study respondents who experienced high blood pressure or hypertension as many as 52 respondents or 61.9% of all respondents. From the results of statistical tests, p-value ≤ α 0.05 was obtained, which means there is a relationship between hypertension and the incidence of diabetes mellitus.

The effect of hypertension on the incidence of Diabetes Mellitus is caused by thickening of the arteries which causes the diameter of the blood vessels to narrow. This will cause the process of transporting glucose from the blood to cells to be disrupted. A person who has hypertension has 2.3 times the risk of developing Diabetes Mellitus. Increased insulin concentrations that cause hypertension occur due to increased sodium retention in the kidneys and increased sympathetic nervous system activity.[13]

In addition, insulin acts like a growth hormone that can stimulate hypertrophy of the smooth muscle cells of the vessels. Insulin can also increase blood pressure by increasing intracellular calcium concentration, which will lead to increased resistance from vessels.[12]

Dyslipidemia

From the results of the study respondents who experienced high blood cholesterol levels amounted to 58 Respondents or 51.2% of the total Respondents. From the results of statistical tests, p-value ≤ α 0.05 was obtained, which means there is a relationship between Dyslipidemia and the incidence of Diabetes Mellitus.

Dyslipidemia is an abnormality of lipids (fat) in the bloodstream. These lipids include cholesterol, cholesterol esters (compounds), phospholipids and triglycerides. These materials are transported in the blood as part of a large molecule called a lipoprotein. Circulating lipoproteins that only depend on insulin and only exist in plasma glucose. Thus, the performance of the pancreas is inhibited in the spread of insulin in the body and makes blood sugar levels accumulate so that it can cause the incidence of diabetes mellitus.[13]

Smoke

From the results of the study, a small proportion of respondents who consumed tobacco (smoking) were 13 respondents or 15.5% of the total respondents. From the results of statistical tests, the P-value is smaller than 0.05, which means there is a relationship between smoking and the incidence of diabetes mellitus.

Nicotine in cigarettes has been shown to cause insulin receptor resistance and can reduce insulin secretion in the pancreas β cells. Insulin receptor resistance occurs through the nicotine process that stimulates mTOR. mTOR is responsible for cell growth, where if the activity of mTOR is excessive there will be abnormal cell growth and proliferation of insulin receptors so that the receptor does not recognize insulin anymore.[14.13]

Nicotine intake can increase levels of hormones such as cortisol, which can interfere with the effects of insulin, so the risk of diabetes mellitus is higher. Respondents with active smokers are fewer in number than respondents who do not smoke (15.5%). However, passive smokers have a higher risk of active smokers in the vicinity, which is smoking 75% of the smoke emitted by active smokers and only smokes 25%, so that respondents who do not smoke have a higher risk of Diabetes Mellitus.[15.2.14]

Diabetes Mellitus

From the results of research in the field, researchers found that most of the respondents who had Diabetes Mellitus were 38 respondents or 45.2% of the total respondents.

Diabetes Mellitus itself is defined as a disease in which the patient's body cannot automatically control

the level of sugar (glucose) in his blood. Diabetics can not produce insulin in sufficient quantities, resulting in excess sugar in the body. Chronic excess sugar in the blood (hyperglycemia) is toxic to the body. Diabetes Mellitus can be reduced, especially if both parents have severe diabetes, but the emergence of Diabetes Mellitus is more influenced by a bad lifestyle, even in couples who one of them is a Diabetes Mellitus sufferer, then a partner who previously did not suffer from Diabetes Mellitus, in the end, can also have it, because it follows or is influenced by their partner's lifestyle.[16.17.18]

Conclusion

1. Most of the respondents experienced Abdominal/Central Obesity, high blood pressure, cholesterol Working Area of Griya Antapani Health Center, Bandung.

2. A small proportion of respondents consume tobacco (smoking) in the working area of the work area of Puskesmas Griya Antapani, Bandung.

3. Nearly some respondents have Diabetes Mellitus in the Work Area of the Griya Antapani Health Center in Bandung.

4. There is a relationship between Abdominal/ Central Obesity, Hypertension, Dyslipidemia and smoking with the incidence of Diabetes Mellitus in the working area of Puskesmas Griya Antapani, Bandung.

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Ethical Clearance: The study was approved by the institutional Ethical Board of The Bhakti Kencana University.

All subjects were fully informed about the procedures and objectives of this study each subject prior to the study signed an informed consent form.

References

1. Nur A, Fatmaningrum W, Ah Y. Upaya Meningkatkan Perilaku Pasien Dalam Tatalaksana Diabetes Mellitus Dengan Pendekatan Teori Model Behavioral System Dorothy E. Johnson. J Ners. 2011;6:1–10.
2. Trisnawati SK, Setyorogo S. Faktor Risiko Kejadian Diabetes Melitus Tipe II Di Puskesmas Kecamatan Cengkareng Jakarta Barat Tahun 2012. J Ilm Kesehat. 2013;5.
3. Zahtamal FC, Suyanto, Restuastuti T. Faktor-Faktor Risiko Pasien Diabetes Melitus. Ber Kedokt Masy. 2007;23.
4. Primahuda A, Sujianto U. Hubungan Antara Kepatuhan Mengikuti Program Pengelolaan Penyakit Kronis (Prolanis) BPJS Dengan Stabilitas Gula Darah Pada Penderita Diabetes Mellitus Di Puskesmas Babat Kabupaten Laomgan. J Jur Keperawatan. 2016;1–8.
5. Ahmad M, Rini R, Elly LS, Saldy Y. Prolanis Implementation Effective To Control Fasting Blood Sugar, Hba1c And Cholesterol Levels In Patients With Type 2 Diabetes. J Ners. 2017;12:88–9.
6. American Diabetes Association. Diagnosis And Classification Of Diabetes Mellitus. Diabetes Care. 2010;33.
7. Nainggolan O, Kristanto AY, Hendrik E. Determinan Diabetes Melitus Analisis Baseline Data Studi Kohort Penyakit Tidak Menular Bogor 2011. Bul Penelit Sist Kesehat. 2013;16:331–9.
8. Amir SMJ, Herlina W, Damajanty P. Kadar Glukosa Darah Sewaktu Pada Pasien Diabetes Melitus Tipe 2 Di Puskesmas Bahu Kota Manado. J E-Biomedik. 2015;3.
9. Betteng R, Damayanti, Pangemanan Nelly M. Analisis Faktor Resiko Penyebab Terjadinya Diabetes Melitus Tipe 2 Pada Wanita Usia Produktif Dipuskesmas Wawonasa. J E-Biomedik. 2014;2.
10. Triwinarto A, Muljati S, Jahari AB. Cut-Off Point Indeks Massa Tubuh (Imt) Dan Lingkar Perut Sebagai Indikator Risiko Diabetes Dan Hipertensi Pada Orang Dewasa Di Indonesia. Penel Gizi Makan. 2012;35:119–35.
11. Frank BHM., Joann EMM., Meir JSM., Graham CM., Simin LM., Caren GSM., et al. Diet, Lifestyle, And The Risk Of Type 2 Diabetes Mellitus In Women. N Engl J Med. 2001;354.
12. Caspersen C, Beckles G, Albright A. Aging, diabetes, and the public health system in the United States. Am J Public Health. 2012;8.
13. Isnaini N, Ratnasari. Faktor Risiko Mempengaruhi Kejadian Diabetes Mellitus Tipe Dua Risk Factors Was Affects Of Diabetes Mellitus Type 2. J Keperawatan Dan Kebidanan Aisyiyah.

2018;14:59–68.

14. Tri JET, Yunir E, Subekti I, Pramono LA, Martina D. Profile And Analysis Of Diabetes Chronic Complications In Outpatient Diabetes Clinic Of Cipto Mangunkusumo Hospital, Jakarta. Med J Indones. 2015;24:156–62.
15. Hidayati T, Haripurnomo KS. Hubungan Antara Hipertensi, Merokok Dan Minuman Suplemen Energi Dan Kejadian Penyakit Ginjal Kronik. Ber Kedokt Masy. 2008;24.
16. Deshpande A, Hayes M, Schootman M. Epidemiology of diabetes and diabetes-related complications. Phys Ther. 2008;88:1254–64.
17. Awad N, Yuanita AL, Karel P. Gambaran Faktor Resiko Pasien Diabetes Melitus Tipe II Di Poliklinik Endokrin Bagian/Smf Fk-Unsrat RSU Prof. Dr. R.D Kandou Manado Periode Mei 2011 - Oktober 2011. J E-Biomedik. 2013;1:45–9.
18. Rosyada A, Trihandini I. Determinan Komplikasi Kronik Diabetes Melitus pada Lanjut Usia. J Kesehat Masy Nas. 2013;7.