

10. blood cglucosa

by Irip123 Mpfis

Submission date: 23-Jan-2020 01:17AM (UTC-0600)

Submission ID: 1245306903

File name: 10._blood_cglucosa.pdf (143.38K)

Word count: 2531

Character count: 13492

Original Research Article

Blood glucose and uric acid increases the risk of hypertension in elderly

Liena Sofiana^{1*}, Arfiani Nur Khusna², Righa Pradana¹

¹Departement of Public Health, Faculty of Public Health, ²Departement of Informatics Engineering, Faculty of Industrial Technology, Universitas Ahmad Dahlan, Yogyakarta, Indonesia

Received: 25 August 2019

Revised: 07 October 2019

Accepted: 09 October 2019

*Correspondence:

Dr. Liena Sofiana,

E-mail: liena.sofiana@ikm.uad.ac.id

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Hypertension is still a big challenge in Indonesia. Survey data shows that Yogyakarta province is included in the top five provinces with the most cases of hypertension with a number of 35.8% above the average of all Indonesia, which is 31.7%. Life style changes such as dietary changes lead to ready-to-eat dishes that contain lots of fat, high protein and salt but are low in dietary fiber, bringing consequences as one of the factors developing degenerative diseases such as hypertension. The purpose of this study was to determine the relationship between blood glucose and uric acid with the incidence of hypertension in the elderly at Posyandu Lansia Kauman Yogyakarta.

Methods: The study was observational analytic with cross-sectional design. The population in this study were all elderly people living in the Posyandu Lansia Kauman Yogyakarta with a total of 33 people. The instrument used was a checklist sheet and the instrument used was a tensimeter, glucometer and uric acid test. The data analysis technique used is Fisher's test.

Results: There was a significant relationship between blood glucose ($p=0.023$) and uric acid ($p=0.036$) with an increased risk of hypertension in the elderly in the Posyandu Elderly Kauman Yogyakarta.

Conclusions: There is a relationship between blood glucose and uric acid levels with an increased risk of hypertension in the elderly at the Posyandu Lansia Kauman, Yogyakarta.

Keywords: Blood glucose, Uric acid, Hypertension, Elderly

INTRODUCTION

Hypertension is still a big challenge not only in Indonesia, but all over the world. Based on data from the World Health Organization (WHO) in 2011, it is stated that one billion people in the world suffer from hypertension, and 2/3 of them are in developing countries. The prevalence of hypertension has resulted in the death of about 8 million people each year where 1.5 million deaths occur in southeast Asia.¹ Hypertension is still a problem in Indonesia. This is because there are still frequent cases of hypertension in primary health care. Hypertension is mostly suffered by the elderly with a prevalence of 25.8% in 2013.² Hypertension or "high

blood pressure" is a condition when a person experiences an increase in blood pressure either slowly or suddenly. The diagnosis of hypertension is established if a person's systolic blood pressure persists at 140 mmHg or more. The most ideal blood pressure value is 115/75 mmHg.² With increasing age physiologically decreased due to the aging process and coupled with a decrease in endurance so that non-communicable diseases appear in the elderly. At elderly age, there will be various setbacks in body organs. Therefore, the elderly are easily affected by diseases such as hypertension.³

Survey data from the Yogyakarta special district health office in 2010 showed that Yogyakarta province was

included in the top five provinces with the most cases of hypertension with a total of 35.8% above the average of all Indonesia, which was 31.7%.¹ Reported data from the integrated disease survey (STP) at the public health center level in Yogyakarta in 2013, hypertension ranked second after influenza in the ten distribution of diseases with the most visits.⁴ Many factors that contribute to occurrence of hypertension include risks that cannot be controlled (major) and risk factors that can be controlled (minor). Risk factors that cannot be controlled (major) include heredity, gender, race and age. While the risk factors that can be controlled (minor) are obesity, lack of exercise or activity, smoking, drinking coffee, sodium sensitivity, low potassium levels, alcoholism, stress, work, education and eating patterns.¹

Hypertension will be a serious problem, because if it is not treated as early as possible, it will develop and cause dangerous complications such as the occurrence of heart disease, congestive heart failure,¹² stroke, vision problems, and kidney disease. The factors¹² that influence the occurrence of hypertension are divided into two major groups, namely inherent or irreversible factors such as gender, age, genetics and factors that can be changed such as diet, exercise habits and others. For the occurrence of hypertension, it is necessary to play the role of these common risk factors. In other words, one risk factor is not enough to cause hypertension.³ Hypertension can be prevented by avoiding the causes of hypertension by adjusting diet, lifestyle true, avoid coffee, smoking and alcohol, reduce excessive consumption of salt and adequate activities such as regular exercise.⁵

Another factor that causes hypertension is blood glucose levels.¹⁴ Based on previous research, it is explained that there is a relationship between blood glucose levels with blood pressure, controlling blood glucose levels will control the blood pressure of patients.⁶ The contribution of blood glucose levels contributes 40.9% to pressure human blood.⁷ Besides, hypertension can also be influenced by uric acid, the higher the uric acid level, the higher the blood pressure.¹ High uric acid levels are associated with the condition of obesity that is experienced, resulting in hypertension and metabolic syndrome.⁸

METHODS

The design used in this study was observational analysis with a cross-sectional design. This study was conducted at the Posyandu of Eldery in Kauman Yogyakarta Indonesia and data collection was carried out in April 2019. The population and sample in this study amounted 33 respondents because it used total sampling technique so that all populations was sample. The inclusion criteria in this study were elderly who come when this research, are willing to become respondents and have complete measurement data. The variables used in this study were blood glucose and uric acid levels as independent variables and the incidence of hypertension as the

dependent variable. The instrument used was a informed consent is used willingness, approval and ethics of being a respondent; checklist sheet and the instrument used was a tensimeter to measure blood pressure so that hypertension status is known in the respondent, and EasyTouch GCU is used to measure blood glucose and uric acid in the respondent. The data analysis with univariate analysis is to present the frequency distribution of the variables studied, and bivariate analysis with statistical test by Fisher's test.

RESULTS

Based on the characteristics of respondents in Table 1, it is known that distribution of respondents by gender, namely female gender there were 26 respondents (78.79%) and male 7 respondents (21.21%). Based on statistical analysis conducted, seen from the p value obtained at the blood glucose level, it shows the number 0.023 (<0.05).

Table 1: Distribution of respondents by gender, hypertension, blood glucose and uric acid.

No	Respondents characteristics	Total (n)	Percentage (%)
1	Gender		
	Male	7	21.21
	Female	26	78.79
2	Hypertension		
	Yes	4	12.12
	No	29	87.88
3	Blood glucose		
	Abnormal	7	21.21
	Normal	26	78.79
4	Uric acid		
	Abnormal	8	24.24
	Normal	25	75.76
	Total	33	100.0

Table 2: The relationship of blood glucose levels, uric acid with hypertension.

Variable	Hypertension				Sig	Rp (CI 95%)
	Yes	No	Miss	%		
	N	%	N	%		
Blood glucose level						
Abnormal	3	75	4	13.8	0.023	11.143 (1.360-91.329)
Normal	1	25	25	86.2		
Uric acid						
Abnormal	3	75	5	17.2	0.036	9.375 (1.127-77.988)
Normal	1	25	24	82.8		
Total	4	100	29	100		

This shows that there is a relationship between blood glucose levels and hypertension in the elderly in Kauman, Yogyakarta. Also seen from the RP value, blood glucose levels have a value of 11.143 (RP>1). From the RP value,

25 it can be concluded that blood glucose levels are a risk factor for the incidence of hypertension in the Posyandu Elderly Kauman Yogyakarta. Respondents with abnormal blood glucose levels have a risk of 11.143 times greater for hypertension compared with respondents with normal blood glucose levels. The relationship between blood glucose levels and the incidence of hypertension is strengthened with a range of 95% CI values, namely 1,360-91,329, where the 95% value does not include the number 1, meaning that there is a relationship between blood glucose levels and hypertension (Table 2).

DISCUSSION

17 The relationship of blood glucose levels with hypertension

18 The results of this study indicate that there was a relationship between blood glucose levels and hypertension. Hypertension was also a major risk factor for diabetes mellitus. The relationship with type 2 diabetes mellitus was very complex, hypertension can make cells insensitive to insulin (insulin resistant). Though insulin plays a role in increasing glucose uptake in many cells and in this way also regulates carbohydrate metabolism, so that if there is insulin resistance by cells, then the level of glucose in the blood can also be disrupted.⁹

Insulin resistance often occurs in patients with essential hypertension. Insulin has the effect of decreasing serum uric acid excretion accompanied by the ability to hold sodium. Increased serum uric acid levels are influenced by increased activity of the sympathetic nervous system caused by hyperuricemia. The idea that hyperuricemia can be an indicator of insulin resistance has been proven in an 8-year longitudinal study that has shown that insulin resistance is associated with hyperuricemia. Therefore hyperuricemia in patients with hypertension can be a sign of insulin resistance that is directly linked to an increased risk of cardiovascular disease.¹⁰

1 Glucose in general and fructose in particular play an important role in developing the risk of hypertension and heart disease through various mechanisms. Glucose can affect blood pressure, levels of myocardial oxygen demand, heart rate, and inflammation. In packaged foods or processed foods (which must be limited consumption for people with hypertension), not only salt or sodium are contained in it, but it also contains carbohydrate (glucose). Consuming about 700 ml of soft drinks has been shown to cause an average increase in blood pressure of 15/9 mmHg and a heart rate of 9 bpm.¹¹

11 Sp. (ETS) The relationship between uric acid and hypertension

28 results of this study indicate that there was a relationship between uric acid levels with hypertension. Patients suffering from hypertension with type 2 diabetes had higher mean uric acid levels than patients who suffer

from hypertension without diabetes type 2.¹¹ Also explained that there was a strong relationship between uric acid with systolic and diastolic blood pressure, the increase in blood pressure was characterized by an increase in levels serum uric acid.¹² High prevalence occurs in hypertensive patients who have high uric acid levels, this is regardless of age and gender so measurement of uric acid levels can help identify the risk of hypertension.¹³

Uric acid has a close relationship with systolic blood pressure, hypertensive patients with hyperuricemia should be given strict warnings of a high sodium diet. Impaired renal uric acid clearance occurs because a decrease in glomerular filtration rate (GFR), so uric acid must be measured in all cases of hypertension together with BMI, total cholesterol, triglycerides and care must be taken to avoid the occurrence of metabolic complications.¹⁴

CONCLUSION

15 There is a relationship between blood glucose and uric acid with hypertension in the elderly at the Posyandu Lansia Kauman, Yogyakarta. Maintaining normal blood glucose and uric acid level can prevent a person from developing hypertension.

ACKNOWLEDGEMENTS

8 We would like to thank to the ministry of research and higher education for providing assistance in the community service program and its outcomes.

16 **Addressing:** Ministry of research and higher education, Indonesia
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Kementerian Kesehatan Republik Indonesia. Sebagian Besar Penderita Hipertensi Tidak Menyadarinya. 2017: 3-4.
2. Kementerian Kesehatan Republik Indonesia. Hipertensi. Jakarta: Pusat Data dan Informasi Kementerian Kesehatan Republik Indonesia; 2017: 147-160.
3. Kementerian Kesehatan Republik Indonesia. Profil Kesehatan Indonesia Tahun 2017. Jakarta; 2017.
4. Profil Kesehatan Daerah Istimewa Yogyakarta Tahun 2016 (Data Tahun 2015). Vol. 2016. Daerah Istimewa Yogyakarta: Dinas Kesehatan D.I Yogyakarta; 2016: 1-290.
5. Dalimartha. Care Your Self Hipertensi. Jakarta: Penebar Plus; 2008.
6. Winta AE, Setiyorini E, Wulandari NA. Hubungan Kadar Gula Darah dengan Tekanan Darah pada Lansia Penderita Diabetes Tipe 2. J Ners dan Kebidanan. 2018;5(2):163-71.

7. Huda SA. Hubungan Antara Kadar Glukosa Darah Dengan Tekanan Darah Manusia Di Rw 03 Kelurahan Kebayoran Lama Jakarta Selatan. *BIOEDUKASI: J Pendidik Biol*. 2016;7(2):144-52.
8. Monikasari, Ardiaria M, Widyastuti N. Hubungan Kadar Asam Urat dengan Tekanan Darah pada Remaja Obesitas di Kota Semarang. *J Nutr Coll*. 2017;6(4):360-7.
9. Sihombing M. Faktor yang Berhubungan dengan Hipertensi pada Penduduk Indonesia yang Menderita Diabetes Melitus (Data Riskesdas 2013). *Bul Penelit Kesehat*. 2017;45(1):53-64.
10. Maulana Y, Novita I, Oktoviano RI. Perbedaan Kadar Asam Urat Pada Penderita Hipertensi Dengan Diabetes Melitus Tipe 2 Dan Tanpa Diabetes Melitus Tipe 2. *Biomedika*. 2017;8(1):35-40.
11. Dinicolantonio JJ, Lucan SC. The wrong white crystals: not salt but sugar as aetiological in hypertension and cardiometabolic disease. *Open Hear*. 2014;1(e000167):1-8.
12. Assob JCN, Ngowe MN, Nsagha DS, Njunda AL, Waidim Y, Lemuh DN, et al. The Relationship between Uric Acid and Hypertension in Adults in Fako Division, SW Region Cameroon. *J Nutr Food Sci*. 2014;4(1):1-4.
13. Chowdeswari N, Jaya N, Rao BR. Association between Serum Uric Acid Levels and Hypertension: A Retrospective Study. *Int J Clin Biochem Res*. 2016;3(1):129-33.
14. Afifi A, Sarhan I, Sharkawy MEI, Kamel M, Anwar W, Helmy N, et al. Uric Acid Metabolism in a Sample of Egyptian Hypertensive Patients with Normal Kidney Function. *Egypt J Hosp Med*. 2013;52:608-14.

Cite this article as: Sofiana L, Khusna AN, Pradana R. Blood glucose and uric acid increases the risk of hypertension in elderly. *Int J Community Med Public Health* 2019;6:4706-9.

10. blood cglucosa

ORIGINALITY REPORT

31 %

SIMILARITY INDEX

20 %

INTERNET SOURCES

22 %

PUBLICATIONS

20 %

STUDENT PAPERS

PRIMARY SOURCES

1	"Disorders of Blood Pressure Regulation", Springer Science and Business Media LLC, 2018 Publication	3 %
2	www.msjonline.org Internet Source	3 %
3	Submitted to Universitas Diponegoro Student Paper	2 %
4	mail.ijcmph.com Internet Source	2 %
5	Submitted to Universitas Airlangga Student Paper	2 %
6	worldwidescience.org Internet Source	1 %
7	www.boonhealth.com Internet Source	1 %
8	Christianus Heru Setiawan, Aris Widayati, Dita Maria Virginia, Carol Armour, Bandana Saini. "The role of pharmacists in the pharmaceutical	1 %

care of asthma patients in Yogyakarta,
Indonesia: the patients' views", Journal of
Asthma, 2019

Publication

9	Submitted to iGroup Student Paper	1%
10	healthdocbox.com Internet Source	1%
11	www.omicsonline.org Internet Source	1%
12	Novita Verayanti Manalu. "The INFLUENCE OF HYPERTENSION EXERCISE ON BLOOD PRESSURE IN ELDERLY HYPERTENSION IN THE KEDATON COMMUNITY HEALTH CENTER PENENGAHAN RAYA VILLAGE BANDAR LAMPUNG", Abstract Proceedings International Scholars Conference, 2019 Publication	1%
13	www.researchgate.net Internet Source	1%
14	garuda.ristekdikti.go.id Internet Source	1%
15	ghrnet.org Internet Source	1%
16	Submitted to Universitas Jenderal Soedirman Student Paper	

1%

17

B. Ruhnau, O.K. Faber, K. Borch-Johnsen, B. Thorsteinsson. "Renal threshold for glucose in non-insulin-dependent diabetic patients", *Diabetes Research and Clinical Practice*, 1997

Publication

1%

18

www.scribd.com

Internet Source

1%

19

medkesfkm.unsrat.ac.id

Internet Source

1%

20

healthcanbefun.blogspot.com

Internet Source

1%

21

Herman Yuliansyah, Lisna Zahrotun. "Designing web-based data mining applications to analyze the association rules tracer study at university using a FOLD-growth method", *International Journal of Advanced Computer Research*, 2016

Publication

1%

22

www.ijcmph.com

Internet Source

1%

23

Submitted to Higher Education Commission Pakistan

Student Paper

1%

24

Submitted to Queen Mary and Westfield College

Student Paper

<1%

25

Submitted to Staffordshire University

Student Paper

<1%

26

www.kjmclaughlin.com

Internet Source

<1%

27

Submitted to Universitas Islam Indonesia

Student Paper

<1%

28

H.S. Goldstein, P. Manowitz. "Relation between serum uric acid and blood pressure in adolescents", Annals of Human Biology, 2009

Publication

<1%

29

E H Baker. "Hyperglycaemia is associated with poor outcomes in patients admitted to hospital with acute exacerbations of chronic obstructive pulmonary disease", Thorax, 2006

Publication

<1%











Exclude quotes On

Exclude matches Off








Exclude bibliography On

10. blood cglucosa

PAGE 1

-  **Article Error** You may need to use an article before this word. Consider using the article **the**.
-  **Sp.** This word is misspelled. Use a dictionary or spellchecker when you proofread your work.
-  **Sp.** This word is misspelled. Use a dictionary or spellchecker when you proofread your work.
-  **Prep.** You may be using the wrong preposition.
-  **Article Error** You may need to remove this article.
-  **Missing ","** Review the rules for using punctuation marks.
-  **Article Error** You may need to remove this article.
-  **Sp.** This word is misspelled. Use a dictionary or spellchecker when you proofread your work.
-  **Article Error** You may need to use an article before this word.
-  **P/V** You have used the passive voice in this sentence. You may want to revise it using the active voi

PAGE 2

-  **Prep.** You may be using the wrong preposition.
-  **Article Error** You may need to remove this article.
-  **Confused** You have used either an imprecise word or an incorrect word.
-  **Proofread** This part of the sentence contains an error or misspelling that makes your meaning unclear.
-  **Sp.** This word is misspelled. Use a dictionary or spellchecker when you proofread your work.
-  **P/V** You have used the passive voice in this sentence. You may want to revise it using the active voi
-  **Article Error** You may need to use an article before this word.



Article Error You may need to use an article before this word.



Missing "," Review the rules for using punctuation marks.



Article Error You may need to use an article before this word. Consider using the article **the**.



P/V You have used the passive voice in this sentence. You may want to revise it using the active voice.



Missing "," Review the rules for using punctuation marks.



Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.



Frag. This sentence may be a fragment or may have incorrect punctuation. Proofread the sentence to be sure that it has correct punctuation and that it has an independent clause with a complete subject and predicate.



Possessive Review the rules for possessive nouns.



Missing "," Review the rules for using punctuation marks.



Run-on This sentence may be a run-on sentence.



P/V You have used the passive voice in this sentence. You may want to revise it using the active voice.



Missing "," Review the rules for using punctuation marks.



Article Error You may need to use an article before this word.



S/V This subject and verb may not agree. Proofread the sentence to make sure the subject agrees with the verb.



Article Error You may need to use an article before this word.



Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.



Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.



Proofread This part of the sentence contains an error or misspelling that makes your meaning unclear.

unclear.



Prep. You may be using the wrong preposition.



P/V You have used the passive voice in this sentence. You may want to revise it using the active voice.



Run-on This sentence may be a run-on sentence.



Prep. You may be using the wrong preposition.



Article Error You may need to use an article before this word. Consider using the article **the**.



P/V You have used the passive voice in this sentence. You may want to revise it using the active voice.



Prep. You may be using the wrong preposition.



Sp. This word is misspelled. Use a dictionary or spellchecker when you proofread your work.