# LEMBAR HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
## KARYA ILMIAH: JURNAL ILMIAH*

Judul karya ilmiah (artikel)   :   Blood Glucos And Uric Acid Increases The Risk Of Hipertension In Elderly
Jumlah Penulis   :   3   Orang
Nama Penulis   :   Liena Sofiana, Arfiani Nur Khusna, Righa Pradana
Status Pengusul   :   ~~Penulis Tunggal~~/Penulis pertama/~~penulis ke~~ /~~penulis korespodensi~~ **
Identitas Jurnal Ilmiah   :  
     a. Nama Jurnal     : Epidemology And Society Health Review ESHR
     b. No ISSN        : p-issn 2394-6032, e-issn 2394-6040
     c. Vol, No, Bulan, Tahun : Vol. 6, No. 11, November, 2019
     d. Penerbit         :
     e. DOI artikel (jika ada) : DOI : http://dx.doi.org/10.18203/2394-6040.ijcmph20195034
     f. Alamat web jurnal  : https://www.ijcmph.com/index.php/ijcmph
     g. Terindeks Scimagojr/Thomson Reuter ISI Knowledge atau di...**

Kategori Publikasi Jurnal Ilmiah :
(beri V pada kategori yang tepat)

☐ Jurnal Ilmiah Internasional/Int. Bereputasi**
☐ Jurnal Ilmiah Nasional Terakreditasi
☐ Jurnal Ilmiah Nasional/ Nasional Terindeks di DOAJ, CABI, COPERNICUS**

Hasil Penilaian *Peer Review* :

| Komponen yang dinilai | Nilai Maksimal Jurnal Ilmiah (isikan di kolom yang sesuai) | | | | | Nilai Akhir Yang Diperoleh |
|---|---|---|---|---|---|---|
| | Internasional Bereputasi | Internasional | Nasional Terakreditasi | Nasional Tidak Terakreditasi | Nasional Terindeks DOAJ dll | |
| a. Kelengkapan unsur isi artikel (10%) | | 2 | | | | 1,98 |
| b. Ruang lingkup dan kedalaman pembahasan (30%) | | 6 | | | | 5.8 |
| c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%) | | 6 | | | | 5,7 |
| d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%) | | 6 | | | | 5,7 |
| Total = (100%) | | 20 | | | | 19,18 |
| Nilai Pengusul | | 12 | | | | 11.5 |

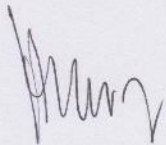| Komentar Peer Review | |
|---|---|
| | 1. Tentang kelengkapan dan kesesuaian unsur : sudah baik, sudah sesuai dengan unsur-unsur penulisan ilmiah |
| | 2. Tentang ruang lingkup & kedalaman pembahasan : Sudah baik, hasil penelitian dibahas sesuai teori dan dibandingkan dengan penelitian lain |
| | 3. Kecukupan dan kemutakhiran data serta metodologi : Sudah baik. data hasil penelitian berguna bagi informasi bidang kesehatan saat ini |

4. Kelengkapan unsur kualitas penerbit : sudah baik, jurnal bersifat online dan tidak termasuk kategori predator

5. Indikasi plagiasi : tidak ada plagiasi

6. Kesesuaian bidang ilmu : sudah baik, topik penelitian sesuai dengan bidang ilmu peneliti.

2019

Reviewer 1/~~2~~*

Nama      Dr. Dra. R. Siti Nur Djannah, M.Kes
NIP/~~NIY~~  1964.05.22.1989.03.2005
Bidang Ilmu   Kesmas
Jabatan Akademik   Lektor Kepala
Unit Kerja   FKM

*dinilai oleh dua Reviewer secara terpisah
** coret yang tidak perlu
*** nasional/ terindeks di DOAJ, CABi, Copernicus

# LEMBAR HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
## KARYA ILMIAH: JURNAL ILMIAH*

Judul karya ilmiah (artikel) : Blood Glucos And Uric Acid Increases The Risk Of Hipertension In Elderly
Jumlah Penulis : 3 Orang
Nama Penulis : Liena Sofiana, Arfiani Nur Khusna, Righa Pradana
Status Pengusul : ~~Penulis Tunggal~~/Penulis pertama/~~penulis ke~~ /~~penulis korespodensi~~ **
Identitas Jurnal Ilmiah : a. Nama Jurnal : Epidemology And Society Health Review ESHR
  b. No ISSN : p-issn 2394-6032, e-issn 2394-6040
  c. Vol, No, Bulan, Tahun : Vol. 6, No. 11, November, 2019
  d. Penerbit :
  e. DOI artikel (jika ada) : DOI : http://dx.doi.org/10.18203/2394-6040.ijcmph20195034
  f. Alamat web jurnal : https://www.ijcmph.com/index.php/ijcmph
  g. Terindeks Scimagojr/Thomson Reuter ISI Knowledge atau di...**

Kategori Publikasi Jurnal Ilmiah : [✓] Jurnal Ilmiah Internasional/Int. Bereputasi**
(beri V pada kategori yang tepat) [ ] Jurnal Ilmiah Nasional Terakreditasi
  [ ] Jurnal Ilmiah Nasional/ Nasional Terindeks di DOAJ, CABI, COPERNICUS**

Hasil Penilaian *Peer Review* :

| Komponen yang dinilai | Nilai Maksimal Jurnal Ilmiah (isikan di kolom yang sesuai) | | | | | Nilai Akhir Yang Diperoleh |
| --- | --- | --- | --- | --- | --- | --- |
| | Internasional Bereputasi | Internasional | Nasional Terakreditasi | Nasional Tidak Terakreditasi | Nasional Terindeks DOAJ dll | |
| a. Kelengkapan unsur isi artikel (10%) | | 2 | | | | 2 |
| b. Ruang lingkup dan kedalaman pembahasan (30%) | | 6 | | | | 5 |
| c. Kecukupan dan kemutakhiran data/informasi dan metodologi (30%) | | 6 | | | | 4 |
| d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%) | | 6 | | | | 5 |
| Total = (100%) | | 20 | | | | 16 |
| Nilai Pengusul | | 12 | | | | 9,6 |

| Komentar Peer Review | 1. Tentang kelengkapan dan kesesuaian unsur : |
| --- | --- |
| | cukup |
| | 2. Tentang ruang lingkup & kedalaman pembahasan : |
| | very cukup dan kedalam pembhn cukp |
| | 3. Kecukupan dan kemutakhiran data serta metodologi : |
| | - data cukup dan mutakhir |
| | - metodolg. cukup |

4. Kelengkapan unsur kualitas penerbit :

Cukup

5. Indikasi plagiasi :

Tidak ada

6. Kesesuaian bidang ilmu :

cukup

2019

Reviewer 1/2 *

Nama ... Prof. Dr. Rusdi Lamsudin, MMed Sc, SpSLK

NIP/NIY. ...

Bidang Ilmu ... Neuro - Clinical Epidemiology

Jabatan Akademik ... Dekan

Unit Kerja ... FK Unisula

*dinilai oleh dua Reviewer secara terpisah

** coret yang tidak perlu

*** nasional/ terindeks di DOAJ, CABi, Copernicus

## Original Research Article

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

## Liena Sofiana[1]*, Arfiani Nur Khusna[2], Righa Pradana[1]

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

**\*Correspondence:**
Dr. Liena Sofiana,
E-mail: liena.sofiana@ikm.uad.ac.id

## 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 the 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. 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%. 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 the 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.[4]

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, stroke, vision problems, and kidney disease. The factors 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. 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. 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 Indomesia 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 eldery who come when this reserach, 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 inform concern is used willingness, aprroval 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, hypertention, 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 | | | |
| | 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,

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 CI95% value does not include the number 1, meaning that there is a relationship between blood glucose levels and hypertension (Table 2).

## DISCUSSION

### The relationship of blood glucose levels with hypertension

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 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]

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 carbohydrates (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]

### The relationship between uric acid and hypertension

The 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.[10] Also explained that there was a strong relationship between uric acid with systolic and diastolic blood pressure, this 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 before 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

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

## 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 MEl, 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.