JONDPAC

JOURNAL OF NONCOMMUNICABLE DISEASES PREVENTION AND CONTROL

Volume 3, Issue 1, April 2025, pp. 16-18

ISSN 2987-1549 (Online)

DOI: https://doi.org/10.61843/jondpac.v3i1.997

Research Article

THE RELATIONSHIP BETWEEN URIC ACID LEVELS AND HYPERTENSION IN PROLANIS PATIENTS AT THE SINGANDARU PUBLIC HEALTH CENTER, SERANG CITY

Al Fina Nurhidayah[1] ✉, Syarah Anliza[2], Adipura Atmadja Egok[3], Dewi Maria Yuliani[4], Liu Zhi hong[5]

[1,2,4]Department of Medical Laboratory Technology, The Polytechnic of Health of Banten, Tangerang Indonesia
[3]Faculty of Medicine, Borneo Tarakan University
[5]Chinese Academy of Medical Sciences, China

KEYWORDS

Uric acid
Hypertension
Prolanis

ABSTRACT

Hypertension is a chronic disease with a continuously increasing prevalence in Indonesia, including in Serang City. One of the contributing risk factors for hypertension is elevated uric acid levels (hyperuricemia). An imbalance between the production and excretion of uric acid can lead to its accumulation in the blood, which may trigger an increase in blood pressure. The Chronic Disease Management Program (Prolanis) at Public Health Centers aims to provide integrated management of chronic conditions such as hypertension. This study aimed to determine the relationship between uric acid levels and the incidence of hypertension among Prolanis patients at the Singandaru Public Health Center, Serang City. This study employed an analytical design with a cross-sectional approach. The study population consisted of 92 Prolanis patients, with a sample of 50 patients selected for analysis. Bivariate analysis using the Chi-square test yielded a p-value of 0.000 ($p < 0.05$), indicating a statistically significant relationship between uric acid levels and hypertension among Prolanis patients. In conclusion, there is a significant relationship between uric acid levels and hypertension among Prolanis patients at the Singandaru Public Health Center, Serang City.

Kata Kunci

Asam urat
Hipertensi
Prolanis

ABSTRAK

Hipertensi merupakan penyakit kronis dengan prevalensi yang terus meningkat di Indonesia, termasuk di Kota Serang. Salah satu faktor risiko yang berkontribusi terhadap hipertensi adalah peningkatan kadar asam urat (hiperurisemia). Ketidakseimbangan antara produksi dan ekskresi asam urat dapat menyebabkan penumpukan dalam darah, yang pada akhirnya dapat memicu peningkatan tekanan darah. Program Pengelolaan Penyakit Kronis (Prolanis) di Puskesmas bertujuan untuk memberikan penatalaksanaan terpadu terhadap penyakit kronis seperti hipertensi. Penelitian ini bertujuan untuk mengetahui hubungan antara kadar asam urat dan kejadian hipertensi pada pasien Prolanis di Puskesmas Singandaru, Kota Serang. Penelitian ini menggunakan desain analitik dengan pendekatan cross-sectional. Populasi penelitian terdiri dari 92 pasien Prolanis, dengan sampel sebanyak 50 pasien. Analisis bivariat menggunakan uji Chi-square menghasilkan nilai $p = 0,000$ ($p < 0,05$), yang menunjukkan adanya hubungan yang signifikan secara statistik antara kadar asam urat dan hipertensi pada pasien Prolanis. Kesimpulan dari penelitian ini adalah terdapat hubungan yang signifikan antara kadar asam urat dan hipertensi pada pasien Prolanis di Puskesmas Singandaru, Kota Serang.

✉ ***Corresponding Author:***

Al Fina Nurhidayah
Department of Medical Laboratory Technology, The Polytechnic of Health of Banten, Tangerang Indonesia
alfinanurhidayah6@gmail.com

Citation:

Nurhidayah, A. F., Anliza, S., Egok, A. A., Yuliani, D. M (2026). The Relationship Between Uric Acid Levels and Hypertension in Prolanis Patients at the Singandaru Public Health Center, Serang City. *Journal of Noncommunicable Diseases Prevention and Control*. 3(1): 16-18.

INTRODUCTION

Hypertension is a chronic disease whose prevalence continues to increase significantly both in Indonesia and worldwide. Data from the World Health Organization show that the global number of people

with hypertension increased from 650 million in 1990 to 1.28 billion in 2019. In Indonesia, based on data from the Riset Kesehatan Dasar (Riskesdas), the prevalence of hypertension increased from 25.8% in 2013 to 34.1% in 2021, with a high number of cases also reported in Banten Province, particularly in Serang City.
The Chronic Disease Management Program (Prolanis), implemented by Public Health Centers in collaboration with BPJS Kesehatan, aims to reduce the burden of this disease through integrated management of hypertensive patients.

One of the important risk factors for hypertension is elevated uric acid levels (hyperuricemia), which can worsen blood pressure conditions. Uric acid is the final product of purine metabolism and may increase due to high-purine food consumption and metabolic imbalances. Previous studies have demonstrated a significant relationship between uric acid levels and the degree of hypertension across various age groups. However, studies examining this relationship among Prolanis patients at the Singandaru Public Health Center in Serang City are still limited.

Based on this background, the research question of this study is whether there is a relationship between uric acid levels and hypertension among Prolanis patients at the Singandaru Public Health Center, Serang City. The purpose of this study is to determine the relationship between uric acid levels and hypertension in these patients as an effort to support the Prolanis program in managing chronic diseases. The theoretical framework of this study includes the concept of hypertension, its risk factors, particularly the role of uric acid in increasing blood pressure, and the implementation of chronic disease management programs in primary healthcare settings.

MATERIALS AND METHODS

Instruments, Materials, and Samples

This study was conducted at the Singandaru Public Health Center in 2025, involving 50 female patients selected using a purposive sampling technique based on inclusion and exclusion criteria. The data collected were primary data, including blood pressure and uric acid levels.

Blood pressure was measured using a sphygmomanometer, while uric acid levels were measured using a POCT GCU device (Easy Touch). The materials used included uric acid test strips (Easy Touch), lancets, alcohol swabs, and cotton.

The collected data were analyzed using the Chi-square test with SPSS version 23 to determine the relationship between uric acid levels and hypertension.

RESULT AND DISCUSSION

The frequency distribution of respondent characteristics was obtained from two integrated health post (posbindu) locations, namely the Kelapa Dua Prolanis Club and the Kavling Brimob Posyandu, based on age.

Table 1. Respondent Characteristics

Variable	Frequency (n)	Percentage (%)
Age Group		
45-59 years	30	60
60-74 years	19	38
75-90 years	1	2
Total	**50**	**100**

Based on the results presented in Table 1, the majority of participants in the Prolanis program were in the 45–59 years age group, accounting for 30 respondents (60%) of the total sample. This age group represents a stage of life in which the risk of chronic diseases, including hypertension, begins to increase. Therefore, the high participation in this group may reflect greater awareness of the importance of continuous health management.

In contrast, the least represented group was individuals aged 75–90 years, with only 1 respondent (2%). Meanwhile, 19 respondents (38%) were in the 60–74 years age group. These findings are consistent with previous studies indicating that the incidence of hypertension increases with age, particularly from 35–44 years and continuing into older age groups.

In addition, the majority of respondents in this study were female. This may reflect a higher level of awareness and participation among women in chronic disease management programs. It may also be influenced by factors such as differences in disease prevalence, social roles, and access to healthcare services between men and women.

Various factors can influence the occurrence of increased blood pressure, including age and sex, both of which are important non-modifiable risk factors for hypertension.

Table 2. Distribution of Sample HDL Levels by Hypertension Grade

Variable	Frequency (n)	Percentage (%)
High	32	64
Normal	18	36
Total	**50**	**100**

Prolanis patients underwent uric acid testing using a point-of-care testing (POCT) device. The results, as shown in Table 2, indicate that the majority of patients had elevated uric acid levels, accounting for 32 patients (64%), while 18 patients (36%) had normal levels.

Uric acid is the final product of purine metabolism in humans, formed from xanthine by the enzyme xanthine oxidase and excreted through the urine. In general, uric acid levels may increase due to the consumption of purine-rich foods such as red meat, seafood, fatty foods, alcohol, and sugary (fructose-containing) beverages.

In addition to dietary factors, genetic predisposition and obesity also play important roles in elevated uric acid levels. Furthermore, hyperuricemia is commonly found in individuals with primary and severe hypertension.

Table 3. Frequency Distribution of Blood Pressure in Patients

Variable	Frequency (n)	Percentage (%)
Systolic Blood Pressure		
High ≥ 130 mmHg	40	80
Normal ≤ 130 mmHg	10	20
Diastolic Blood Pressure		
High ≥ 85 mmHg	40	80
Normal ≤ 85 mmHg	10	20
Total	**50**	**100**

Based on Table 3, secondary data indicate that all examined Prolanis patients had elevated systolic and diastolic blood pressure, totaling 50 patients (100%). In general, patients enrolled in the Prolanis program at the Singandaru Public Health Center have a history of hypertension.

Hyperuricemia and hypertension are common metabolic conditions that can significantly affect an individual's quality of life. According to Masenga and Kirabo, several factors contribute to increased blood pressure, including advanced age, race or ethnicity, excess body weight, physical inactivity, high salt intake, smoking, alcohol consumption, and comorbid conditions such as diabetes.

Table 4. Relationship Between Uric Acid Levels and Hypertension

Uric Acid Level	Blood Pressure: High (n)	High (%)	Normal (n)	Normal (%)	Total (n)	Total (%)	P-value
High	31	62	1	2	32	64	.000
Normal	9	18	9	18	18	36	

Based on Table 4, the majority of patients with elevated uric acid levels (hyperuricemia) also had hypertension, accounting for 31 patients (62%). In addition, 9 patients (18%) had hyperuricemia without hypertension, 1 patient (2%) had hypertension without hyperuricemia, and 9 patients (18%) had neither condition. Bivariate analysis using the Chi-square test yielded a p-value of 0.000 ($p < 0.05$), indicating a statistically significant relationship between uric acid levels and hypertension. Therefore, the alternative hypothesis (H1) is accepted. These findings are consistent with previous studies, such as Rajagukguk et al., which also demonstrated an association between uric acid levels and hypertension.

From a pathophysiological perspective, the relationship between elevated uric acid levels and increased blood pressure has been widely documented. Evidence suggests that each 1 mg/dL increase in uric acid levels may increase the risk of hypertension by approximately 13%. Mechanistically, uric acid is thought to inhibit nitric oxide production in endothelial cells, activate the renin–angiotensin–aldosterone system

(RAAS), and increase oxidative stress. These processes contribute to endothelial dysfunction, vascular damage, and vasoconstriction, ultimately leading to elevated blood pressure.

In addition, genetic variations such as those in the SLC2A9 and GLUT9 genes, which regulate uric acid transport, may also play a role in the development of hypertension. Hyperuricemia is considered a strong and independent risk factor for hypertension, with approximately twice the risk within 5–10 years, particularly among older adults or individuals with renal impairment.

Thus, this study supports previous evidence that elevated uric acid levels may serve as an early indicator of hypertension. These findings are also consistent with Sanchez-Lozada et al., who reported that hyperuricemia contributes to endothelial dysfunction, RAAS activation, and oxidative stress, all of which leads to increased blood pressure.

Therefore, monitoring uric acid levels and implementing lifestyle modifications—such as a low-purine diet, adequate hydration, weight management, and regular physical activity—are essential for the prevention and control of hypertension, particularly among high-risk populations. This study also provides a basis for clinical interventions and community-based health education in the comprehensive management of chronic diseases.

CONCLUSION

The majority of Prolanis patients with hypertension were in the 45–59 years age group and were predominantly female. Bivariate analysis using the Chi-square test showed a significant relationship between uric acid levels and hypertension among Prolanis patients at the Singandaru Public Health Center, Serang City.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ACKNOWLEDGMENTS

The author would like to thank the Singandaru Public Health Center, all respondents, and the supervisors for their support and contributions to this study.

REFERENCES

Adhari and Ayu, R. Hubungan hipertensi dengan kadar asam urat pada lansia di UPTD Puskesmas 1 Denpasar Selatan.

Badan Penyelenggara Jaminan Sosial Kesehatan Peraturan Badan Penyelenggara Jaminan Sosial Kesehatan Nomor 2 Tahun 2019 Tentang Pelaksaan Skrining Riwayat Kesehatan Dan Pelayanan.

Darmayanti, N. kadek Hubungan konsumsi kopi dan aktivitas fisik dengan kadar kolestrol total pada lansia di Desa Temesi Kabupaten Gianyar.

Ekarini, N.L.P. et al. Pengaruh edukasi tentang penatalaksanaan pada usia dewasa terhadap kemampuan mengontrol hipertensi.

Istiqomah, F. et al. Pengaruh pemberian edukasi terhadap peserta prolanis perempuan di Puskesmas Brambang, Kabupaten Jombang.

Karnita and Kireina, N.P. Hubungan kadar asam urat dengan gula darah sewaktu pada lansia di Desa Mas Kecamatan Ubud Kabupaten Gianyar.

Kemenkes RI Keputusan Menteri Kesehatan Republik Indonesia Nomor HK.01.07/MENKES/4634/2021 Tentang Pedoman Nasional Pelayanan Tata Laksana Hipertensi Desawa.