

The Correlation Between Uric Acid Levels (Photometer Method) And The Incidence of Hypertension in Prolanis Patients at Puskesmas Klirong II Kebumen Regency

Budi Setyawan¹, Retno Sulistiyowati², Umi Solikhah³

^{1,2,3}Universitas Muhammadiyah Purwokerto, Indonesia

ARTICLE INFO

Keywords:

Prolanis
Uric Acid
Hypertension

ABSTRACT

Health service through Prolanis (Program Pengelolaan Penyakit Kronis or Chronic Disease Management Program in English) is a management program for health maintenance in order to achieve an optimal quality of life. One of the targets of prolanis is patients with hypertension. Hypertension can cause the blockage of uric acid crystals in blood vessels so that kidney function is disrupted. As a result, there is an increase in uric acid levels. Based on a preliminary study conducted on March 14, 2022, at Puskesmas Klirong II, it was found that 23 prolanis patients had complaints of joint pain, while 38 of them had hypertension. This research aimed to find out whether there is a correlation between uric acid levels and the incidence of hypertension in prolanis patients at Puskesmas Klirong II. The population was 50 people with a sample of 37 people. The sample was obtained by employing random sampling. This was an Analytical Observational research with a Cross-Sectional research design. The uric acid levels were checked with the Urikase-PAP photometer method. This research was conducted in May 2022. The results showed that 4 respondents had normal uric acid levels and normal blood pressure. On the other hand, there were 12 respondents who had normal uric acid levels and high blood pressure. Meanwhile, the other 21 respondents had high uric acid levels and high blood pressure. The results of the Fisher's Exact Test statistical test obtained a p-value = 0.028 < 0.05. It was concluded that there was a correlation between uric acid levels (photometer method) and the incidence of hypertension in prolanis patients at Puskesmas Klirong II, Kabupaten Kebumen.

E-mail:

retnosulistiyowati62@gmail.com

Copyright © 2022 Science Midwifery.

1. Introduction

High blood pressure or hypertension is a disease with high morbidity and mortality rates in the world. The World Health Organization (WHO) (2015) shows that around 1.13 billion people in the world have hypertension, meaning that 1 in 3 people in the world is diagnosed with hypertension. The number of people with hypertension continues to increase every year, it is estimated that by 2025 there will be 1.5 billion (Harsismanto J, 2020).

Results Based on Basic Health Research (2013) the prevalence of hypertension in Indonesia is 25.8%. The results of Riskesdas (2018) that the prevalence of hypertension was 34.1%, an increase compared to the prevalence of hypertension in 2013. The prevalence of hypertension from 34.1% in 2018 was known to be 54.4% taking medication regularly, 13.3% not taking medication and 32,3% do not take medication regularly (Kemenkes RI, 2018). This shows that some people with hypertension do not know that they are hypertension so they do not get treatment.

The prevalence of hypertension in Central Java Province is still high based on Riskesdas data for Central Java province in 2018 of 37.57%. The prevalence of hypertension by gender category in men (34.83%) in women (40.17%) higher than men Balitbangkes, 2019). Based on the profile data of the Kebumen District Health Office, the prevalence of hypertension in Kebumen Regency in 2019 was 54.6%

(Kebumen District Health Office, 2019).

Hypertension is a blood circulation system disorder that results in an increase in normal blood pressure. Say high blood pressure if the patient is <60 years old is 140/90 mmHg in the 60 year old group is 150/90 mmHg based on the diagnostic criteria of the Joint National Committee (JNC) VIII (2014) (Joint National Committee 8, 2014). an asymptomatic condition, high blood pressure in the arteries causes the risk of stroke, heart failure or heart attack (Directorate of PTM Control, Ministry of Health, 2013).

Uric acid is also associated with blood pressure. The relationship between hyperuricemia and hypertension can be seen in a body tissue process. High blood pressure / hypertension will end in microvascular disease with the end result in the form of tissue ischemia which will increase uric acid synthesis through the degradation of Adenosine Triphosphate (ATP) into adenine and xanthine (Afnuhazi, R. 2019). WHO states that patients with hyperuricemia are increasing every year in the world (Arlinda et al, 2021). The incidence of Gout in the world is around 1-4% of the general population. Patients with gout in western countries are 3-6% higher than women. The prevalence of gout in each country is different, the prevalence can increase by 10% in men and 6% in women in the age range 80 years. Gout continues to increase gradually due to poor eating habits such as the wrong diet, lack of exercise, obesity and metabolic syndrome (Ragab et al, 2017).

The results of Riskesdas Central Java Province in 2018 the prevalence of gout in Central Java has increased. The incidence of joint pain at age > 15 years is 7.2% of the total population of Central Java. Based on epidemiological survey data conducted by the Central Java Provincial Health Office in collaboration with WHO on 4683 samples aged 15-45 years, the prevalence of gouty arthritis was 24.3% (Cahyani et al, 2019).

The prevalence of gout and hypertension in the working area of the Klirong II Health Center also increases every year. Based on reports from prolanis visits at the Klirong II Health Center (2020) in 2020, gout sufferers were 16% and hypertension cases were 33% (Klirong II Health Center, 2020). Cases of gout and hypertension have increased in 2021. Based on reports from prolanis visits at the Klirong II Health Center (2021) that in 2021 cases of gout are 62.5% and hypertension cases are 78% (Klirong II Health Center, 2021). Based on a preliminary study on March 14, 2022, out of 49 prolanis patients 38 people suffered from hypertension and 23 people experienced complaints of aches in the joints. Complaints of aches in the joints often occur by several factors including rheumatic fever, inflammation of the joint tissue, side effects of drugs, gout. To ensure complaints of aches in the joints due to uric acid, then an examination of uric acid levels is carried out.

Geographical conditions will also affect the population's eating patterns (Nurhayati, 2018). The geographical condition of the Klirong II Health Center area is close to the beach. Based on data from the Klirong II Health Center Profile (2021), 10% of the population in the Klirong II Health Center work as fishermen. The Klirong II Health Center area has a fish auction place. The habit of consuming processed seafood foods that contain lots of purines will increase purine levels in the blood so that it can increase uric acid levels (Dianati, 2015).

Hyperuricemia is an increase in uric acid levels in the body. According to WHO (2020) the normal value of uric acid levels in men is 3.5 - 7.0 mg/dl and the normal value of uric acid levels in women is 2.6 - 6.0 mg/dl (Madyaningrum et al, 2020). Gout arthritis appears as a result of hyperuricemia conditions (Febriani et al, 2018). Prolonged hyperuricemia can lead to chronic kidney disease with tubular changes. Kidney function in excreting uric acid becomes impaired because the kidneys switch functions to remove excess sodium to lower blood pressure (Arlinda et al, 2021).

Gout and blood pressure if in high conditions are not treated immediately will cause severe complications and can cause death, but the numbers are still relatively low (Lumula, 2018). Based on the data, reports and preliminary studies, the researcher wants to analyze whether there is a relationship between uric acid levels (photometer method) and the incidence of hypertension.

2. Method

This type of research is Analytical Observation with a cross sectional research design. The research was carried out from March to August 2022 from the preparation of the thesis until it was ratified. Sampling examination of uric acid levels and blood pressure measurements was carried out in May 2022 at the Klirong II Health Center Laboratory, Kebumen Regency. The research was carried out after obtaining approval from the Research Ethics Commission of the Faculty of Health Sciences, University of MuhammadYesh Purwokerto with the number KEPK/UMP/07/IV/2022. Independent variables in this

study were prolans patients suffering from hypertension. The dependent variable in this study was uric acid levels in prolans patients. Respondents used prolans patients at the Klirong II Health Center. The population was 50 people and the research sample was 37 people taken by random sampling. The tool used to collect data in this study used a photometer to check uric acid, the method used was Uricase-PAP (Uricase Para Amino Phenazone). Digital sphygmomanometer is used to measure blood pressure. Data analysis used chi square statistical test with Fisher's Exact Test alternative test. The significance test in this study was carried out by looking at the p value with the following criteria: p 0.05: Ho is rejected, p > 0.05: Ho is accepted (SuprYesdi, 2014).

3. Result and Discussion

3.1 Result

a. Univariate Analysis Results (Descriptive Analysis)

1. Frequency Distribution of Respondents Characteristics (Age and Gender) in Prolans Patients at Klirong II Health Center, Kebumen Regency

Table 1

Frequency distribution of respondents' age characteristics

| Umur Responden | Amount (Person) | Presentase (%) | Average ± SD (Year) | Median (Min-Max) |
|-------------------------|--------------------|-------------------|------------------------|---------------------|
| (Middle Age) 45-59 Year | 23 | 62,2 | | |
| (Elderly) 60-75 Year | 11 | 29,7 | 59,84 ± | 58,00 (45- |
| (Old) 75-90 Year | 2 | 5,4 | 10,251 | 93) |
| (Very Old) >90 Year | 1 | 2,7 | | |

Source: Primary Data 2022

Based on table 1. it is known that the respondents with the most age are middle age (middle age) 45-59 years as many as 23 people (62.2%). The mean age of the respondents was 59.84 ± 10.251 years. The youngest respondent is 45 years old and the oldest respondent is 93 years old.

Table 2

Frequency distribution of respondents' gender characteristics

| Respondent's gender | Amount (Person) | Presentase (%) | Average ± SD | Median (Min-Max) |
|------------------------|--------------------|-------------------|--------------|---------------------|
| Man | 9 | 24,3 | 1,76 ± 0,435 | 2,00 (1-2) |
| Woman | 28 | 75,7 | | |

Source: Primary Data 2022

Based on table 2. it is known that the respondents with the most gender are female respondents as many as 28 respondents (75.7%).

2. Frequency Distribution of History of Gout and Hypertension in Prolans Patients at Klirong II Public Health Center, Kebumen Regency

Table 3

Frequency Distribution of Respondents' Gout History

| | Amount (Person) | Presentase (%) | Average ± SD | Median (Min-Max) |
|------------------------------------|--------------------|-------------------|--------------|---------------------|
| Riwayat Asam Urat | | | | |
| Ada | 12 | 32,4 | 1,68 ± 0,475 | 2,00 (1-2) |
| No | 25 | 67,6 | | |
| Mengkonsumsi Obat Asam Urat | | | | |
| Yes | 9 | 24,3 | 1,76 ± 0,435 | 2,00 (1-2) |
| No | 28 | 75,7 | | |

Source: Primary Data 2022

Table 4
Frequency Distribution of Respondents Hypertension History

| Riwayat Hipertensi | Amount (Person) | Presentase (%) | Average ± SD | Median (Min-Max) |
|------------------------|-----------------|----------------|--------------|------------------|
| Yes | 17 | 45,9 | 1,54 ± 0,505 | 2,00 (1-2) |
| No | 20 | 54,1 | | |
| Regularly Taking Drugs | | | | |
| Yes | 14 | 37,8 | 1,62 ± 0,492 | 2,00 (1-2) |
| No | 23 | 62,2 | | |

Source: Primary Data 2022

Based on table 3. it is known that respondents with a history of gout are 12 respondents (32.4%) and respondents who do not have a history of gout are 25 respondents (67.6%). Respondents who took gout drugs were 9 respondents (24.3%) and respondents who did not take gout drugs were 28 respondents (75.7%). Based on table 4. it is known that respondents with a history of hypertension are 17 respondents (45.9%) and respondents who do not have a history of hypertension are 20 respondents (54.1%). Respondents who took hypertension drugs were 14 respondents (37.8%) and respondents who did not regularly consume hypertension drugs were 23 respondents (62.2%).

3. Frequency Distribution of Respondents who feel achy in their joints

Table 5.
Frequency Distribution of Respondents who feel achy in their joints

| | Amount (Person) | Presentase (%) | Average ± SD | Median (Min-Max) |
|---------------------|-----------------|----------------|--------------|------------------|
| Feeling sore | | | | |
| Yes | 16 | 43,2 | 1,57 ± 0,502 | 2,00 (1-2) |
| No | 21 | 56,8 | | |

Sumber Data Primer 2022

Based on Table 5. respondents who feel achy as many as 16 respondents (43.2%) and who do not feel achy as many as 21 respondents (56.8%). With a mean of 1.57 ± 0.502 .

4. Frequency Distribution of Respondents Doing Physical Activities.

Table 6
Distribution of the frequency of respondents doing physical activity

| | Amount (Person) | Presentase (%) | Average ± SD | Median (Min-Max) |
|------------------------|-----------------|----------------|--------------|------------------|
| Aktivitas fisik | | | | |
| Yes | 7 | 18,9 | 1,81 ± 0,397 | 2,00 (1-2) |
| No | 30 | 81,1 | | |

Source: Primary Data 2022

Based on Table 6. respondents who do physical activity are 7 respondents (18.9%) and those who do not do physical activity are 30 respondents (81.1%). With a mean of 1.81 ± 0.397 . From the results of the percentage above, it is known that physical activity affects uric acid levels and hypertension levels.

5. Frequency Distribution of Respondents with Length of Physical Activity

Table 7
Frequency distribution of respondents with duration of physical activity

| | Amount (Person) | Presentase (%) | Average ± SD | Median (Min-Max) |
|--------------------------------|-----------------|----------------|--------------|------------------|
| Lama beraktifitas fisik | | | | |
| 1-2 time (1-2hour) | 7 | 18,9 | 1,81 ± 0,397 | 2,00 (1-2) |
| >3 time (1-2hour) | 30 | 81,1 | | |

Source: Primary Data 2022

Based on Table 7 respondents who did physical activity 1-2 times a week were 7 respondents (18.9%) and those who did physical activity >3 times a week were 30 respondents (81.1%). With a mean of 1.81 ± 0.397 .

6. Frequency Distribution of Respondents Consuming Foods That Cause Gout and Hypertension

Table 8

Frequency distribution of respondents who consume foods that cause gout & hypertension

| | Amount (Person) | Presentase (%) | Average \pm SD | Median (Min-Max) |
|--|--------------------|-------------------|------------------|---------------------|
| Mengkonsumsi makanan penyebab asam urat & hipertensi | | | | |
| Yes | 30 | 81,1 | 1,19 \pm 0,397 | 1,00 (1-2) |
| No | 7 | 18,9 | | |

Source: Primary Data 2022

Based on Table 8, respondents who consume foods that cause gout & hypertension are 30 respondents (81.1%) and those who do not consume foods that cause gout & hypertension are 7 respondents (18.9%). With a mean of 1.19 \pm 0.397. Based on the percentage above, it is known that consuming foods that cause gout & hypertension affects uric acid levels and hypertension levels.

7. Frequency Distribution of Respondents' Blood Pressure

Table 9

Frequency Distribution of Respondents' Blood Pressure

| Blood Pressure | Frekuensi (n) | Presentase (%) | Average SD (mmHg) | Median (Min-Max) (mmHg) |
|---------------------------------|------------------|-------------------|----------------------|----------------------------|
| Blood Pressure Sistolik Normal | 4 | 10,8 | 166,00 \pm 19,115 | 169,00 (128- 205) |
| Blood Pressure Sistolik High | 33 | 89,2 | | |
| Blood Pressure Diastolik Normal | 26 | 70,3 | 86,96 \pm 7,906 | 86,00 (71-100) |
| Blood Pressure Diastolik High | 11 | 29,7 | | |

Source: Primary Data 2022

Based on the results of univariate analysis, it is known that the average systolic blood pressure of respondents is 166.00 \pm 19.115 mmHg with a median of 169.00 mmHg, the smallest systolic blood pressure is 128 mmHg and the highest systolic blood pressure is 205 mmHg. Meanwhile, the respondents' mean systolic blood pressure was 86.96 \pm 7.906 mmHg with a median of 86.00 mmHg, the smallest diastolic blood pressure was 71 mmHg and the highest diastolic blood pressure was 100 mmHg. There were 4 respondents who had normal systolic blood pressure and 33 respondents who had high systolic blood pressure. Respondents who had normal diastolic blood pressure were 26 respondents and those who had high diastolic blood pressure were 11 respondents.

8. Frequency Distribution of Respondents' Uric Acid

Table 10

Frequency Distribution of Respondents' Uric Acid Levels

| Kadar Asam Urat | Frekuensi (n) | Presentase (%) | Average SD (mg/dL) | Median (Min-Max) (mg/dL) |
|-----------------|------------------|-------------------|-----------------------|--------------------------|
| Normal | 16 | 43,2 | 6,0924 \pm 1,525 | 6,350 (3,05-8,23) |
| High | 21 | 56,8 | | |

Source: Primary Data 2022

Based on the results of univariate analysis, it was found that the average uric acid level of the respondents was 6.0924 \pm 1.525 mg/dL, the median was 6.350 mg/dL, the lowest uric acid level was 3.05 mg/dL and the highest uric acid level was 8.23 mg/dL. Respondents who have normal uric acid levels are 16 (43.2%) respondents and who have high uric acid levels are 21 (56.8%) respondents

3.2 Bivariate Analysis Results

a. Chi Square Test

Table 11
Uric Acid Levels and Blood Pressure of Respondents Crosstabulation

| | | BLOOD PRESSURE RESPONDEN | | |
|----------|------------------------|--------------------------|-------|--------|
| | | NORMAL | HIGH | |
| KADAR AU | Normal Uric Acid Level | Count | 4 | 12 |
| | | % within KADAR AU | 25.0% | 75.0% |
| | High Uric Acid Level | Count | 0 | 21 |
| | | % within KADAR AU | 0.0% | 100.0% |
| Total | | Count | 4 | 33 |
| | | % within KADAR AU | 10.8% | 89.2% |

Source: Primary Data 2022

Table 12
Chi Square Test
Chi-Square Tests

| | Value | df | Asymptotic Significance (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------------------|--------------------|----|-----------------------------------|----------------------|----------------------|
| Pearson Chi-Square | 5.886 ^a | 1 | .015 | | |
| Continuity Correction ^b | 3.579 | 1 | .059 | | |
| Likelihood Ratio | 7.353 | 1 | .007 | | |
| Fisher's Exact Test | | | | .028 | .028 |
| Linear-by-Linear Association | 5.727 | 1 | .017 | | |
| N of Valid Cases | 37 | | | | |

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.73.

b. Computed only for a 2x2 table

Source: Primary Data 2022

Based on the 2x2 table, it was found that the Expected value (expected value) was less than 5, then the test used was the "Fishers Exact Test". Table 2x2 does not meet the Chi Square requirements because more than 50% have an expected count of less than five (as seen from 2 cells (50%) have expected count less than 5. The minimum expected count is 1.73). Based on the above criteria, the fisher alternative test is continued.

b. Alternative Fisher Exact Test

Table 13
Fisher Exact Test results

| | | N | Blood Pressure | | Nilai P |
|-----------------|--------|----|----------------|------|---------|
| | | | Normal | High | |
| Uric Acid Level | Normal | 16 | 4 | 12 | 0,028 |
| | High | 21 | 0 | 21 | |
| Total | | | 4 | 33 | |

Source: Primary Data 2022

Based on the results of the Fisher Exact Test, it is known that as many as 4 respondents have normal uric acid levels and normal blood pressure and as many as 12 respondents have normal uric acid levels and high blood pressure. Meanwhile, there were 21 other respondents who had high uric acid levels and high blood pressure. The results of statistical tests obtained p value = 0.028 (p < 0.05) so it can be concluded that there is a significant relationship between uric acid levels and the incidence of hypertension. H₁ is accepted that there is a relationship between uric acid levels (photometer method) with the incidence of hypertension in prolanis patients at the Klirong II Health Center, Kebumen Regency

3.3 Discussion

Characteristics of the age of respondents in the middle age is 62.2%, elderly is 29.7%, elderly is 5.7%, very old is 2.7%. The results of the analysis of gender characteristics were 24.3% male and 75.7% female. From the distribution of data obtained by respondents, the female gender is more dominant than the male gender. In this study, researchers did not analyze the sex and age factors that can affect the value of blood pressure and acid levels.

Several factors can cause high blood pressure, such as smoking habits, lack of physical activity and food consumption habits that can cause hypertension (Balitbangkes Kemenkes RI, 2013).

As many as 81.1% of respondents did not do physical exercise and 18.9% did exercise less than 3 times a week. Lack of physical activity can cause the risk of increased blood pressure / hypertension.

People who do not exercise tend to have a higher heart rate, so the heart muscle has to work harder. The pressure of the heart muscle to pump blood will be greater so that the arteries get greater pressure, this will cause blood pressure to increase (Karim et al, 2018).

The lowest diastolic blood pressure was 71 mmHg and the highest diastolic blood pressure was 100 mmHg. Respondents who have normal systolic blood pressure are 10.8% of respondents and 89.2% of respondents have high systolic blood pressure. Respondents who have normal diastolic blood pressure are 70.3% of respondents and 29.7% of respondents have high diastolic blood pressure. The results of univariate analysis showed that 89.2% of respondents suffered from high blood pressure/hypertension. Researchers assume that hypertension that occurs in prolans patients is caused by a lack of activity and eating habits that can affect blood pressure.

Most respondents consume foods that can trigger an increase in blood pressure. An unbalanced diet likes to consume coconut milk, salty foods that can trigger an increase in blood pressure (Agustina et al, 2014). Consumption of salty foods containing salt continuously can have a direct effect on increasing blood pressure (Oktavyanti et al, 2019).

The awareness of respondents who have a history of hypertension to seek treatment and control regularly is still lacking. A total of 37.8% of respondents who carry out routine control and treatment, others have not carried out routine control and treatment. Uncontrolled hypertension can attack organs and lead to heart attacks, strokes, kidney disorders and blindness (Sutarga, 2017).

Uric acid is the end product of purine catabolism (Wang et al, 2014). Excess intake of purines can cause a buildup of purine substances and result in a buildup of uric acid. Unbalanced activity patterns and eating patterns can be a risk factor for increasing uric acid levels in the blood (Arlinda et al, 2021). Eating habits that like to consume foods high in purines can cause purine metabolism disorders that trigger an increase in uric acid levels in the blood (Widyanto, 2017). As many as 81.1% of respondents have the habit of consuming foods containing purines and only 18.9% of respondents rarely have the habit of consuming foods containing purines. The increase in uric acid levels in the blood is caused by the accumulation of purine metabolism products that are less excreted through urine. Purines produced by the body reach 85% and the remaining 15% comes from the consumption of purine intake from outside the body. Some foods that contain high purines such as plants (vegetables, fruits, and nuts) or animals (meat, offal and sardines) are food ingredients that can trigger an increase in uric acid levels (Dianati, 2015).

Physical activity can affect uric acid levels. Physical activity such as exercise or physical movement can reduce the excretion of uric acid and increase the production of lactic acid in the body (Syarifuddin et al, 2019). Respondents who did not do physical activity were 81.1% and 18.9% did physical activity. According to Mayers (2003) that strenuous activity can aggravate gout or gout disease which is characterized by increased levels of uric acid in the blood. An increase in lactic acid in the blood will cause a decrease in the excretion of uric acid by the kidneys. The increase in lactic acid levels cannot be measured with certainty because we cannot be sure when the body's muscles contract anaerobically (Syarifuddin et al, 2019).

Respondents with complaints of joint pain were 43.2% and the others did not feel sore. Complaints of aches in the joints often occur by several factors including rheumatic fever, inflammation of the joint tissue, side effects of drugs, gout. In patients who have long-standing hyperuricemia, it can damage joints, soft tissues and kidneys (Widyanto, 2017).

Respondents who have normal uric acid levels are 43.24% and those who have high uric acid levels are 56.8%. Researchers assume that high uric acid levels can be caused by the habit of respondents consuming foods that contain lots of purines. Excess intake of purines will cause a buildup of purine substances and result in a buildup of uric acid. Some foods that contain high purines such as plants (vegetables, fruits, and nuts) or animals (meat, offal, and sardines) (Dianati, 2015).

The awareness of respondents who have a history of gout is still lacking to carry out routine control of gout treatment. The goal of treatment in patients with gout is to reduce pain, maintain joint function and prevent paralysis. Patients with gout who are treated early and correctly will carry a good prognosis if the patient is obedient to treatment so that uric acid can be controlled properly (Widyanto, 2017).

The results of the analysis of the frequency distribution data showed an increase in the frequency of uric acid levels and blood pressure values. Researchers analyzed the relationship between uric acid levels and the incidence of hypertension in prolans patients at the Klirong II Health Center by using the alternative Fisher Exact Test. The results of the Fishers Exact Test statistical test obtained p value =

0.028 ($P < 0.05$) so it can be concluded that there is a significant relationship between uric acid levels (photometer method) and the incidence of hypertension in prolanis patients at the Klirong II Public Health Center, Kebumen Regency. The results of this study are in line with previous research conducted by Furi OktafYesni Lumula (2018) which was shown by the Chi Square correlation test, the p value (0.003) < 0.05 . There is a relationship between uric acid levels and the incidence of hypertension in the elderly by 28.7%, the remaining 71.3% is influenced by other factors.

One of the factors causing prolanis patients to experience hyperuricemia and hypertension at the Klirong II Health Center is the habit of prolanis patients consuming pickled foods and foodstuffs containing purines. Prolanis patients who have a history of hyperuricemia or hypertension cannot control their diet. Geographical conditions will also affect the population's eating patterns (Nurhayati, 2018). The location of the Klirong II Health Center area is close to the beach and there is a fish auction place. Based on the profile data of the Klirong II Health Center (2021) as much as 10% of the population in the Klirong II Health Center area of the livelihood as fishermen. The habit of consuming processed seafood foods that contain lots of purines will increase purine levels in the blood so that it can increase uric acid levels (Dianati, 2015).

According to Feig et al (2008) there is some evidence of a relationship between uric acid levels and hypertension, namely persistently high uric acid levels are the cause of increased blood pressure. According to research Feig et al (2008) found an increase in uric acid levels as much as 25-60% in patients with essential hypertension who were not treated and 90% of adult patients with new hypertension.

The relationship between hyperuricemia and hypertension can be seen in a body tissue process. High blood pressure / hypertension will end in microvascular disease with the end result in the form of tissue ischemia which will increase uric acid synthesis through the degradation of adenosine triphosphate (ATP) into adenine and xanthine (Afnuhazi, R. 2019).

In the statistical test, it is known that the hypothesis (H_0) is rejected so that it can be concluded that the working hypothesis (H_1) of this study is accepted, namely there is a relationship between uric acid levels (photometer method) and the incidence of hypertension in prolanis patients at the Klirong II Health Center, Kebumen Regency. This research still has several weaknesses, namely:

- a. This study used a cross sectional design so that it cannot strongly explain the causal relationship between uric acid levels and hypertension.
- b. This researcher was unable to determine the relationship between uric acid levels and the incidence of hypertension on several causative factors that could affect the increase in blood pressure and uric acid levels.
- c. The results of this study can only be generalized to the study population, namely prolanis patients at the Klirong II Public Health Center, Kebumen Regency.

4. Conclusion

Based on the results of the study it can be concluded that One, Age characteristics of respondents are middle age as much as 62.2%, elderly 29.7%, elderly 5.7%, very old age 2.7%. For the analysis of the gender characteristics of the respondents, the female sex dominates as much as 75.7% and the male sex as much as 24.3%. Two, Respondents who have normal uric acid levels and normal blood pressure are 10.8%. Respondents who had normal uric acid levels and high blood pressure were 32.4%. Other respondents who had high uric acid levels and high blood pressure were 56.8%. Three, There is a relationship between uric acid levels (photometer method) and the incidence of hypertension in prolanis patients at the Klirong II Public Health Center, Kebumen Regency with statistical tests obtained p value = 0.028 ($p < 0.05$). hypothesis (H_0) is rejected. The working hypothesis (H_1) of this study is accepted.

References

- Afnuhazi, R., 2019 'Faktor - Faktor Yang Berhubungan Dengan Kejadian Asam Urat Pada Lansia (45 - 70 Year)', *Human Care Journal*, 4(1), p. 34. doi: 10.32883/hcj.v4i1.242
- Agustina.S., Sari, S.M., Reni, S., 2014. 'Faktor-Faktor yang Berhubungan dengan Hipertensi Pada Lansia di Atas Umur 65 Year', *Jurnal Kesehatan Komunitas*, 2, p.4.
- Arlinda,P.S., Putri, P., Nurwidyaningtyas, W., 2021 'Profil Karakteristik Individu Terhadap Kejadian Hiperuresemia', *Jurnal Ilmiah Kesehatan Media Husada*, 10(1), pp. 28-33. doi: 10.33475/jikmh.v10i1.244.

- Balitbangkes., 2019. Laporan Provinsi JawaTengah Riskesdas 2018. Jakarta: LPB
- Balitbangkes Kemenkes RI., 2013. Riset Kesehatan Dasar 2013. Jakarta: LPB
- Cahyani, F.D., Surachmi, F., S. E. Setyowati, S.E., 2019. 'Effect on The Decrease Intensity Gymnastics Rheumatic Pain in Patients Gout Arthritis', *Jendela Nursing Journal*, 3, p. 2.
- Dianati, N. A., 2015. 'Gout and hyperuricemia.', *Comprehensive therapy*, 36, pp. 3–13. doi: 10.1201/9781420006452-31.
- Dinas Kesehatan Kab Kebumen., 2019. Profil Kesehatan Kabupaten Kebumen. Kebumen : Dinkes Kab. Kebumen
- Direktorat Pengendalian PTM Kemenkes., 2013 *Pedoman Teknis Penemuan dan Tatalaksana Hipertensi*. Jakarta: Kemenkes RI.
- Febriani, C. F., Sutrisno and Santoni, I., 2018. 'Hubungan Antara Hiperurisemia Dengan Kejadian Hipertensi Pada Lansia', *Jurnal Kesehatan dr. Soebandi*, 6, p. 2.
- Harsismanto *et al.*, 2020. 'Kualitas Tidur Berhubungan Dengan Perubahan Blood Pressure Pada Lansia', *Jurnal Kesmas Asclepius*, 2, pp. 1–11.
- Joint National Committee 8., 2014 'Treatment of Hypertension: JNC 8 and More', Research Center, 3120 (February), pp. 209–472..
- Karim, N. A., Onibala, F. and Kallo, V. (2018) 'Hubungan Aktivitas Fisik Dengan Derajat Hipertensi Pada Pasien Rawat Jalan Di Wilayah Kerja Puskesmas Tagulandang Kabupaten Sitaro', *e-journal Keperawatan* , 6(1), pp. 1–6.
- Kemenkes RI., 2018. Laporan Nasional Riskesdas 2018. Jakarta.LPB
- Lumula, F. O., 2018. 'Hubungan Kadar Asam Urat Dengan Kejadian Hipertensi Pada Lansia Di Panti Sosial Tresna Werdha Unit Abiyoso Pakem Sleman', *Naskah Publikasi*.
- Madyaningrum., E *et al.*, 2020. *Buku Saku Kader Pengontrolan Asam Urat Di Masyarakat*. Yogyakarta: UGM (FK-KMK).
- Puskesmas Klirong II., 2020. Laporan Prolanis Year 2020 Puskesmas Klirong II. Kebumen.
- Puskesmas Klirong II., 2021. Laporan Prolanis Year 2021 Puskesmas Klirong II. Kebumen.
- Ragab, G., Elshahaly, M. and Bardin, T., 2017. 'Gout: An old disease in new perspective – A review', *Journal of Advanced Research*, 8(5), pp. 495–511. doi: 10.1016/j.jare.2017.04.008.
- SuprYesdi., 2014. *Statistik Kesehatan*. Jakarta: Salemba Medika Jakarta.
- Syarifuddin, L. A., Taiyeb, A. M. and Caronge, M. W. (2019) 'Hubungan Pola Makan dan Aktivitas Fisik dengan Kadar Asam Urat Dalam Darah Pada Penderita Asam Urat (Gout) di Wilayah Kerja Puskesmas Sabbangparu Kabupaten Wajo Relationship of Diet and Physical Activity with Blood Uric Acid Levels in Gout Patients in t', *Prosiding Seminar Nasioal Biologi VI*, pp. 372–381.
- Tim profil Puskesmas Klirong., 2020. Laporan Profil Puskesmas Klirong II Year 2020. Kebumen.
- Widyanto, F.W., 2017. 'Arthritis Gout Dan Perkembangannya', *Saintika Medika*, 10(2), p. 145. doi: 10.22219/sm.v10i2.4182.
- Wang, H *et al.*, 2014 'Association of serum uric acid with body mass index: A cross-sectional study from Jiangsu province, China', *Iranian Journal of Public Health*, 43(11), pp. 1503–1509.