URIC ACID TESTING PRACTICES IN LEBDOSARI HEALTH CENTER: PATTERNS AND CLINICAL IMPLICATIONS FOR OUTPATIENT MANAGEMENT

ABSTRACT

Background: Gout, or hyperuricemia, is a common arthritis form caused by high uric acid levels in the blood, leading to joint pain and potential disability. In Indonesia, the prevalence of gout is rising, particularly among the elderly. This study aims to assess uric acid levels in outpatient gout patients at the Lebdosari Health Center, Semarang, and investigate the relationship with age and gender. **Method**: This descriptive quantitative study used a cross-sectional approach with 51 outpatient gout patients at the Lebdosari Health Center. Data were collected using purposive sampling and uric acid levels were measured using the Easy Touch GCU Meter Device. **Results** : The results were analyzed and presented in descriptive tables. Of the 51 respondents, 80.4% had normal uric acid levels and 19.6% had high levels. Among males (29.4%), 3.9% had high uric acid levels, while 15.7% of females (70.6%) had high levels. In the age group, 9.8% of those ≤60 years had high uric acid levels, while 17.6% of those over 60 years had high levels. **Discussion & Conclusion**: The study indicates that both gender and age influence uric acid levels, with higher levels found in females and older adults. Monitoring uric acid levels, particularly in these groups, is essential to prevent gout complications. Early detection and management are crucial for controlling gout progression.

Keywords: Gout, Hyperuricemia, Uric Acid Levels, Outpatients, Lebdosari Health Center.

1. INTRODUCTION

As time progresses, a person's health quality declines in line with the individual's increasing age [1]. This is marked by the weakening of organ and tissue functions in the human body. This condition triggers the onset of various degenerative diseases, one of which is gout. Gout, or in medical terms known as hyperuricemia, is a type of rheumatic disease (arthritis) in the joints caused by abnormal levels of uric acid in the blood [2] The high levels of uric acid are influenced by the accumulation of crystals in the joints due to excessive purine intake in the blood and impaired uric acid excretion, which disrupts the purine balance in the body [3]. Uric acid, or hyperuricemia, typically affects the knee, elbow, ankle, and wrist joints, characterized by severe pain, and in chronic gout cases, it can lead to permanent physical disability [4] [5]

According to the World Health Organization (WHO) in 2017, the prevalence of gout reached 34.2%. [6] In Indonesia, the incidence of hyperuricemia ranks second after osteoarthritis, with an estimated rate of 1.6-13.6 per 100,000 people, which increases with age [7]. Data from health research indicates that the prevalence of gout arthritis in Central Java ranges from 2.6% to 47.2%. [8] The Health Department of Semarang City in 2016 reported 2,914 cases (0.18%) of gout arthritis. The composition of gout patients in Semarang City shows an increasing prevalence, with a higher number of female patients compared to males. Riskesdas report (2018), the incidence of hyperuricemia or gout in Indonesia based on medical diagnosis is 7.3%, and based on symptoms, it is 24.7%.[9].

The causes of gout, according to Passmore and Eastwood, state that hyperuricemia is influenced by two factors: the first is genetic and environmental factors such as body mass index (BMI), diet, alcohol consumption [10]. The second factor is complications arising from other degenerative diseases. Other causes of gout are also influenced by factors such as gender, age, activity, and physical condition. The aim of this study is to understand and describe the uric acid examination profile in outpatient patients at the Lebdosari Health Center, Semarang City. The benefit of writing this article is to provide information and knowledge for readers and future researchers..

2. METHOD

This study is a descriptive quantitative research with a cross-sectional approach to assess the uric acid examination profile of outpatient patients at the Lebdosari Health Center [11]. The population in this study consisted of all outpatient gout patients at the Lebdosari Health Center, with a total sample of 51 respondents. The sampling technique used was Non-Probability Sampling with Purposive Sampling [12] Data collection was performed by measuring the uric acid levels using the Easy Touch GCU Meter Device. Data collection was conducted on Tuesday, December 10, 2019, at the Lebdosari Health Center, Semarang City. The collected data will be processed, analyzed, and presented in the form of tables along with their descriptions..

3. RESULT

1. Respondent Characteristics
   a. Gender

Table 1. Respondent Characteristics by Gender

No	Gender	F	%
1.	Man	15	29.4
2.	Women	36	70.6
	Total	51	100.0

The table above shows that out of the total of 51 respondents, 15 were male (29.4%) and 36 were female (70.6%)

   b. Age

Table 2. Respondent Characteristics by Age Group

No	Age Group (years)	F	%
1.	≤ 60	26	51.0
2.	> 60	25	49.0
	Total	51	100.0

In the table above, the age of respondents is divided into two categories: ≤ 60 years and > 60 years. Among the respondents, 26 (51.0%) were ≤ 60 years old, while 25 (49.0%) were > 60 years old

2. Results of Measurements on Research Subjects

a. Distribution of Uric Acid Levels in Outpatients

Table 3. Uric Acid Levels of Respondent

No	Uric Acid Level (mg/dl)	F	%
1.	Normal	41	80.4
2.	High	10	19.6
	Total	51	100.0

Based on the uric acid level measurement using the Easy Touch GCU Meter Device, uric acid levels are categorized into two: normal and high. The reference values used (Easy Touch GCU) are 3 – 7.2 mg/dl for males and 2 – 6 mg/dl for females. It was found that 41 respondents (80.4%) had normal uric acid levels, while 10 respondents (19.6%) had high uric acid levels.

b. Distribution of Uric Acid Levels by Gender of Respondents

Table 4. Distribution of Uric Acid Levels by Gender

Gender	Uric Acid Level (mg/dl)				Total	
	Normal		High			
	N	%	N	%	Sigma	%
Man	13	25.5	2	3.9	15	29.4
Women	28	54.9	8	15.7	36	70.6
Total	41	80.4	10	19.6	51	100.0

Based on the table above, it can be seen that 2 male respondents (3.9%) had high uric acid levels, while 8 female respondents (15.7%) had high uric acid levels.

c. Distribution of Uric Acid Levels in Elderly Based on Age Groups

Table 5. Distribution of Uric Acid Levels by Age Group

Age Group	Uric Acid Level (mg/dl)				Total	
	Normal		High			
	N	%	N	%	Sigma	%

≤ 60	21	41.2	5	9.8	26	50.9
> 60	16	31.4	9	17.6	25	49.1
Total	37	72.6	14	27.7	51	100.0

Based on the distribution table above, it can be seen that among respondents aged ≤ 60 years, 5 (9.8%) had high uric acid levels. Meanwhile, among respondents aged > 60 years, 9 (17.6%) had high uric acid levels.

3. DICUSSION

Uric Acid Levels in Outpatients

Uric acid is the final product of purine metabolism, which is poorly soluble in water [13]. During normal metabolism, the digestion of protein-rich foods containing purines results in the production of uric acid, which is then excreted through feces, kidneys, or sweat. The blood can hold uric acid up to a certain level, as long as the plasma uric acid does not exceed its solubility threshold.[13] If this happens, the plasma will become oversaturated, which can cause uric acid levels to rise above the normal threshold (>7 mg/dl), a condition known as hyperuricemia.[14] The normal threshold for uric acid levels differs between men and women; for men, it ranges from 3 – 7.2 mg/dl, and for women, it ranges from 2 – 6 mg/dl.[15] Of the 51 outpatient respondents in the study, 41 individuals (80.4%) had normal uric acid levels. This is a dominant figure, considering the high number of respondents who are free from gout or hyperuricemia. Meanwhile, 10 respondents (19.6%) were diagnosed with elevated uric acid levels.

Uric Acid Levels in Outpatients Based on Gender

Based on Table 4, it is observed that male outpatient respondents had 13 individuals (25.5%) with normal uric acid levels and 2 individuals (3.9%) with high uric acid levels. Meanwhile, female outpatient respondents had 28 individuals (54.9%) with normal uric acid levels and 8 individuals (15.7%) with high uric acid levels. From this data, it can be concluded that there are more female respondents with gout compared to male respondents.

In general, men are more at risk of developing gout because they tend to have higher serum uric acid levels compared to women. However, this difference tends to equalize in both sexes after the age of 60 [16]. The data above cannot be directly compared due to the disparity in the number of male and female respondents. Another reason why women are less likely to develop gout is the presence of the hormone estrogen, which plays a role in excreting uric acid levels through urine [17]

Uric Acid Levels of Outpatient Patients Based on Age

Based on the data in Table 5, it can be seen that outpatient respondents in the age range of ≤ 60 years have a composition of 21 (41.2%) people with normal uric acid

levels and 5 (9.8%) people with high uric acid levels. On the other hand, outpatient respondents in the age group of > 60 years have a composition of 16 (31.4%) people with normal uric acid levels and 9 (17.6%) people with high uric acid levels. From this data, it can be concluded that the age group of > 60 years has the highest number of respondents with elevated uric acid levels compared to the ≤ 60 years age group.

The conclusion above aligns with the statement from Professor and joint expert Theodore Fields, MS, in the journal [18] which mentions that as the human body ages, kidney function also declines, resulting in increased uric acid levels. Another reason why age is a risk factor for gout is that the aging process can inhibit the uricase enzyme produced by the body, which is responsible for oxidizing uric acid into allantoin, making it easier for the body to excrete it[19].

4. CONCLUSION

The respondents in the outpatient uric acid examination with normal uric acid levels amounted to 41 individuals (80.4%), while 10 individuals (19.6%) had high uric acid levels.

Among the male respondents in the outpatient uric acid examination, 2 individuals (3.9%) had high uric acid levels, while 8 female respondents (15.7%) had high uric acid levels.

Among the respondents in the outpatient uric acid examination, 5 individuals (9.8%) in the age group ≤ 60 years had high uric acid levels. Meanwhile, 9 respondents (17.6%) in the age group > 60 years had high uric acid levels

SUGGESTION

For patients with gout in outpatient care, it is important to consistently follow their prescribed medical treatment and adopt a healthier lifestyle. This includes taking medication as directed, maintaining a balanced diet, and engaging in regular physical activity to help manage uric acid levels and prevent flare-ups. For the general public, it is better to prevent than to treat. Individuals should pay attention to their physical health by maintaining a healthy diet, avoiding excessive consumption of purine-rich foods, staying hydrated, and regularly exercising. Regular check-ups and early detection of high uric acid levels can significantly reduce the risk of developing gout and other related health issues.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

The authors hereby state that no generative AI tools such as large language models (ChatGPT, COPILOT, etc.) or text-to-image generators were utilized in the creation or editing of this work.

DATA AVAILABILITY

All relevant data are included in the paper and its supporting information files. This study will assist researchers in identifying critical areas for Uric Acid Testing Practices In

REFERENCES

1 W. H. Organization, *Decade of healthy ageing: baseline report*. World Health Organization, 2021.

2 N. Lusiana and E. A. R. Lainjong, "COMPARISON OF URIC ACID LEVELS IN MAN AND WOMAN AGED 45-60 YEARS," *J. Heal. Technol. Sci.*, vol. 3, no. 3, pp. 45–55, 2022.

3 U. Guha and S. Sen, *The Uric Acid Handbook: A Beginner's Guide to Overcoming Hyperuricemia (Strategies for Managing: Gout, Kidney Stones, Diabetes, Liver Disease, Heart Health, Psoriasis, and More)*. Simon and Schuster, 2023.

4 Z. Fang and H. Waizy, "Current concepts in the treatment of gouty arthritis," *Orthop. Surg.*, vol. 5, no. 1, pp. 6–12, 2013.

5 L. Punzi, A. Scanu, P. Spinella, P. Galozzi, and F. Oliviero, "One year in review 2018: gout," *Clin Exp Rheumatol*, vol. 37, no. 1, pp. 1–11, 2019.

6 A. I. Hidayatulloh, L. B. Fatimahi, and A. Rahmadiana, "Relationship Physical Activity and Eating with Gout Arthritis in Sukamaju Village," *Healthc. Nurs. J.*, vol. 6, no. 1, pp. 19–24, 2024.

7 D. A. D. Damanik and R. W. EPP, "Implementation in Providing Warm Compresses to Reduce Pain in the Elderly with Gout Arthritis at UPT Yansos Tuna Rungu and Wicara Pematangsiantar," *COVID-19 J. Heal. Med. Rec. Pharm.*, vol. 2, no. 01, pp. 54–57, 2024.

[8 D. R. Pujiastuti and F. F. Karwur, "The Relationship Between of Hyperuricemia with Hyperglycemia in Javanese Men," *J. Ilmu Kesehat. Masy.*, vol. 8, no. 3, p. 464490, 2017.

[9 D. Wulandari, "Factors Influencing Hyperuricemia: Evidence from Sukoharjo, Central Java, Indonesia," *Indones. J. Med.*, vol. 4, no. 4, pp. 321–328, 2019.

10 L. N. Helget and T. R. Mikuls, "Environmental triggers of hyperuricemia and gout," *Rheum. Dis. Clin. North Am.*, vol. 48, no. 4, pp. 891–906, 2022.

11 M. S. Fawzy and B. T. A. AlSel, "Association of Serum Uric Acid Levels with Components of Metabolic Syndrome: A Cross-Sectional Analysis in a Saudi Adult Population," *Int. J. Biomed*, vol. 10, pp. 457–466, 2020.

12 M. M. Rahman, "Sample size determination for survey research and non-probability sampling techniques: A review and set of recommendations," *J. Entrep. Bus. Econ.*, vol. 11, no. 1, pp. 42–62, 2023.

13 Y. M. Roman, "The role of uric acid in human health: insights from the uricase gene," *J. Pers. Med.*, vol. 13, no. 9, p. 1409, 2023.

14 P. Sharma, P. Singh, and A. Bhinda, "Hyperuricemia: a systemic review," *World J Pharm Res*, vol. 10, no. 01, pp. 911–922, 2021.

15 S. R. A. Moulin-Mares, D. Zaniqueli, P. R. Oliosa, R. O. Alvim, J. P. Bottoni, and J. G. Mill, "Uric acid reference values: report on 1750 healthy Brazilian children and adolescents," *Pediatr. Res.*, vol. 89, no. 7, pp. 1855–1860, 2021.
16 J. A. Singh and A. Gaffo, "Gout epidemiology and comorbidities," in *Seminars in arthritis and rheumatism*, Elsevier, 2020, pp. S11–S16.
17 G.-H. Kim and J.-B. Jun, "Altered serum uric acid levels in kidney disorders," *Life*, vol. 12, no. 11, p. 1891, 2022.
18 M. Ma *et al.*, "Meta-analysis of the correlation between serum uric acid level and carotid intima-media thickness," *PLoS One*, vol. 16, no. 2, p. e0246416, 2021.
19 Y. Kimura, D. Tsukui, and H. Kono, "Uric acid in inflammation and the pathogenesis of atherosclerosis," *Int. J. Mol. Sci.*, vol. 22, no. 22, p. 12394, 2021.