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The Effect of Uric Acid Levels on Age and Body Weight

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Abstract: High uric acid levels are a significant health problem and are influenced by various factors. This study aims to analyze the effect of age and body weight on uric acid levels in the adult population. The research method used was a quantitative and qualitative approach with direct observation techniques and questionnaires on 30 respondents aged 18 to 60 years in Bojongsoang sub-district. Measurement of uric acid levels was carried out using the Point of care testing (POCT) method. Data analysis used a correlation test to determine the relationship between variables. The results showed no statistically significant relationship between uric acid levels and body weight (p=0.328) or age (p=0.237). Although a very weak positive trend was observed, neither increasing body weight nor increasing age proved to be the main determinant of the increase in uric acid levels in this study sample. The conclusion of this study suggests that other factors such as diet, lifestyle, gender, and genetic history have a more dominant influence on uric acid levels compared to age and body weight.

Keyword: Uric Acid, Hyperuricemia, Age, Weight, Risk Factors.

INTRODUCTION

Uric acid is a nitrogenous compound resulting from the process of purine catabolism through food and nucleic acids in the body. Uric acid levels are excreted through the kidneys and partly through the gastrointestinal tract. A high increase in uric acid levels is called hyperuricemia, which can cause patients to experience pyrexia (gout). The causes of hyperuricemia are stress, lead poisoning, dehydration, diuretic use, alcohol, leukemia, kidney failure, diabetes mellitus, metastatic carcinoma, multiple myeloma, and hyperlipoproteinemia (Syukri, 2007).

In 2017, the World Health Organization (WHO) reported that the global prevalence of gout was 34.2%. In America alone, the figure is slightly lower at 26.3% of the total population. This increase in gout cases is not limited to developed countries, but is also seen in developing countries, especially Indonesia. (Putri et al., 2024) According to the Basic Health Research (Riskesdas) in 2018, the prevalence of gout in Indonesia showed an increasing trend, with the incidence rate reaching 7.3% of joint diseases. Specifically in Java,

the data shows significant variations in the prevalence of gout patients, ranging from 2.6% to 47.2% in various populations and ages (Mei & Cilongok, 2023).

In the human body, uric acid production is influenced by the balance of its excretion and production through digestion or internal body processes such as biometabolism. Normally, every human being must have certain uric acid levels (Lubis & Lestari, 2020). Excess or above normal uric acid levels will cause several diseases that are influenced by risk factors such as age, excess purine intake, alcohol consumption, obesity and lack of exercise. Among them are gout and death due to cardiovascular damage (Fajriansi & Yusnaeni, 2021) BMI or BMI is one of the factors that influence uric acid levels, this is likely due to the difficulty of measuring fat directly. (Leokuna & Malinti, 2020) According to research (Lubis & Lestari, 2020) the risk of increasing uric acid levels in overweight IMT elderly is greater than with normal IMT. In Veronica et al's research (July, 2023) shows that there is no relationship between uric acid levels and age. Based on these two articles, this article will explain the relationship between uric acid levels and body characteristics (imt and age).

METHOD

The data collection technique used is direct observation to obtain primary data from 30 individuals aged 18 to 60 years, the research implementation time is from May 28 to June 16, 2025 located in the Bojongsoang sub-district area. The methods used are qualitative and quantitative. The fundamental difference between qualitative and quantitative research lies in the nature of the data and the generalization of findings. Quantitative relies on data so that it can be measured numerically and structured. In contrast, Qualitative produces data rich in context but the findings cannot be generalized (Sihotang, 2023) Measurement of uric acid levels using the POCT (Point of care testing) tool. Tools and materials used such as 76% alcohol swab, blood lancet, and auto check tools, In addition to quantitative data, qualitative data is also carried out in the form of questionnaires regarding the habits or activities of respondents.

RESULT AND DISCUSSION

From the research conducted, there were 30 samples including variations in body weight, where the results were as follows:

Table 1. Research Result Data

Gender	Uric Acid Level	Age	Body Weight	BMI
M 1	6.8	18 years old	53 kg	17.5
M 2	6.1	18 years old	100 kg	34.6
M 3	5.6	21 years old	57 kg	19.7
M 4	8.1	21 years old	41 kg	16
M 5	7.1	21 years old	88 kg	29.7
M 6	4.8	22 years old	42 kg	15.4
M 7	6.3	22 years old	55 kg	21.2
M 8	6.5	22 years old	53 kg	18.3
M 9	5.2	22 years old	52 kg	17
F 1	5.8	25 years old	91 kg	30.1
F 2	5.9	27 years old	52 kg	20.8
F 3	3.7	42 years old	67 kg	27.5
F 4	7.9	42 years old	74 kg	26.2
F 5	5.9	43 years old	54 kg	22.2
F 6	5.4	44 years old	69 kg	28
F 7	6.4	44 years old	66 kg	25.8

Gender	Uric Acid Level	Age	Body Weight	BMI
F 8	5.8	47 years old	72 kg	26.4
M 10	7.7	49 years old	87 kg	32
M 11	7.4	50 years old	46 kg	16.9
M 12	8.7	50 years old	91 kg	31.5
F 9	7.6	51 years old	64 kg	25
F 10	7.5	52 years old	80 kg	31.6
F 11	5.9	54 years old	46 kg	21
F 12	6.8	55 years old	77 kg	36.6
M 13	8.6	55 years old	45 kg	18
F 13	4.7	57 years old	48 kg	19.2
M 14	13.7	57 years old	70 kg	25.7
M 15	6.2	58 years old	83 kg	29.8
M 16	5.9	60 years old	47 kg	18.4
F 14	5.0	60 years old	54 kg	24

Notes: M (Male) and F (Female)

Then the research data is normalized as shown in the following table

Table 2. Normalization Test

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Kadar_Asam_Urat	.130	30	.200*	.833	30	.000
Usia	.185	30	.010	.855	30	.001
Berat_badan	.172	30	.024	.931	30	.054

After the Normalization Test, the data is separated into weight and age for correlation testing.

Table 3. Age Correlation Test with uric acid levels

Correlations

		Kadar_Asam_Urat	Usia
Kadar_Asam_Urat	Pearson Correlation	1	.223
	Sig. (2-tailed)		.237
	N	30	30
Usia	Pearson Correlation	.223	1
	Sig. (2-tailed)	.237	
	N	30	30

Table 4. Correlation Test Weight with uric acid levels

Correlations

		Kadar_Asam_Urat	Berat_badan
Kadar_Asam_Urat	Pearson Correlation	1	.185
	Sig. (2-tailed)		.328
	N	30	30
Berat_badan	Pearson Correlation	.185	1
	Sig. (2-tailed)	.328	
	N	30	30

Table 5. Frequency Distribution of Respondents' Lifestyle Characteristics

Variable	Category	Frequency	Percentage
Red Meat Consumption (per week)	Rarely	26	86.7
	Frequent	4	13.3
Fatty Food Consumption (per week)	Rarely	13	43.3
	Often	17	56.7
Sleep Hours	5 - 8 Hours	30	100
Consumption of Uric Acid Triggering Vegetables	Ever	30	100

Table 6: Frequency Distribution of Respondents' Symptoms and Treatment History

Variable	Category	Frequency	Percentage
Taking Medicines	Yes	10	33.3
	No	20	66..7
Consume Caffeine	Yes	17	56.7
	No	13	43.3
Swelling	Yes	2	6.7
	No	28	93.3
Experienced joint pain	Yes	19	63.3
	No	11	36.7
Experiencing Fatigue	Yes	15	50
	No	15	50
Difficulty moving	Yes	3	10
	No	27	90

Table 1 shows the results of a study conducted on 30 respondents, divided into 16 men and 14 women with varying body weights. This data includes the age of the participants, which ranges quite wide, from 18 years to 60 years. In addition, this table shows that the highest uric acid level is at M 14 around 13.7, and the largest body range is seen at M 2 which is 100 kg. And the highest BMI was in F12 with a range of 36.6. Basically, BMI is a simple method used to assess monitor a person's nutritional status. This IMT value is

obtained from the ratio between body weight and height (Astuti et al., 2021) . From initial observations, it appears that overweight body weight tends to have higher uric acid levels. In contrast, uric acid levels at normal body weight are generally lower.

Table 2 shows the results of the normality test results of both Kolmogorov-smirnov and Shapiro-wilk. Uric acid levels are normal and can be analyzed by parametric methods, however, age and weight produce abnormalities that indicate the need to use non-parametric methods or data transformation in further analysis. This is due to the unbalanced distribution of values in the data, where the values are not around the mean value of the data.

Tables 3 and 4 of the correlation test analysis results between uric acid levels and body weight show a correlation coefficient (r) of 0.185 and a significance value (p-value) of 0.328. The correlation coefficient value of 0.185 indicates a positive relationship between the two variables, which means that there is a tendency that the higher a person's body weight, the higher the uric acid level, but the strength of this relationship is very weak. Similar to the previous results, the analysis of the relationship between uric acid levels and age also showed statistically insignificant results. A correlation coefficient value of (r) 0.223 was obtained with a significance value (p-value) of 0.237.

The most important point of this result is the significance value of $p = 0.328$. Since this value is much greater than the critical limit $\alpha = 0.05$ ($p > 0.05$), the null hypothesis (H_0) stating that there is no relationship between the two variables fails to be rejected. Thus, it can be concluded that there is no statistically significant relationship between uric acid levels and body weight in the sample population of this study. Similarly, the value of $r = 0.223$ indicated a weak positive relationship, showing the trend that uric acid levels tend to increase with age. However, with a significance value of $p = 0.237$ ($p > 0.05$), it can be concluded that there is a statistically significant weak relationship between uric acid levels and age in this study sample.

The research data in table 5 indicates that the majority of respondents (57.7%) had a high frequency of consumption of fatty foods, while all respondents reported a history of consumption of vegetables that can increase uric acid. On the other hand, red meat consumption was relatively rare in some respondents (86.7%). Research by (Zhang et al., 2012) shows that red meat intake has a positive association with increased uric acid levels. It should be noted that this diet is a major risk factor in the pathogenesis of hyperuricemia.

Table 6 shows that the most common symptom experienced by respondents was joint pain, with 19 out of 30 respondents (63.3%) reporting it. This is the most common clinical symptom of gout, caused by the buildup of monosodium urate crystals in the joints. These crystals trigger a response that results in severe pain, swelling, and redness. (Edward et al., 2025). Although joint pain was widely reported, only a small proportion of respondents (6.7%) experienced swelling and difficulty moving (10%). This could indicate that most were in the early stages of hyperuricemia. Other lifestyle factors identified were caffeine consumption (56.7%) and only a third (33.3%) of respondents were taking medication. This suggests the possibility of lifestyle influences that may lead to gout symptoms but have not been formally diagnosed or treated.

Judging by the questionnaires obtained, age and weight have little influence, there are several that affect the process of high uric acid apart from age and weight, namely diet, gender, family history and poor lifestyle. Diet greatly affects uric acid levels in the body. Most, 85%, of the purine substances that are the forerunners of uric acid are produced naturally by the body. The remaining 15% comes from food. If the intake of purines from food exceeds the 15% threshold, there will be a buildup of purines that trigger high levels of uric acid (Dian Faqih et al., 2023). Gout is caused by a combination of genetic and lifestyle factors. Just like diabetes and heart disease, gout is a multifactorial disease. This explains that

someone who suffers from gout often has family members who have the same disease (Zaq et al., 2023).

Individuals who have a hereditary history of high uric acid levels face a one to two-fold greater risk of developing a similar condition than those who do not have a genetic history. This is because uric acid levels in the body are controlled by several genes (Riswana & Mulyani, 2022). Genetic factors are one of the main causes of high uric acid levels. Nonetheless, the increase in gout cases is also greatly influenced by changes in lifestyle and diet. In addition, men tend to have higher serum uric acid levels, making them more susceptible to this condition than women (Hartono & Kusumadewi, 2023).

CONCLUSION

In this study, it can be seen that age and body weight do not affect the increase in uric acid levels. However, the increase can be influenced by other factors such as diet, lifestyle, gender, and genetic history which significantly have a greater influence. The study on 30 respondents (16 men, 14 women) found no significant relationship between uric acid levels and body weight ($r = 0.185$, $p = 0.328$) or age ($r = 0.223$, $p = 0.237$), though both showed weak positive trends. Most respondents reported frequent fatty food intake (57.7%) and vegetable consumption that could increase uric acid, while red meat intake was rare. The main symptom was joint pain (63.3%), indicating early-stage hyperuricemia, with few experiencing swelling or movement difficulties. Lifestyle factors such as diet, caffeine consumption, and limited medication use were evident. Beyond age and weight, diet, gender, family history, and lifestyle strongly influence uric acid levels. Genetic predisposition increases risk, but modern lifestyle and dietary changes also play major roles. Men are generally more susceptible due to higher serum uric acid levels.

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