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The Relationship Between Protein Consumption Patterns with Uric Acid and Cholesterol Levels

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ABSTRACT

Introduction: Uric acid is the end product of purine metabolism that deposits in tissues and can cause an increase in blood uric acid levels above normal. Increased uric acid levels can lead to disorders in the body if left unchecked. Several factors that influence the occurrence of uric acid include lifestyle factors such as physical activity, consumption patterns, and resting habits This study aimed to determine the Relationship Between Protein Consumption Patterns with Uric Acid and Cholesterol Levels.

Methods: This study used is a correlational analytic design. The population in this study consists of 70 people, and the sample used is 60 elderly individuals aged 60-74 years who meet the inclusion and exclusion criteria. Data analysis in this study used the chi-square statistical test.

Results: There is a relationship between protein consumption patterns uric acid levels and cholesterol levels in the elderly. ($p<0.000$).

Conclusion: High protein consumption patterns in the elderly are caused by the lack of variety of foods consumed. In addition, the elderly do not know the benefits or effects of the food consumed, they only know that eating a lot will make them healthy.

Keywords: Cholesterol Levels, Elderly, Protein Consumption Patterns, Uric Acid Levels.

INTRODUCTION

Uric acid is the end product of purine metabolism that deposits in tissues and can cause an increase in blood uric acid levels above normal. Increased uric acid levels can lead to disorders in the body if left unchecked. Several factors that influence the occurrence of uric acid include lifestyle factors such as physical activity, consumption patterns, and resting habits (LingQiu, 2023).

Cholesterol is the main sterol in the human body and is a structural component of cell membranes and lipoproteins. Cholesterol present in the blood binds with proteins and is transported throughout the

body. Cholesterol is essential for the body; however, if cholesterol levels in the blood are excessive, it can also be dangerous to health (Djojodibroto, 2001). Normal cholesterol levels are around 140-200 mg/dL. High cholesterol levels are 200-400 mg/dL (Yatim, 2010).

The elderly or senior citizens are individuals who have reached the age of ≥ 60 years. Entering old age, there are several problems experienced by the elderly, including physical health, psychological health, and social relationships. As a person ages, the body becomes increasingly vulnerable to health disorders and a decline in the functions of body organs. This decline in function is caused by a decrease in the number of cells anatomically, as well as reduced activity, inadequate nutrient intake, pollution, and free radicals, which result in all organs undergoing structural and physiological changes during the aging process (Putri, 2021; Yusrita et al., 2024).

According to WHO, the proportion of the elderly population in the world in 2019 reached 13.4%, and it is estimated to increase to 25.3% of the total population by 2050. Just as is happening globally, Indonesia is also experiencing an increase in the number of elderly people. According to data from the Central Statistics Agency (BPS) in 2023, the number of elderly in Indonesia reached 22.6 million people or 11.75% of the total population of Indonesia. Based on gender, 52.28% of the elderly are female, higher than the 47.72% of elderly males. The increase in the elderly population will raise health issues among the elderly. These health problems occur due to aging, which disrupts homeostasis, leading to dysfunction of various organ systems and increasing vulnerability to various diseases. One of the disrupted homeostasis is the regulation system of blood glucose levels, cholesterol, and uric acid (Bak & Tsiami, 2016; Nasir, 2017; Purwaningsih et al., 2019; Putri, 2021).

Based on a preliminary study conducted on May 11, 2024, in Jepun Tulungagung Village, it was found that out of 25 elderly people attending the elderly posyandu, there were 11 individuals (44%) who experienced conditions of excess uric acid and cholesterol, followed by various complaints such as joint pain, cramps, and tingling, with an irregular eating pattern, such as frequently consuming nuts, chicken, beef, and offal. Individuals with a history of high uric acid levels are usually advised to reduce protein consumption, both animal and plant-based, especially types of protein that contain high and moderate purine levels, such as offal, seafood, beef, tempeh, and legumes. Plant-based protein is still considered a cause of increased uric acid levels, even though it contains purines in moderate amounts, namely 50-150 mg/gram (Utami, 2020).

Other research results indicate that the habit of consuming a high-protein diet is associated with higher HDL cholesterol (Pasiakos, 2015). Dietary patterns and the composition of food ingredients are the right choices to ensure health in the body. An unhealthy diet that includes high-protein foods, especially animal protein containing high purine levels, leads to an increased incidence of uric acid. Consuming foods high in purines will increase uric acid and cholesterol levels in the blood, which predisposes individuals to excess uric acid and even gout (Ningsih, 2014).

Based on the description above, the researcher is interested in conducting research on the Relationship of Protein Consumption Patterns with Uric Acid and Cholesterol Levels in the Elderly in Tulungagung.

METHOD

The research design used in this study is a correlational analytic design aimed at determining the relationship between variables in a situation or a group of subjects. The research was conducted during the elderly posyandu activities in Jepun Village, Tulungagung Regency, which took place in August 2024. The independent variable in this study is the protein consumption pattern, while the dependent variables are uric acid levels and cholesterol levels. The population in this study consists of 70 people, and the sample used is 60 elderly individuals aged 60-74 years who meet the inclusion and exclusion criteria. The instruments used in this study include a questionnaire sheet in the form of a checklist to measure protein consumption patterns. For the examination of uric acid and cholesterol levels, an observation sheet and a uric acid measurement tool branded easy touch were used. Data analysis in this study used the chi- square statistical test. An ethics test was conducted before the research began, with results passing the ethics test.

RESULTS

Table 1 presents the demographic characteristics of the respondents. The majority of participants were 16 years old (n = 52, 73%), while 19 respondents (27%) were 15 years old. Regarding gender distribution, females accounted for 59% of the sample (n = 42), whereas males comprised 41% (n = 29). With respect to prior information related to the study topic, nearly half of the respondents had previously received information (n = 35, 49%), while 36 respondents (51%) reported no prior exposure.

Table 1. Characteristics of Respondents

Variable	n	(%)
Age		
15 years old	19	27
16 years old	52	73
Nutritional status		
Male	29	41
Female	42	59
Previous Information		
Informed	35	49
Uninformed	36	51
Total	**71**	**100%**

Table 2. Chi-square test results of Protein Cunsumption (n=71)

Variable	Statistic value	p-value
Uric Acid Level	31.75	0.000
cholesterol levels	0.000	1.000

The Chi-square analysis demonstrated a statistically significant association between uric acid levels and the studied outcome ($\chi^2 = 31.75$, df = 1, $p < 0.001$). This finding indicates that variations in uric acid levels are meaningfully related to the outcome variable. In contrast, no significant association was observed between cholesterol levels and the outcome ($\chi^2 = 0.000$, df = 1, $p = 1.000$). This result suggests that cholesterol levels did not differ between comparison groups in the present sample, indicating that cholesterol may not be a determining factor in this context.

DISCUSSION

Based on the results of statistical tests conducted, there is a proven relationship between protein consumption patterns and uric acid levels, but no relationship between protein consumption patterns and cholesterol. The results of a cross-tabulation between protein consumption patterns and uric acid levels showed that 35 respondents with a high protein consumption pattern had high uric acid levels. In a subsequent cross-tabulation conducted on protein consumption patterns and cholesterol levels, 21 respondents with a high protein consumption pattern had high cholesterol levels. Excess or deficiency of uric acid levels in the blood can cause disease in humans. If uric acid is excessive and the kidneys cannot help remove purines from the body, uric acid will crystallize and accumulate in the joints, resulting in swelling, inflammation, aches, and pain. (Savitri, 2021)

Unlike cholesterol, research has shown no correlation between protein consumption patterns and cholesterol levels. This is consistent with research conducted by Waloya et al. (2013), which found that protein intake had no significant effect on blood cholesterol levels. Consuming protein, whether from animal or plant sources, does not always increase cholesterol. However, if the protein consumed contains a lot of fat, other lifestyle factors such as overall diet, physical activity, and body weight can affect cholesterol levels.

CONCLUSION

Based on the results of research conducted on the relationship between protein consumption patterns and uric acid and cholesterol levels in elderly people in Jepun Village, Tulungagung, it can be concluded that there is a relationship between protein consumption patterns and uric acid levels, but no relationship with cholesterol in the elderly. Given the imbalance in the number of male and female respondents, recommendations for future researchers are to balance the number of male and female respondents to maximize research results.

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