


The Effect of Celery Juice and Boiled Water on Reducing Uric Acid Levels in The Elderly of Tanjung Alam

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Article Info	Abstract
<p>Article history:</p> <p>Received August 08, 2023 Revised August 27, 2023 Accepted September 22, 2023</p> <hr/> <p>Corresponding Author:</p> <p>Rindy Arabella Margareta Andika Sekolah Tinggi Ilmu Kesehatan As Syifa Kisaran, Indonesia Email: yulianalilitambunan@gmail.com</p>	<p>Background: Uric acid is the end result of the metabolism of purines in the form of nucleoproteins, which are one component of nucleic acids found in the nuclei of body cells. Celery boiled water containing apin and apigenin is believed to reduce uric acid levels naturally without causing side effects. This study aims to examine the effect of celery boiled water on reducing uric acid levels in the elderly. Purpose of the study: The purpose of this study was to identify the effect of giving celery boiled water on reducing uric acid levels in the elderly in Tanjung Alam Village. Methods: The study used pre-experiments with One Group Pretest Posttest design. Sampling technique with simple random sampling technique. The number of samples was 66 elderly people. Results: The results of statistical analysis using the Paired T-Test test. The results of the Paired T-test test on 66 elderly people showed a decrease in uric acid levels with a p-value of 0.000 ($p < 0.05$). This shows that there is an effect of celery boiled water on reducing uric acid levels in the elderly. Conclusion: Based on the results of the study, there is an effect of giving celery boiled water on reducing uric acid levels in the elderly. Giving this therapy can be used to reduce uric acid levels in the elderly by doing it regularly with 200 cc every morning.</p> <p>Keywords: Boiled Water, Celery Juice, Uric Acid</p> <p>This article is licensed under a Creative Commons Attribution 4.0 International License.</p> 

1. INTRODUCTION

Uric acid is a common issue that affects a significant proportion of the population. In fact, uric acid is a naturally occurring compound within the human body. In the absence of any underlying pathology, uric acid does not exert any deleterious effects on human health. The lack of public awareness about gout contributes to the disease becoming an acute to chronic condition [18]

Individuals who adhere to a healthy diet and lifestyle may still experience deterioration of cells due to the aging process, which can lead to the development of various diseases such as hyperuricemia, or increased uric acid levels. This is caused by a reduction in renal function, which results in a decrease in uric acid excretion in the renal tubules in the form of urine. Additionally, a reduction in uricase production, an enzyme involved in uric acid metabolism, leads to an inhibition of uric acid removal. Hyperuricemia is defined as serum uric acid levels exceeding 7 mg/dL in males and 6 mg/dL in females.

In the event that purine substances are present in excess within the body, and the kidneys are unable to effectively remove these substances, they will gradually crystallize and accumulate within the joints. Consequently, the joints will exhibit swelling, inflammation, pain, and tenderness. The big toe will initially be affected, then spread to encompass the toes and hands, wrists, ankles, heels, knees, elbows, waist, hips, back, and shoulders. Patients often report a sensation of tingling. In the event of a gout attack affecting the kidney area, the patient will experience the formation of urinary stones, which will result in difficulty urinating [18]

In 2004, the World Health Organization (WHO) estimated that approximately 335 million individuals worldwide were affected by gout (Bobaya P, Bidjuni H, 2016). A review of data on blood uric acid indicates that the number of individuals afflicted with gout increased from 2004 to 2005, with the majority of cases occurring in individuals between the ages of 40 and 59. In 2012, it was estimated that there were approximately 230 million individuals with gout worldwide. The prevalence of gout worldwide is highly variable, with epidemiological research indicating an increase in incidence, particularly in developed countries such as the USA. The estimated

prevalence is 13.6% of 100,000 population, reflecting the consumption of fatty foods and high purine levels in developed countries [21].

Meanwhile, the prevalence of joint disease based on the diagnosis of health professionals in Indonesia is 11.9%. ((Riskasdas), 2013). According to data from the BPS Data Center of North Sumatra Province, gout is one of the most prevalent diseases among the elderly. In 2007, for instance, 28% of the 4,209,817 elderly individuals in the province were affected by gout [13][7]

The initial survey conducted in Tanjung Alam Village revealed that the number of elderly individuals afflicted with gout has increased from 2021, with a total of six individuals currently suffering from this condition. In 2022, a total of 63 elderly individuals were identified as suffering from gout. In 2023, a total of 79 elderly individuals in Tanjung Alam Village were diagnosed with gout [8].

Management of gout may be approached from two perspectives: pharmacology and non-pharmacology. Pharmacological treatment of gout may be administered in the form of analgesics, non-steroidal anti-inflammatory drugs, colchine, diuretics, allupurinol, and corticosteroids during acute episodes (Brooker, 2008). Non-pharmacological management or herbal treatment has the potential to reduce uric acid levels over the long term without causing adverse side effects. One such plant with purported uric acid-lowering properties is celery leaves [2].

One such non-pharmacological therapy comprises secondary metabolite components that have been successfully isolated, including apiin and apigenin. It is established that celery has antirheumatic, sedative, diuretic, and mild antiseptic properties with regard to the urinary tract. Furthermore, celery has been demonstrated to be efficacious in the treatment of arthritis and rheumatoid conditions. Furthermore, celery is frequently employed as a therapeutic agent for conditions such as perspiration, fever reduction, rheumatism, insomnia, hypertension, gout, and impaired blood function. It functions as an anti-inflammatory (Kowalak, Jennifer P, 2012).

The simplicity of obtaining and employing celery in one's daily life lends support to its use in traditional alternative medicine for the reduction of uric acid levels (Dalimartha, 2014). Celery is readily available at a relatively low cost, which is beneficial for both the community and the environment. It is unfortunate, however, if this resource is not optimally utilized. At present, no research has been conducted to ascertain the potential adverse effects of consuming celery boiled water, which has been demonstrated to be an effective therapeutic agent for reducing uric acid levels [14]

In light of the aforementioned evidence, the researcher is interested in conducting further research on the efficacy of administering celery boiled water to reduce uric acid levels in the elderly population of Tanjung Alam Village in 2023.

2. METHOD

This type of research is a pre-experiment with One Group Pretest Posttest design. One Group Pretest Posttest, The population in this study were 79 elderly people suffering from gout in Tanjung Alam Village. The instruments used in this study were observation sheets, celery boiled water 200 cc / day and uric acid test kits using Easy Touch / GCU digital with an accuracy level in women 6.0 and men 7.0 mg / dl. In this study, the GCU tool used was new, so to get accurate results, researchers checked uric acid levels in the blood in the same two people three times every hour. The results of measuring uric acid levels in the blood get consistent results, so it can be concluded that the GCU tool can be used to check uric acid levels.

3. RESULTS AND DISCUSSION

This data presents the characteristics of respondents based on gender, age, education, and occupation.

Table 1. Characteristics by gender

No	Gender	Frequency	%
1	Man	6	10%
2	Woman	60	90%
	Total	66	100%

Table 1 shows that of the 66 respondents, most of the gout sufferers were female with a total of 60 people (90%).

Table 2. Characteristics based on age

Age	Frequency	%
60-64 years	14	21%
65-69 years	23	35%
70-74 years	19	29%
>75 years	10	15%
Total	66	100%

Table 2 shows that out of 66 respondents, the highest frequency was at the age of 65-69 years (35%), while the lowest frequency was at the age of >75 years (15%).

Table 3. Characteristics based on Education

No	Education	Frequency	%
1	Elementary	32	48%
2	Junior High School	25	38%
2	High School	9	14%
Total		66	100%

Table 3 shows that out of 66 respondents, most had elementary school education with 32 people (48%), and a small number of high school education with 9 people (14%).

Table 4. Characteristics by Occupation

No	Occupation	Frekuensi	%
1	Housewives	46	70%
2	Farmers	18	27%
2	Entrepreneur	2	3%
Total		66	100%

Table 4 shows that of the 66 studied, the majority worked as housewives (46 people (70%)), and a small proportion as entrepreneurs (2 people (3%)).

Table 5. Uric acid levels before being given celery leaf decoction water

Uric Acid Level	N	Mean	Medium	Modus	Min-Max
Before	66	7,9	7,5	6,40	6,10-13,50

Source: SPSS

Table 5 shows that uric acid levels before celery boiled water therapy were with a mean of 7.9 mg/dl, the median value was 7.5 mg/dl, for the most frequently occurring number 6.40 mg/dl, the lowest value was 6.10 mg/dl and the highest value was 13.50 mg/dl.

Table 6. Uric acid levels after being given celery leaf decoction water

Uric Acid Level	N	Mean	Medium	Modus	Min-Max
After	66	6,9	6,8	4,90	3,30-8,70

Source: SPSS

Table 6 shows that uric acid levels after celery boiled water therapy are with a mean of 5.9 mg/dl, the median value is 5.8 mg/dl, for the most frequently occurring number 4.90 mg/dl, the lowest value is 3.30 mg/dl, and the highest value is 8.70 mg/dl.

Knowing the effect of celery boiled water on reducing uric acid levels before and after given boiled water therapy in Tanjung Alam Village can be seen in the table below:

Table 7. Uric acid levels after being given celery leaf decoction water

Celery Boiled Water	Paired Diference					
	Uric Acid Levels	Mean	Std Devition	Std.Error Mean	T	p- value
- pretest - posttest		2,0	0,9	0,1	17,7	0,000

Source: SPSS

Table 7 based on the results of the Paired T-test statistical test obtained pvalue = 0.000 ($p < \alpha 0.05$) so that H0 is rejected, meaning that there is a significant effect between celery boiled water on uric acid levels in the elderly in Tanjung Alam Village in 2023.

3.1 Discussion

The results of data collection, obtained through the use of measuring instruments and observation sheets, as well as uric acid test kits utilizing the Easy Touch/GCU digital system, were analyzed in relation to the respondents' consumption of 200 cc of celery decoction water per day. The analysis revealed notable differences between the pre- and post-treatment uric acid levels.

The effect of celery boiled water is a change in uric acid levels after statistical testing using the Paired T-Test with a p-value of 0.000, which is less than the alpha value of 0.05. This indicates that the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted. It can be concluded that there is a significant effect of celery boiled water on uric acid levels in the elderly. The following section will discuss the effect of providing celery boiled water on uric acid levels in the elderly in Tanjung Alam Village in 2023.

3.1.1 Uric acid levels before celery boiled water in the elderly

The results of the research, conducted on 66 respondents in Nambangan Kidul Village, Manguharjo District, Madiun City, indicated an average uric acid level of 7.9 mg/dL in the elderly prior to the administration of celery boiled water therapy.

The mean uric acid levels observed in the respondents prior to celery boiled water therapy were above the normal range. The uric acid levels observed in this study exceeded the normal range for both women (6 mg/dL) and men (7 mg/dL). The primary cause of gout is dietary. The rate of uric acid increase can be accelerated by various factors, including dietary habits and the consumption of foods with high purine content.

As illustrated in Table 5.1, the majority of respondents with elevated uric acid levels were female (n = 60, 90%), with only 6 elderly men (10%) exhibiting this condition. The prevalence of joint disease is higher in women than in men across all age groups. However, the ratio of men and women with joint disease is similar in older age groups.

Gender is identified as a risk factor for the development of gout. In this context, men are more susceptible to developing gout. Nevertheless, the likelihood of developing gout is equally elevated in postmenopausal women. Men are at a greater risk of developing gout because their blood uric acid levels are higher than those of women. This is the reason why gout affects men more frequently. Additionally, men lack the hormone estrogen. The hormone estrogen is a hormone that is exclusively present in women. The hormone facilitates the excretion of uric acid in the urine. However, the estrogen hormone is known to decline in women who have undergone menopause, thereby increasing the likelihood of developing gout.

As illustrated in Table 5.2, the mean age of individuals diagnosed with gout is 65-69 years. As posited by Rahmatul (2015), the aging process results in the disruption of uric acid oxidation by uricase, an enzyme that transforms uric acid into allantoin. If this enzyme is not formed, uric acid levels remain stable. Age is one of the risk factors for the development of gout. This phenomenon is associated with the elevation of uric acid levels with age. Individuals over the age of 60 are susceptible to developing gout.

As evidenced by the findings presented in Table 4.4, the majority of elderly individuals afflicted with gout are homemakers, with 46 cases (70%) falling into this category. Furthermore, one's occupation influences the amount of physical activity one engages in and the time available for engaging in sports activities. Individuals suffering from gout are advised to limit strenuous physical activity.

The aforementioned discussion is in alignment with observations made during the uric acid level study, where the majority of respondents exhibited an increase in uric acid levels due to various factors, including gender, age, and occupation. These findings are consistent with the data presented in the aforementioned table.

3.1.2 Uric Acid Levels After Being Given Celery Decoction Water in the Elderly

The results of research on 66 respondents in Tanjung Alam Village after celery boiled water therapy averaged 5.9 mg/dl. Uric acid levels after being given celery boiled water on average decreased, the value of uric acid levels was lower than uric acid levels before being given celery boiled water.

In terms of the theory of Dr. Felix Adrian, (2014), celery boiled water smells aromatic, tastes sweet, slightly spicy, and is cool. (Dalimartha, 2014). Celery boiled water is efficacious as a herbal medicinal plant to overcome various diseases and health problems, one of which is as a tonic, urinary (diuretic) to remove high blood uric acid, and can cure various other diseases. This is because celery contains compounds that the body needs. For example, high sodium levels in celery are very useful for maintaining body vitality.

Previous research by Ika Prasetya (2017), which was conducted, obtained a p value = 0.002 which concluded that there were changes in uric acid levels before and after the intervention of giving celery boiled water (*Apium Graveolens L.*) which had an average decrease in uric acid levels of 2, 15 mg/dl. Celery boiled water is one of the non-pharmacological treatments in the form of herbal therapy that can help control and reduce acid levels. This study did not use a control group so that only one group was observed before and after the intervention of giving celery boiled water to uric acid levels in Tanjung Wangi Hamlet, Kubu Raya.

3.1.3 The Effect of Celery Boiled Water Therapy on Reducing Uric Acid Levels in the Elderly

Researchers prove that uric acid levels in the elderly in Nambangan Kidul Village, Manguharjo District, Madiun City have changed after being given celery boiled water as shown in table 4.6 where it is obtained that the average blood uric acid level after being given celery boiled water is very influential on uric acid levels, a Paired T-test statistical test has been carried out with a p value = $0.000 < \alpha 0.05$, this means that H_0 is rejected and H_1 is accepted, which means that there is a significant effect of celery boiled water on reducing uric acid levels in the elderly. The conclusion of this statistical test is that there is an effect of giving celery boiled water on reducing uric acid levels in the elderly in Tanjung Alam Village in 2023.

Previous research by Ika Prasetya, (2017), which said there was a decrease in celery boiled water on reducing uric acid levels in gout sufferers in the Rasau Jaya Pontianak health center work area, with the results of the study there was a difference in giving celery boiled water to reduce uric acid levels in gout sufferers. The results of the study before therapy were 9.3 mg/dl, and the results of the study after 6.7 mg/dl.

Celery boiled water therapy is a therapy that does not require a lot of funds and is very easy to find. The results conducted by researchers in May 2018 showed that there were changes in blood uric acid levels before and after giving celery boiled water therapy. Researchers applied by means of 60 grams of washed celery, leaves and stems cut into small pieces and boiled celery with 400 cc water then to 200cc. after cooling filter and then drink celery boiled water every morning after breakfast for 7 days.

The results of these differences were obtained from the results of observation sheets carried out on respondents and then analyzed using statistical tests, so that there were results of differences in uric acid levels before and after therapy with celery boiled water with an average pre test value of 7.9 mg/dl post test 5.9 mg/dl. Celery boiled water can reduce blood uric acid levels due to the content of flavonoids, saponins, and tannins which are antioxidants and inhibitors of the formation of the enzyme xanthine oxidase which eventually becomes uric acid. So that people with high blood uric acid levels need therapy by giving celery boiled water which functions as an analgesic, anti-inflammatory, and Vitamin C which can prevent gout by increasing the performance of the kidneys in removing uric acid in the body through urine.

From the results of the above studies, researchers argue that the decrease in uric acid levels in this study is due to the content of compounds that function as analgesics, anti-inflammatories, and Vitamin C which can prevent uric acid disease by increasing the performance of the kidneys in removing uric acid in the body through urine. So that people with uric acid levels need therapy by giving celery boiled water. Celery boiled water can be used as a non-pharmacological alternative therapy to reduce uric acid levels.

4. CONCLUSION

The mean uric acid level of the elderly in Tanjung Alam Village before receiving celery boiled water therapy was 7.9 mg/dL. Following the administration of celery boiled water therapy, the mean uric acid level of the elderly in Tanjung Alam Village decreased to 5.9 mg/dL. These findings indicate that celery boiled water therapy has a beneficial effect on uric acid levels in the elderly in Tanjung Alam Village.

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