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Application of Complementary Cupping Therapy for Decreased Uric Acid Levels in Gout Arthritis Patients

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Abstract

Gout Arthritis causes high morbidity and mortality rates so serious treatment is needed. Uncontrolled gout manifests as microscopic and macroscopic accumulation of monosodium urate crystals in the form of tophi, causes complications such as inflammation, damage to joints and soft tissue which can result in nephrolithiasis (kidney stones). Prevention of complications can be done with complementary pharmacological and non-pharmacological treatments, the therapy that can be used is cupping therapy. The research design uses one group pretest and posttest design. The research population was gout arthritis patients using a non-probability sampling technique using purposive sampling technique. Data analysis was carried out using Univariate and Bivariate analysis. This study aims to analyze the effect of applying complementary cupping therapy to reduce uric acid levels in gout arthritis sufferers. Based on the research results, it shows that the significance value is 0.000, the p value <0.005, it is concluded that there is an effect of cupping on reducing uric acid levels in gout arthritis sufferers.

Background

Gout arthritis is an inflammatory joint disease characterized by the buildup of monosodium urate crystals in the body or around the joints. Monosodium urate is obtained from increased purine metabolism, so when uric acid levels in the blood continue to increase until they exceed the saturation threshold of body tissue, gout arthritis manifests as a microscopic and macroscopic buildup of monosodium urate crystals in the form of tophi (Marlinda & Putri, 2019). Gout arthritis forms if the body consumes foods that contain lots of purine. Uric acid levels increase or are abnormal when the kidneys are unable to excrete it through urine, which can cause pain (Rahayu et al., 2022).

Based on data from the National Center for Health Statistics under the auspices of the World Health Organization, it is estimated that the incidence of gout arthritis is 34.2% in developing countries and 26.3% of the incidence of gout arthritis in developed countries (WHO, 2019). The results of Basic Health Research (Riskesdas) in 2018 showed that the prevalence of joint disease in Indonesia was 7.30%. The highest prevalence of joint disease based on health diagnosis was aged 75 years and over (18.9%), and in the 15–24 year age group, it was (1.23%). The prevalence of disease based on gender is higher in women (8.46%) than in men (6.13%). The prevalence of cases of joint disease in Central Kalimantan Province in 2018 was 179,200 cases (Riskesdas, 2018). Based on data from the West Kotawaringin District Health Service in 2023, from January to September, there were 376 cases.

Excessive uric acid levels in the body can cause a buildup of uric acid in the tissues, which will then form crystals. This condition can cause inflammatory damage to joints and soft tissue, which can result in nephrolithiasis (kidney stones). The impact is joint pain and swelling, which, in the long term, can cause permanent joint damage. High uric acid can cause complications of heart disease, kidney stones, and high blood pressure. Pain is caused by the formation of monosodium urate monohydrate (MSUM) crystal deposits (Rahmawati & Kunsul, 2021). So appropriate management is needed, both pharmacological and non-pharmacological.

Management of gout arthritis includes controlling uric acid levels, pain, joint damage, and increasing and maintaining daily activities. Pharmacological treatment of gout arthritis uses non-steroidal anti-inflammatory drugs (NSAIDs) to relieve pain and joint inflammation, xanthine oxidase (IXO) inhibitors, and the use of uricosuric drugs to suppress the development of gout arthritis (Widodo, S., & Mustofa, A. 2017). Currently, many people like complementary therapies among the public because they are relatively affordable, lack chemicals, and the healing effect is quite significant. One of the complementary therapies that can treat gout is cupping therapy (Syahirah, S., & Airlangga, E. 2021).

Cupping therapy is a method of treating various diseases that can stimulate general blood circulation in the body through nitric oxide (NO), which plays a role in expanding blood vessels and causing a decrease in blood pressure. If cupping therapy is carried out at one point, the skin (cutis), subcutaneous tissue (subcutis), fascia, and muscles will activate mast cells to release several substances such as serotonin, histamine, baradikinin, Slow-Reaching Substance (SRS), and other unknown substances (Sucipto et al., 2023). These substances cause dilation of capillaries and arterioles as well as flare reactions in the area being cupped (Rochman N et al., 2020).

Based on research results (Sumartini, R., 2021), there is a difference in the average uric acid levels before and after wet cupping; the pretest average is 9.7 mg/dl, and the posttest average is 4.9 mg/dl. Cupping is able to reduce uric acid levels through detoxification, excretion, homeostasis, and organ stimulation. This causes improvements in blood vessel microcirculation, which results in a relaxing effect on the muscles in the kidneys, which will reduce uric acid levels by distributing purines through urine. The novelty of this research is the application of a complementary intervention of cupping therapy to reduce uric acid levels in gout arthritis sufferers using cupping points carried out at the Kaahil point (neck), both shoulders and the back area, uric acid points on the back of the palms, uric acid points on the feet, namely Zhohrul Qodam (on the back of the foot), and Iltiwa' point (under the inner ankle). Preliminary studies in the Sungai Rangit Community Health Center Work Area show that people who experience gout arthritis only take medication and do not understand the pharmacological interventions, one of which is cupping. From the description of these phenomena and problems, researchers are interested in examining the intervention of applying complementary cupping therapy to reduce uric acid levels in patients with gout arthritis.

Methods

This research is a type of experimental research in the form of a pre-experimental research design, namely a one-group pre-test-post-test design. In this design, there is a pretest by measuring the respondent's uric acid level before being given treatment and a posttest by measuring the uric acid level again after being given cupping treatment. Cupping therapy was carried out by the main researcher (Ns.Ade Sucipto., S.Kep.M.Tr.Kep), who had undergone training and had a cupping certificate. Cupping treatment is carried out for 15 minutes according to the specified point. After that, the researchers measured uric acid levels using a digital uric acid detection strip (Easy Touch GCU 3 in 1). Data analysis was carried out using univariate and bivariate analyses.

The research was conducted in the Sungai Rangit Community Health Center Working Area over a month's research period. The research population was gout arthritis patients who experienced hyperuricemia using a non-probability sampling technique, namely purposive sampling using inclusion and exclusion criteria, totaling 30 respondents. Researchers have applied for a research permit at the Sungai Rangit Community Health Center. Respondents were given information regarding the objectives and procedures of the research to be carried out, then asked to become research respondents by signing an informed consent sheet.

Results and Discussion

The following is a description of research results related to the application of complementary cupping therapy to reduce uric acid levels in Gout Arthritis patients:

Table 1. Frequency Distribution of Respondent Characteristics by Age, Gender and Education

No	Gender	Frequency (f)	Percentage (%)
1.	Female	7	20
2.	Male	28	80
	Total	35	100
No	Education	Frequency (f)	Percentage (%)
1.	SD	10	28,6
2.	SMP	8	22,9
3.	SMA	13	37,1
4.	Undergraduate	4	11,4
	Total	35	100

Based on table 1, it shows that the average age of respondents is 55 years. Age is one of the factors that influences gout. As a person gets older, if a person consumes more protein, it will result in the accumulation of purines in the blood. This is in accordance with the statement (Riswana, I., 2022) that as age increases, various organs and cells tend to experience functional decline because the aging process begins to appear at the age of >40 years. One of the organs that experiences a decline in function is the kidneys, where there is a decrease in filtration, reabsorption and excretion in the kidneys. A decrease in the kidney's ability to excrete uric acid causes uric acid levels in the blood to increase.

Of the 35 respondents, the majority of those who experienced gout arthritis were men, 28 people (80%). The results of several studies show that men have higher serum uric acid levels than women, which increases the risk of developing gout arthritis. However, research results (Rusman, A., 2021) state that gout arthritis can occur in women and the risk increases after experiencing menopause. After entering menopause, women experience a decrease in the production of the hormone estrogen. The hormone estrogen acts as a uricosuric agent, which is a chemical substance that functions to help increase the excretion of uric acid through the kidneys.

Data description in table 1. Shows the education level of the respondents, mostly high school, 13 people (37.1%). The results of research (Songgigilan et al., 2019) explain that education can influence the learning process, the higher a person's education, the easier it is for that person to receive information, both from other people and from the mass media, so that education influences a person's level of knowledge. According to researchers, most of the responses did not understand a good diet for gout arthritis sufferers. Poor or irregular eating patterns such as consuming fast food, alcoholic drinks, especially consuming foods that contain high purines too often can affect uric acid levels in the blood.

Table 2. Uric Acid Levels of Respondents Before and After Cupping Treatment

Uric Acid Levels	Treatment	Min	Max	Mean
Normal (3-7 mg/dL)	Pre Cupping	6.2 mg/dL	9.8 mg/dL	7.7 mg/dL
	Post Cupping	4.4 mg/dL	7.6 mg/dL	5.9 mg/dL

From the description in Table 2, it shows that there are differences in the uric acid levels of respondents before and after being given the complementary cupping intervention. In the pretest, the uric acid level of 35 respondents was a minimum of 6.2 mg/dL and a maximum of 9.8 mg/dL. After being given cupping, the minimum value for the respondent's uric acid level was 4.4 mg/dL and the maximum value was 7.6 mg/dL. Based on the observation results, the causes of high pretest uric acid levels in respondents included food, where the respondents in this study on average ate food in the form of sardines, anchovies, shrimp, chicken, chicken liver, kale, spinach, soybeans and peanuts. Diet is a way of regulating the amount and type of food with a specific purpose. By regulating a person's diet, someone can help maintain health, nutritional status and prevent or assist in the healing process of disease. A person's eating pattern can be seen through the amount, frequency, type, function and method of processing the food (Marnata et al.,2023).

In the measurement of posttest uric acid levels, there was a decrease due to cupping treatment for 20 minutes. Cupping therapy can reduce uric acid levels in the blood, namely through stimulation of the skin in the form of touch, massage, incisions with a cupping knife or lancet which will cause mast cells to release several substances such as serotonin, histamine, bradykinin, slow reacting sub stance (SRS). Histamine is useful in the process of repairing

diseased cells, is anti-inflammatory, and stimulates the formation of reticulo endothelial cells, which will increase the body's resistance and immunity (Firdaus F et al.,2023). On the other hand, various substances released as a result of the cupping mechanism cause dilation of capillary blood vessels. This reaction causes improvements in blood vessel microcirculation which triggers a relaxing effect on stiff muscles and improves kidney function, so that uric acid in the blood can be excreted through the kidneys (Tirtana A et al.,2023).

Apart from that, the effect of cupping therapy on gout is that cupping can remove uric acid crystals from the joints and surrounding tissue, so that pain is reduced and there is no inflammation, redness or swelling in the joints. Cupping via nitric oxide (NO) functions to reduce swelling of painful joints, cupping removes prostaglandins from the painful area thereby reducing pain, besides that, cupping triggers the secretion of endophrins and enkephalins in the body which function as natural pain relievers. Cupping therapy can reduce uric acid levels, because with cupping substances that are harmful to the body can be removed (Azkiya, A.,2022).

According to the researchers' assumption, the decrease in uric acid levels occurred because the respondents did cupping therapy 2-3 times a month and adjusted their diet so that uric acid levels which were previously high decreased and there was no increase in uric acid levels in sufferers (hyperuricemia).

Table 3. Analysis of the Effect of Complementary Cupping Therapy on Uric Acid Levels

Uric Acid Levels	Treatment	Mean	Difference	Sig
Normal (3-7 mg/dL)	Pre Cupping	7.7 mg/dL	1.8 mg/dL	0.000
	Post Cupping	5.9 mg/dL		

Based on table 3, it shows that there is a significant difference in the mean decrease in uric acid levels in the pretest and posttest. The mean uric acid level of respondents before being given cupping treatment was 7.7 mg/dL and posttest 5.9 mg/dL. The difference between the pretest and posttest means was 1.8 mg/dL, with a significant p value of 0.000, which means that there was an effect of applying complementary cupping therapy on reducing the respondents' uric acid levels.

The reduction in uric acid levels was higher in respondents who were given complementary cupping interventions. Cupping is done at the Kaahil point (neck), both shoulders and the back area at the level of the right and left kidneys. This is intended to remove toxins and other metabolites (uric acid, cholesterol, etc.) which have been damaged and become waste that is destructive for the body (Putri, A.,2019). Apart from that, based on the results of research (Ningsih N F.,2017) it also aims to improve kidney function so that it can better metabolize and dispose of excess uric acid, uric acid points on the back of the palms, uric acid points on the feet if complaints occur in the feet. Because it contains salt compounds, uric acid often settles

in the feet. So the cupping point is Zhohrul Qodam (on the instep). And another cupping point is the Iltiwa' point (under the inner ankle).

According to the researchers' assumptions, the decrease in uric acid levels in the posttest occurred because respondents carried out cupping therapy 2-3 times a month, controlled food intake so that uric acid levels which were previously high decreased and there was no increase in uric acid levels in respondents (hyperuricemia). On the other hand, respondents also did light exercise every day for at least 15 minutes. This condition helps to improve the body's metabolism. By doing activities such as exercise, you can improve blood circulation, supply the kidneys so that the kidneys can function optimally in removing waste substances from the body. So that the purine content can be removed and uric acid levels can automatically decrease.

Conclusion

From the results of the research it can be concluded that there is an effect of applying the complementary intervention of cupping therapy on reducing uric acid levels in gout arthritis sufferers using cupping points carried out at the Kaahil point (neck), both shoulders and the back area, uric acid points on the back of the palms, uric acid points on the feet, namely Zhohrul Qodam (on the instep) and Iltiwa' point (under the inner ankle). And it was concluded that apart from pharmacological management using drugs, uric acid levels can be reduced by non-pharmacological methods such as cupping applying, adjusting diet and eating patterns, doing activities and exercise as well as other supporting factors that can be applied by respondents to reduce and control the occurrence of increased uric acid levels.

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