

Ergonomic Exercises to Lower Uric Acid Levels in the Elderly with Gout

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ABSTRACT

Ergonomic gymnastics is a practical and effective method to maintain a healthy body. The movements contained in ergonomic gymnastics are movements that are very effective, efficient, and logical because they use a series of movements that have been carried out by humans from the past until now. Ergonomic gymnastic movements are in accordance with the rules of body creation, and are inspired by the "prayer" movement in Islam. This study aims to determine the effect of ergonomic exercise on uric acid levels in the elderly with gout at "Rumah Bahagia Bintan", Indonesia. The design of this research was one group pretest-posttest. Research respondents were 16 elderly who were selected by total population sampling technique. In the phase before and after the intervention, blood uric acid levels were measured. Furthermore, the data were analyzed by paired sample t-test. The results of the analysis showed that the p value = 0.003, so it was interpreted that there was a difference in uric acid levels between before and after ergonomic exercise. Furthermore, it was concluded that ergonomic exercise was effective in reducing blood uric acid levels in the elderly with gout.

Keywords: elderly; gout; blood uric acid; ergonomic exercise

INTRODUCTION

Gout is a relatively dominant health problem in many countries, although the global prevalence of gout has not been recorded. The prevalence of gout is about 2.6-47.2% which varies in various populations, while the prevalence of gout also varies from 1-15.3% ⁽¹⁾. Research in Taiwan in 2005-2008 showed that there was an increase in the incidence of gout in elderly women by 19.7% and the prevalence of gout in elderly women by 23.3% ⁽²⁾. Gout is an acute inflammatory disorder characterized by pain due to accumulation of monosodium urate crystals in joints and soft tissues in the body ⁽³⁾. Gout is characterized by an increase in uric acid levels >7 mg/dL in men and >6 mg/dL in women ⁽⁴⁾.

Gout is mostly experienced by the productive age group ⁽⁵⁾. High levels of uric acid in the blood cause gout which is one of the various types of arthritis. In Indonesia, gout ranks second from arthritis ⁽⁶⁾. This condition is triggered by an increased intake of purine-rich foods, and a lack of fluid intake (water), so that the elimination process through the kidneys decreases ⁽⁷⁾. If intake and diet are not changed, then excessive uric acid levels in the blood will cause a buildup of uric acid crystals. If the crystals are in the joint fluid, gout will develop ⁽⁸⁾. Gout can interfere with the comfort of the elderly in their activities due to joint pain. It can also cause a high risk of complications such as urolithiasis, acute uric acid nephropathy ⁽⁹⁾. These complications need to be evaluated to explain the cause and get the appropriate treatment ⁽¹⁰⁾. Based on the various impacts, gout needs appropriate and safe treatment, both pharmacologically and non-pharmacologically ⁽¹¹⁾.

The results showed that pharmacological therapy for gout should be minimized because it can cause dependence and also has contraindications. Thus, non-pharmacological therapy is preferred in order to prevent and reduce clinical complaints of gout ⁽¹²⁾.

Non-pharmacological therapy can be done in various ways such as relaxation, exercise, increasing fluid intake, warm compresses, low-purine diet (such as nuts and organ meats), maintaining body weight, and exercising ⁽¹³⁾. Exercise is an effective way to lower uric acid levels. Twenty minutes of exercise per day is highly recommended to keep the body in shape and lower uric acid levels ⁽¹⁴⁾. Exercise is also very necessary to prevent or delay degenerative diseases and metabolic disorders ⁽¹⁵⁾.

There needs to be efforts both in terms of care, treatment, healthy lifestyle and also other efforts, such as elderly gymnastics to maintain health ⁽¹⁶⁾. Physical activity for each elderly is different, adjusted to their physical condition. Regular exercise can improve joint strength and flexibility and reduce the risk of joint damage due to arthritis ⁽¹⁷⁾. Exercise can also warm the body so that pain can be reduced, as well as the deposition of uric acid in cold parts of the body due to a lack of blood supply ⁽¹⁸⁾. The application of exercise must pay attention to the safety of the elderly, which should be done regularly 3-4 times a week with a duration of 15-45 minutes. Some

examples of sports that can be done by the elderly are walking, reactive sports and gymnastics. Gymnastics is very useful to avoid the accumulation of fat in the body ⁽¹⁹⁾.

Some of the exercises that can be done by the elderly are 10 minutes of exercise, Kegel exercises, yoga, taichi and ergonomic exercises ⁽²⁰⁾. Ergonomic exercise also maximizes oxygen supply to the brain, opens the intelligence system, sweat system, body heating system, combustion system (uric acid, cholesterol, blood sugar, lactic acid, oxalate crystals), carbohydrate conversion system, electrolyte making system in the blood, freshness system body and immune system from negative energy / virus, negative energy removal system from the body. Ergonomic gymnastics consists of movements that resemble prayer movements according to Islam, so that the elderly can easily apply them in everyday life ⁽²¹⁾. Research conducted by Gayatri ⁽²²⁾ regarding the effect of ergonomic exercise on changes in blood pressure in Bendan, Pekalongan, Indonesia shows that there is an effect of ergonomic exercise on changes in blood pressure. Rahmawati (2013) reported that there was an effect of ergonomic exercise on the sleep quality of the elderly ^(23,24).

Based on a preliminary study conducted at Rumah Bahagia Bintan, the number of elderly women is 25 people and elderly men are 10 people. Women with high uric acid levels are 10 people, with gout sufferers are 2 people. Meanwhile, men with high uric acid levels are 5 people. Thus, it is necessary to conduct a study that aims to analyze the effect of ergonomic exercise on blood uric acid levels in the elderly at "Rumah Bahagia", Bintan.

METHODS

The design of this research was one group pretest-posttest. This study involved the elderly with gout in "Rumah Bahagia Bintan", Indonesia with a population size of 16 elderly. The sample was selected using a total population sampling technique, with inclusion criteria: elderly with high uric acid levels, and exclusion criteria: elderly who died during the study. Measurement of blood uric acid levels was carried out in the pre-intervention phase (ergonomic exercise) hereinafter referred to as the pretest, also in the post-intervention phase, hereinafter referred to as posttest. Differences in blood uric acid levels between pretest and posttest were tested using paired sample t-test. Health research ethical considerations have been taken into account in this study.

RESULTS

The results of data analysis showed that the average uric acid level before ergonomic exercise was 6.22 g/dL; while after the intervention was 5.91. Thus there has been a decrease in blood uric acid levels. The p value = 0.003 so it can be interpreted that the difference between the two numbers is significant. Thus it can be said that there has been a significant decrease in blood uric acid levels after ergonomic exercise in the elderly.

Table 1. The results of paired sample t-test

Phase	Mean	p-value	Difference
Pretest	6.22	0.003	Significant
Posttest	5.91		

DISCUSSION

This study involved 16 elderly consisting of 6 men and 10 women. After measuring blood uric acid levels on the first day (pretest), then doing ergonomic exercises for 14 days, then measuring blood uric acid levels (posttest). The results of the analysis show that in the posttest phase there has been a significant decrease in blood uric acid levels as a result of ergonomic exercise in the elderly, so that the intervention is an effective non-pharmacological way to reduce blood uric acid levels in the elderly. High levels of uric acid can occur due to the aging process, especially in women who have entered menopause, namely at the age of 45-60 years. At this age, gout is more common. For men, gout usually affects those aged 30-40 years. The older the age of the male, the higher the prevalence of this disease ⁽²⁵⁾.

Shetty (2011) reported that there was a positive relationship between blood uric acid levels and age, namely in the age group of 30-40 years in both men and women ⁽²⁶⁾. According to Carlioglu (2011), the average age of gout sufferers in women is 51 years, while in men it is 30-59 years ⁽²⁷⁾. Meanwhile, according to Doherty (2009), gout is more common in men than women with a ratio of 4:1 for those under the age of 65; while the ratio for over 65 years is 3:1 ⁽²⁸⁾.

CONCLUSION

Based on the results, it was concluded that ergonomic exercise was effective in reducing blood uric acid levels in the elderly with gout.

REFERENCES

1. Anugrah. Pengaruh senam ergonomis terhadap tekanan darah (hipertensi) pada penderita DM tipe 2. 2010.
2. Bosco JS, Greenleaf JE, Kaye RL, Averkin EG. Reduction of serum uric acid in young men during physical training. USA: Physical Education Laboratory and Student Health Service" San Jose State College; 1970.
3. Chuang SY, Lee SC, Hsien. Hyperuricemia and gout prevalence: nutrition and health survey in Taiwan from 1993-1996 to 2005- 2008. *Asia Pac Clin Nutr*. 2011;20(2):301-8.
4. Dincer HE, Dincer AP, Levinson DJ. Asymptomatic hyperuricemia to treat or not to treat. *Cleveland Clinic Journal of Medicine*. 2002;69(8):594-608.
5. Depkes RI. Pedoman pelatihan kader kelompok lanjut usia bagi petugas kesehatan. Jakarta: Direktorat Kesehatan Keluarga Kemenkes RI; 2006.
6. Doherty M. New insights into the epidemiology of gout [Internet]. 2009 [cited 2014 May 17]. Available from: <http://rheumatology.oxfordjournals.org>
7. Edward NL. Gout: clinical features. In: Klippel JH, Stone JH, Crofford LJ, WhitePH, Editors. 3ed. New York: Springer; 2008.
8. Enneking WF, et al. Clinical musculoskeletal pathology seminar. Florida: University of Florida Orthopaedic Association; 2009.
9. Fauzia Y. Hubungan indeks masa tubuh dan usia dengan kadar asam urat pada remaja pra-obese dan obese di Purwokerto. Purwokerto: UNSOED; 2013.
10. Fajarina E. Analisis pola konsumsi dan pola aktivitas fisik dengan kadar asam urat pada lansia wanita peserta pemberdayaan lansia di Bogor. Bogor: IPB; 2011.
11. Festy PHAR, Aris A. Hubungan antara pola makan dengan kadar asam urat darah pada wanita postmenopause di posyandu lansia Wilayah Kerja Puskesmas Dr. Soetomo Surabaya. Surabaya: Fakultas Ilmu Kesehatan UM Surabaya; 2010.
12. Gayatri S. Pengaruh senam ergonomis terhadap perubahan tekanan darah pada klien hipertensi di Kelurahan Bendan Kota Pekalongan. 2012.
13. Hawkins DW, Rahn DW. Gout and hyperuricemia, pharmacotherapy: a pathophysiological approach. McGraw-Hill; 2005.
14. Hidayat R. Gout dan hiperurisemia. *Medicinus*. 2009;22.
15. Juandy. Gout and diet. Jakarta: Depkes RI; 2007.
16. Junaidi I. Rematik dan asam urat. Jakarta: PT Bhuana Ilmu Populer Kelompok Gramedia; 2012.
17. Johnstone A. Gout-the disease and non-drug treatment. *Hospital Pharmacist*. 2005;12:391-394.
18. Kertia N. Asam urat. Yogyakarta: Bintang Pustaka; 2009.
19. Krisnatuti RY. Perencanaan menu untuk penderita gangguan asam urat. Jakarta: Penebar Swadaya; 2006.
20. Marwoto J. Pengenalan macam-macam senam dan manfaatnya. Semarang; 2008.
21. Misnadiarly AS. Mengenal penyakit arthritis. *Mediakom*. 2008;2:57.
22. Nafifah H, Kurniawati I, Rusmiana A, Wirotomo TS. Pengaruh senam 10 menit terhadap skala nyeri pada penderita gout di wilayah kerja Puskesmas Jenggol Kota Pekalongan. 2013.
23. Rahmawati L. Pengaruh terapi aktivitas senam ergonomis terhadap kualitas tidur pada lansia di Posyandu Lansia Harapan I dan II Kelurahan Pabuaran. 2013.
24. Rudy S, Sergen JS, editors. Kelley's textbook of rheumatology. Philadelphia: Saunders; 2013.
25. Sagiran. Mukjizat gerakan sholat. Jakarta: Qultum Media; 2012.
26. Sani A, Winarsih. Perbedaan efektifitas kompres hangat dan kompres dingin terhadap skala nyeri pada klien gout di Wilayah Kerja Puskesmas Batang III Kabupaten Batang. PKJ: STIKesMuh PKJ; 2013.
27. Sari M. Sehat dan bugar tanpa asam urat. Araska Publisher; 2010.
28. Shetty S, Bhandary RR, Kathyayini. Serum uric acid as obesity related indicator in young obese adults. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*. 2011;2(2):1-6.