

## Correlation between Regular Ling Tien Kung Exercise and Uric Acid Level in the Elderly

Lingling Marinda Palupi<sup>1</sup>, Ira Rahmawati<sup>2</sup>, Lucia Retnowati<sup>3</sup>

<sup>1,2,3</sup> Nursing Department, Poltekkes Kemenkes Malang, Indonesia

### Abstract

Aging causes physiological changes in all organs in the human body which resulted in body weakness, physical declines and the emergence of age-related conditions such as increased uric acid levels that can cause complications including kidney stones, gout, and rheumatism. Efforts should be encouraged to improve physiological functions in the elderly. These can be a form of care, treatment, healthy lifestyle, or other efforts, such as physical activity. Ling Tien Kung is one of the physical exercises that can be carried out by the older people. The purpose of this study was to determine the correlation between Ling Tien Kung's routine and uric acid levels in the elderly. This study used a cross sectional study design. The Ling Tien Kung interventions was carried out once a week, for 45 minutes for two months. Twenty-five respondents were involved in this study. The sampling technique for selecting respondents was non-probability sampling with a purposive sampling method. Data was analyzed using the Pearson Correlation test. Although the statistical analysis showed that there were no significant correlations between a regular Ling Tien Kung exercise and uric acid levels, some respondents have a lower uric acid level at the end of the study. This may happen because the physical exercise that only be done once a week is not optimal for transporting all the body's metabolism which should then be excreted through the kidneys.

**Keywords:** ling tien kung; elderly; uric acid; gout

### Backgrounds

Aging causes body cells to change and lose ability to function properly which then resulted in the organ weakness and decreased physical strengths. Elderly people are also at risk for age related conditions including an increase in the uric acid levels that can cause several complications such as kidney stones, gout and rheumatics (Efendi and Makhfudli, 2009). High levels of uric acid in the blood will cause the accumulation of uric acid crystals in joints, the kidneys and other organs (Safitri, 2012). In the Elderly, the increase of uric acid levels in the body may cause many other conditions such as metabolic disturbances and contribute to the death caused by cardiovascular diseases, hypertension, diabetes mellitus and hypercholesterolemia (Rukmini and Kristiani, 2021).

In 2020, there were about 27.1 million of elderly people around the world. It is estimated that, in 2025 the number will increase to 33.7 million and continue to increase to 48.2 million in 2035. The number of elderly women are higher than the man, which around 10.77 million and 9.47 million respectively (Badan Pusat Statistik, 2014; Krisnatuti et al., 2008). In Indonesia the incidence of gout is 840 per 100.000 persons. The incidence of gout in younger adult is also increasing that is 34% of male age below 34 years old. In women, the risk of gout will increase after menopause as estrogen hormones will become inactive during menopause (Ninsi et al.; Soeroso J, 2012).

There are two possible causes of increased uric acid levels in the blood, an increase of the amount of uric acid being produced and a decrease in the excretion of the substance out of the body. The normal uric acid level in the blood ranges from 3.5 – 7.0 mg/dl for male and 2.6 – 6.0 mg/dl for female. Uric acid has been identified for more than two centuries, but some pathophysiological effects of this substance remain unclear (Puddu et al., 2012). One of the exercises that may be used to help decreasing uric acid level in the blood is Ling Tien Kung Ling Exercise which is a series of movement techniques that activate natural healing energy (Ningrum et al., 2019). This exercise focuses on stretching that will stimulate chi energy to decrease Adrenocorticotropin hormone released by pituitary anterior. A study conducted in 2019 showed that this exercise reduced uric acid levels among the respondents. This study was one group pre-test post-test study involving twenty elderly people and found that there was a correlation between regular Ling Tien Kung exercise and a lower uric acid level in the blood (Rismawati, 2019). Similarly, a research conducted in 2013 in Surabaya East Java showed that Ling Tien Kung Exercises may lower uric acid levels in older people (Palupi and Widiani, 2019).

Optimizing Body Metabolisms is necessary for geriatric patients which can be achieved by performing Ling Tien Kung Exercises or known as Fu Chi regularly. Ling Tien Kung may improve wellness and health status. The techniques focus on Kegel exercises as it is believed that rectal is the Centre of human health. Breathing exercise and stretching are also big parts of this activity (Wiaro, 2013). Ling Tien Kung Exercise may help to increase blood flow and body metabolisms as well as metabolite excretions (Kertia N, 2009).

## METHODS

This study used a cross-sectional study design. The population in this study were people aged 55 – 70 years old and active members of Posyandu Lansia which is an integrated community service for the elderly in RW 4 and 5 at Sumber Porong Village Malang. Because of the pandemic of COVID -19, only 25 Respondents were involved in this study. Inclusion criteria in this study were as followed: fully conscious, no hearing loss, able to understand verbal commands, and no history of severe health conditions. The respondents in this study did not take any medication for gout or high uric acid levels. The Sampling technique used in this study was a purposive sampling method.

The independent variable was regular attendances for Ling Tien Kung Exercise and the dependent variable was blood uric acid levels. A finger prick blood testing using a blood uric acid meter was used to measure the uric acid level in this study. This study was conducted in the COVID-19 pandemic. Therefore, the exercises were carried out once a week for 45 minutes for two consecutive months. The respondent attendances were recorded. The uric acid was measured twice, in the beginning of the study and after the two-months of intervention. Data were then analyzed using Pearson's Correlation Test.

## RESULTS

The majority of the participants in our study were female (92%) and aged above 60 years old (88%). 36% of the respondents finished their junior high school, and more than half of the respondent work in the private sectors. 52% of the respondents had family history of increased uric acid levels in the serum (table. 1)

Tabel 1. Characteristics of the Respondents

Characteristics	No	%
<b>Sex (n=25)</b>		
Male	2	8
Female	23	92
<b>Age (n=25)</b>		
55-60 years	3	12
> 60 years	22	88
<b>Levels of Educations (n=25)</b>		
Completed Elementary School	3	12
Completed Junior High School	9	36
Completed Senior High School	8	32
Graduated from Graduate School	5	20
<b>Employment (n=25)</b>		
Enterpriser	17	68
Retired	8	32
<b>Family History of Gout (n=25)</b>		
Yes	12	48
No	13	52

Table 2. Pearson's Correlation of Regular Ling Tien Kung Exercise and Uric Acid Level in the Elderly

	Mean±SD	Min	Max	Level of Significance	correlation
Regular Attendance of Ling Tien Kung	6.56±1.47	2	8	0,433	0.164
Uric Acid Levels	6.21±1.62	3.9	9.8		

Using the Pearson's Correlation test we found that no significant correlation between once a week of Ling Tien Kung Exercises and uric acid levels in the blood (r: 0,433, P-value=0.164). P- value of 0.164 means a weak correlation between the two variables.

## DISCUSSION

The attendance rates of our respondents were high. Only 1 respondent dropped out from our study which attended the exercise two times only. Two female respondents had the lowest uric acid level (3.9 mg/dl) and one female has the highest uric acid level (9.8 mg/dl). 92% of our respondent were female, with almost 50% of them had uric acid level above 6 mg/dl. Only 4% of the male respondent

had uric acid level above 7 mg/dl. Pearson's R correlation test showed that no significant correlation between regular Ling Tien Kung Exercises and uric acid level in the blood ( $0.433 > 0.05$ ).

Normally, Uric Acid Levels in male are higher than female. However, women who are menopausal are at risk for getting higher level of uric acid in their blood (Ioannou and Boyko, 2013). Gout or increases level of uric acid is an age-related disease, especially among women who are menopausal, which around age of 45 – 59 years old. This is mainly caused by decreased level of estrogen hormone produced in the body (Kertia N, 2009). Physical exercise including body movement is one of choices to improve health among geriatric patients. Exercising regularly may improve cardiac functions as well as blood supply to the body (Fagard and Cornelissen, 2007). These, will also improve body metabolism and prevent the accumulations of uric acid within the body. Ling Tien Kung exercises employ stretching that will stimulate chi to decrease Adrenocorticotropin hormone released by pituitary anterior, which then reducing the secretion of catecholamine hormone by adrenal medulla (epinephrine and norepinephrine). These, will cause vasodilation of the peripheral blood vessel and increase blood supply (Muhammad et al., 2019).

A previous study conducted in 2019 found that Ling Tien Kung Training cause a decrease in uric acid levels after four weeks interventions with p-value 0.006 (Palupi and Widiani, 2019). However, a study conducted by Safitri in 2017 showed that regular Ling Tien Kung Exercises do not significantly affect uric acid level in the Elderly in Surabaya with p-value 0.935 (Safitri, 2017).

To be able to performed the ling Tien Kung correctly, the elderly should be trained and supervised frequently, as there are 23 different techniques which divided into 6 sessions that should be mastered. The more frequent this activity is performed the more effective the body metabolisms. Studies have revealed that doing Ling Tien Kung once week will have different effect compared to performing this exercise twice or three time a week (Palupi and Widiani, 2019; Rismawati, 2019) . This study showed that performing the exercise once a week have not adequately increase uric acid metabolism and excretion from body, especially in the elderly.

## **CONCLUSION**

This study has revealed that no significant correlation between once a week of Ling Tien Kung Exercise and blood uric acid level amongst elderly respondents in Lawang, East Java.

## **REFERENCES**

- Badan Pusat Statistik (2014). Statistik Penduduk Lanjut Usia. 4104001: 2014.
- Efendi, F & Makhfudli, M 2009. Keperawatan Kesehatan Komunitas: Teori Dan Praktik Dalam Keperawatan. Salemba Medika.
- Fagard, RH & Cornelissen, VA (2007). Effect of Exercise on Blood Pressure Control in Hypertensive Patients. *European journal of cardiovascular prevention and rehabilitation* 14(1): 12-17. DOI:

10.1097/HJR.0b013e3280128bbb %J European journal of cardiovascular prevention and rehabilitation

- Ioannou, GN & Boyko, EJ (2013). Effects of Menopause and Hormone Replacement Therapy on the Associations of Hyperuricemia with Mortality. *Atherosclerosis* 226(1): 220-227. DOI: <https://doi.org/10.1016/j.atherosclerosis.2012.10.044>
- Kertia N 2009. *Asam Urat*, Yogyakarta, Kartika Media.
- Krisnatuti, D, Yenrina, R & Urip, VJJPS (2008). Perencanaan Menu Untuk Penderita Asam Urat.
- Muhammad, H, Indarwati, R & Ulfiana, E (2019). Teknik Gerakan Terapi Ling Tien Kung Meningkatkan Kualitas Tidur Lansia. *Indonesian Journal of Community Health Nursing* 3(1). DOI: 10.20473/ijchn.v3i1.12216
- Ningrum, NP, Iswati, RS & Nuraini, I (2019). Application of Ling Tien Kung Movement Technique in Reducing Diabetes Mellitus in Elderly. *STRADA Jurnal Ilmiah Kesehatan* 8(2): 74-79.
- Ninsi, TNA, Suryani, D & Okfrianti, Y. *Hubungan Indeks Massa Tubuh Dan Lingkar Pinggang Dengan Kadar Asam Urat Darah Di Posbindu Wilayah Kerja Puskesmas Kampung Bali Kota Bengkulu Tahun 2020*. Poltekkes Kemenkes Bengkulu.
- Palupi, LM & Widiani, E (2019). Perbedaan Pengaruh Senam Ling Tien Kung Dan Senam Ergonomik Terhadap Penurunan Kadar Asam Urat Pada Lansia. *J Hospital Majapahit* 11(1): 60-67.
- Puddu, P, Puddu, GM, Cravero, E, Vizioli, L & Muscari, AJJOC (2012). The Relationships among Hyperuricemia, Endothelial Dysfunction, and Cardiovascular Diseases: Molecular Mechanisms and Clinical Implications. 59(3): 235-242.
- Rismawati, S. 2019. *Hubungan Senam Ling Tien Kung Dengan Tingkat Kadar Asam Urat Dalam Darah Pada Lansia Di Telaga Bandung Kecamatan Lamongan*. Universitas Airlangga.
- Rukmini, R & Kristiani, L (2021). Gambaran Pemanfaatan Pelayanan Kesehatan Tradisional Pada Penduduk Lanjut Usia Di Indonesia. *Buletin Penelitian Sistem Kesehatan* 24(1): 68-78.
- Safitri, A 2012. *Deteksi Dini Gejala, Pencegahan Dan Pengobatan Asam Urat*, Jakarta, Pinang Merah.
- Safitri, I (2017). Pengaruh Rutinitas Olahraga Terhadap Kadar Asam Urat Pada Lanjut Usia Kelompok Ling Tien Kung Sasana Mawar Surabaya.
- Soeroso J 2012. *Asam Urat*, Jakarta, Penebar Swadaya Group.
- Wiarso, G 2013. *Fisiologi Dan Olahraga*, Yogyakarta, Graha Ilmu.