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MUSCLE CRAMPS IN PRE-ELDERLYTO THE ELDERLY DUE TO INACTIVITY

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ABSTRACT

Background: Decreased muscle flexibility that occurs with age is one of the symptoms of the aging process that causes muscle cramps in certain conditions. This study aims to assess the incidence of muscle cramps. **Methods:** This study is a descriptive quantitative study that describes the condition of the incidence of muscle cramps. The population was the pre-elderly and elderly population in one sub-district, with a sample of 52 people selected by accidental. Interview data collection by researchers was conducted directly, questionnaire about experience of muscle cramps. **Results:** Almost all subjects had experienced muscle cramps (96.2%), which occurred mostly at night (77%). The body parts that experience muscle cramps in one subject can be in one part or two parts or 3 parts of the body, where the most felt muscle cramps in the calves (52.8%). A total of 82.7% of subjects experienced muscle cramps when they were not active. **Conclusion:** Muscle cramps in the elderly are common during rest, especially at night, which mostly occur in the calf muscles. This study is useful to be able to determine intervention programs during services to the elderly and pre-elderly.

Keywords: Elderly population, Muscle flexibility, Muscle cramps

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INTRODUCTION

Muscle cramps are a condition when continuous muscle contraction with high muscle tone/tension increases suddenly and as an unconscious body response that causes pain or discomfort. Most muscle cramps occur when the muscles are fatigued during sports activities, but some data shows that muscle cramps occur during daily activities and even during sleep. Muscle cramps associated with heat conditions are often seen during exercise whether strenuous exercise or physical activity. In this situation, the loss of large amounts of sweat and electrolytes is believed to be the underlying pathological mechanism (Noonan et al., 2012). The decline in muscle flexibility properties that occurs in the elderly is one of the symptoms of the aging process that causes muscle cramps in certain conditions. In a study involving 516 patients aged 60 years and over, experienced muscle cramps reported that 31% woke up due to cramps, 15% experienced cramps more than 3 times a month and a slightly higher prevalence in the 65-69 year age group compared to the 60-64 year age group and 80% of the main cramp location in the calf area (Maisonneuve et al., 2016).

Older people are those who are 60 or 65 years of age or older (World Health Organization, 2022). The number of elderly people is growing faster worldwide and people are now living longer due to improvements in diet, sanitation, medicine, health services, education, and economic progress (Gu et al., 2021). The characteristics of the elderly found that 20.7% of the elderly experienced illness and 42.1% experienced health complaints(BPS, 2022), this figure decreased from the 2019 figure in Indonesian. The decline in health that appeared due to decreased physical activity is due to musculoskeletal disorders, one of which is a decrease in muscle flexibility which causes symptoms in the form of joint stiffness and muscle cramps. Cramps are involuntary painful muscle contractions and mainly affect elderly people. Cramps can cause severe pain and sleep disturbance. Among patients over 60 years old, the prevalence of cramps varies from 46% to 56% (Maisonneuve et al., 2016). Nocturnal Leg Cramps (NLC) are a specific subset of idiopathic cramps that occur at rest in the lower extremities at night (Hallegraeff et al., 2017).

This study was conducted in the community by examining the incidence, causes, treatments, and prevention, so the aim of this study is to deeply examine the incidence of muscle cramps. Through this study, an intervention program for the prevention of muscle cramps in the pre-elderly and elderly will be developed.

METHODS

This study uses a descriptive quantitative approach that describes the condition of the incidence of muscle cramps. The population of this study were residents in one sub-district with an incidental sampling technique, namely those present at the time of data collection (Trochim et al., 2016). Data collection with interviews by researchers directly. Before the interview begins, the researcher will ask the respondent's willingness to be interviewed, if not willing, then the researcher will say thank you and not follow him as a subject of this study. The instrument used is a closed questionnaire, where the questions include the experience of muscle cramps, the incidence of muscle cramps in the past week, the time of occurrence, the body parts that experience,

and the activities that cause muscle cramps. Data were tabulated and analyzed using SPSS version 25 with uni-variate analysis, namely frequency and percent.

RESULTS

The study was conducted on 52 elderly and pre-elderly people with almost all having experienced muscle cramps(96.2%), which occurred mostly at night (77%). It was seen that in the last week before data collection most did not experience muscle cramps (67.3%). The body part that experienced muscle cramps in one subject could be in one part or two parts or three parts of the body, where the most felt muscle cramps in the calf (52.8%). A total of 82.7% of subjects experienced muscle cramps when rest. In full, it is described in table 1.

Variable	Frequency	Percentage
Age(n=52)		
≥60	37	71.2
<60	15	28.8
Experience of muscle cramps(n=52)		
Ever		
Never	50	96.2
	2	3.8
Occurrence of muscle cramps in a week(n=52)		
Occurred		
Occurred often	15	28.8
Did not happen	2	3.8
	35	67.3
Time of occurrence (n=50)		
Morning		
Day	5	9.6

Variable	Frequency	Percentage
Night	6	11.5
	39	77
Affected body parts(n=50)		
Calf		
Toes	38	52.8
Fingers	17	23.6
Thigh	13	18
Abdomen	3	4.2
	1	1.4
Position where muscle cramps occur(n=50)		
At rest		
During activity	43	82.7
	7	13.5

Table 1. Description of the incidence of muscle cramps

Descriptive analysis in 37 elderly people found that 94.6% of the elderly had experienced muscle cramps, while the rest had never experienced muscle cramps. In the Pre-elderly aged between 45-59 years, namely a total of 15 people, 100% have experienced muscle cramps.

DISCUSSION

Most of the elderly feel uncomfortable both during activity and rest due to lack of muscle flexibility which has the potential to develop muscle cramps. Muscle cramps can occur during activity or at rest both during the day and at night. Leg cramps at night are common and disturbing, especially in old age, and have a significant impact on quality of life, especially sleep quality (Rabbitt et al., 2016). This study aims to assess the incidence of muscle cramps in the limbs as well as in the abdominal muscles of pre-elderly and elderly people based on frequency, time and activities performed at the time of onset of muscle cramps. Muscle cramps in the elderly are caused by various factors such as decreased

muscle elasticity, dehydration, and electrolyte imbalance. Generally, cramps can last for a few seconds to a few minutes due to unknown or known causes in healthy people or those experiencing illness. The results of this study show that more than 96 percent of elderly people have experienced muscle cramps, but about 28 percent of elderly people experience muscle cramps once a week and 3.8 percent more than once a week.

Research on the prevalence of muscle cramps in pre-elderly and elderly women by Khalil et al showed similar results to this study where most muscle cramps occur in the calf muscles and arise at rest especially at night (Khalil et al., 2020). Nighttime muscle cramps occur in 6%-50% of adults ≥50 years and are more common in women. Although usually mild and transient, muscle cramps can be disruptive if they occur regularly, thus affecting a person's health-related quality of life and sleep quality (Sebo et al., 2022).

Excessive physical activity will cause muscle fatigue characterized by tension in some muscles which if the muscles are not rested with sufficient time, the process of muscle recovery from fatigue does not occur properly so that muscle tone is higher than normal and flexibility will be reduced. Grander et al in their study noted that muscle cramps are a symptom that appears due to insufficient rest time or experiencing general health problems, but it is also associated with conditions such as Uremia, Hypomagnesemia, Thyroid, Diabetes, Hypocalcemia, and Hypokalemia, so it is necessary to properly evaluate blood glucose, TSH tests, serum calcium, serum magnesium, and serum potassium (Grandner and Winkelman, 2017). Sudden muscle tension/cramps that occur during sleep/rest or activity indicate a lack of muscle flexibility or inadequate levels of cloride, sodium and potassium and amino acids. Muscle cramps in individuals in good health are generally characterized by sudden involuntary muscle contractions, accompanied by visible or palpable muscle knots, which resolve on their own within a few minutes, and are relieved by stretching (Therkildsen et al., 2024).

Similar to our study, Maisonneuve et all showed different results with 46% of the elderly experiencing muscle cramps and 15% of the elderly experiencing cramps more than 3x a month and 31% woke up due to cramps (Maisonneuve et al., 2016). However, the limbs that most often experience cramps show the same results, namely in the calf area. Symptoms of sleep disorders and health conditions are associated with a higher frequency of muscle cramps, especially calf muscles. The relationship between muscle cramps at night and the high level of physical activity of the elderly has been carried out by Delacour et al in their research based on data from 67 general practices. A total of 299 elderly people were included in their study and concluded that there was a strong relationship between a sedentary lifestyle and leg cramps at night (Delacour et al., 2020).

At the histological level, Hawke et al. noted that changes in type II muscle fibers (a type of muscle that contracts quickly and strongly but does not last long) in the elderly may lead to a higher risk of nighttime leg cramps. Some of these conditions show a change in the ratio between type I and type II muscle fibers with a higher proportion of type II fibers, so that these muscle fibers have decreased adaptability and are prone to cramps as a result (Hawke et al., 2013). Muscle cramps are characterized by hardening and shortening of the muscle tissue. Changes in anatomical

structure in the form of muscle shortening as a result of long-term lack of movement can increase the excitability of terminal axons and contribute to the development of cramps. Management of patients with muscle cramps includes lifestyle changes, causative treatment, avoidance of cramp-inducing medications, stretching, and nutritional care (Katzberg, 2015).

Cramps can be prevented by stretching the high-risk muscle, using the reciprocal inhibition reflex, by contracting the opposite muscle group. For example, forced dorsiflexion of the leg with the knee extended can relieve calf cramps. As a result, it has been suggested that stretching may prevent leg cramps at night. Other reported non-drug interventions include changing footwear, fixation of ankle dorsiflexion at night, changing sleeping position (Hawke et al., 2012). Still another is the once-daily intake of vitamin K2 which was shown in a randomized clinical trial to significantly reduce the frequency, intensity, and duration of nighttime muscle cramps in the elderly safely (Tan et al., 2024). These findings and prevention studies can be used as a prelude to designing intervention programs for pre-elderly and elderly in integrated in primary health care.

CONCLUSION

This study concludes that muscle cramps in the elderly and pre elderly are common (96.2%), which occurred mostly at night (77%), a large number arise in the calf muscles. Muscle cramps are not a continuous occurrence throughout the day, to avoid it, prevention needs to be done by stretching the muscles and taking vitamin K2 every day. These findings can serve as a prelude to the creation of an intervention program to prevent muscle cramps.

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