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ORIGINAL ARTICLE

Identifying sarcopenia among post-stroke older people[☆]



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KEYWORDS

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Abstract

Objective: To identify Sarcopenia among post-stroke older people in the community setting.
Methods: Cross-sectional design was used in this study. Eighty post-stroke older people were living in the community in Makassar, Indonesia participated in this study. The inclusion criteria were: has been returned from the hospital, could walk with or without walking aid, and could communicate effectively. Those with cardiovascular disorders were excluded from the study. The measurement of handgrip strength with handgrip dynamometer, physical performance with 6 min walking test, and Muscle Mass Index (MMI) with calf circumference as three aspects to determine Sarcopenia was performed. In addition, we also determine participants' fall risk with Time-up and Go test (TUG).
Results: The majority of participants had low handgrip strength (96.2%), more than one-fourth (27.5%) had low physical performance, and low MMI (32.5%). Almost half of the participants had Sarcopenia (40%), and almost all were high risk of falls (96.2%).
Conclusion: The number of Sarcopenia incidence and fall risk among post-stroke older people is quite high. Therefore, an intervention program to manage and reduce Sarcopenia incidence among post-stroke older people should be developed.
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Introduction

Globally, the number of older people keeps increasing. Similar trends have also occurred in Indonesia. At present, the number of older people in Indonesia reaches 23.66 million (9.03%) of the total population and is expected to increase by 2035 by 48.19 million.¹ When reaching an older age period, various health problems started to rise. In 2015, the morbidity rate for the older people reached 28.62%, mean-

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ing that out of every 100 older people, there were around 28 people who were ill. One of the diseases suffered by older people is Stroke. Stroke is currently ranked third in the ten most diseases experienced by the older people in Indonesia.²

Post-stroke conditions included recovery, can walk again, have speech problems, urination disorders, bowel disorders, emotional disturbances, sleep disorders, patterns of thinking. The patients might only be able to lie down and experienced physical limitations due to muscle function impairment.³ The conditions mentioned above will significantly affect the ability of the older people in performing self-care or a series of activities to improve and maintain their health status.^{4,5} In addition, the inability to mobilize appropriately could be one of the causes of a decreasing muscle mass or *Sarcopenia* in older people.⁶

Sarcopenia is a syndrome characterized by a reduction in skeletal muscle mass and muscle strength that occurs progressively and thoroughly. Most people start losing the amount of muscle mass after the age of 30 years. *Sarcopenia* incidence has increased from 35 million in 2000 to 40 million in 2010, and then to 55 million in 2020. In 2030, there will be around 72.1 million *Sarcopenia* incidence. In Asia, the incidence of *Sarcopenia* in older people age above 60 years is 8–22% in women and 6–23% in men.⁷ The etiology of *Sarcopenia* is widely regarded as multifactorial, characterized by neurological decline, hormonal changes, activation of inflammatory pathways, decreased activity, chronic disease, fat infiltration, and poor nutrition. Three factors cause

Sarcopenia, namely decreased muscle mass, muscle strength and decreased physical performance which is characterized by reduced physical activity.⁸ *Sarcopenia* also has an impact on changes in a person's body structure, such as progressive loss of muscle mass, muscle movements that start to slow down with age and also decrease in muscle strength.⁹ Furthermore, it also harms the body when the muscles are not used properly as when someone is sick.⁷ This condition might increase the risk of falls, injury, and even death.¹⁰

The incidence of Stroke combined with the aging process might increase the risk of *Sarcopenia*. However, there is still limited research related to the identification of *Sarcopenia* incidence among post-stroke older people. Early identification of *Sarcopenia* among post-stroke patients is crucial because nurses could use this essential information to immediately take precautions so that the condition of the older people post-stroke is not getting heavier. It can help them to be able to continue their daily activities. Therefore, researchers intended to identify the incidence of *Sarcopenia* among post-stroke older people.

Methods

A cross-sectional design was used in this study. Data collection was carried out in 4 areas of the Public Health Centre in Makassar. Makassar is the capital of the South Sulawesi Province, which is a metropolitan city in The Eastern part

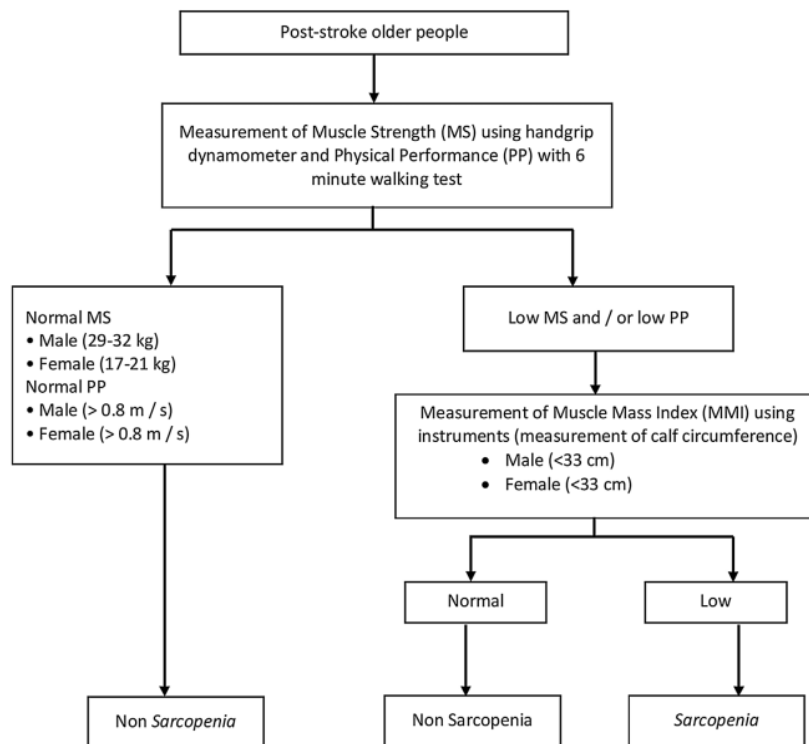


Figure 1 Sarcopenia determination flow.

of Indonesia. With the snowballing sampling technique, we obtained 80 post-stroke older people as participants with the following criteria: have been returned from the hospital, could walk with or without walking aid, and could communicate effectively. Those with cardiovascular disorders were excluded from the study. Three aspects are measured before determining the incidence of *Sarcopenia* according to the Asian Working Group for *Sarcopenia*, namely handgrip strength, physical performance, and Muscle Mass Index (MMI).¹¹ The *Sarcopenia* determination flow can be seen in Fig. 1. The measurements made in this study are handgrip strength with handgrip dynamometer, physical performance with 6 min walking test, and Muscle Mass Index (MMI) with calf circumference. In addition, we also determine participants' fall risk with Time-up and Go test (TUG). This study was approved by the Hasanuddin University Medical Research Ethics Committee. All participants gave their informed consent before data collection.

Results

Participants' characteristics, sarcopenia incidence, and fall risk are shown in Table 1. The majority of participants had low handgrip strength (96.2%), more than one-fourth (27.5%) had low physical performance, and low MMI (32.5%). Almost half of the participants had *Sarcopenia* (40%), and almost all were high risk of falls (96.2%).

Discussion

Almost half of the participants in this study were identified as having *Sarcopenia*. Older people with health conditions that start to decline and experience some diseases such as Stroke are more likely to experience a decrease in muscle strength, physical performance, and muscle mass so the older people with these conditions will be prone to get sarcopenia.¹¹ In addition, Stroke is a major cause of disability among older people because it can interfere with the functional abilities and, in turn, can affect one's physical activity. Impaired living power can cause a decrease in muscle strength and function so that it can be one of the triggers for the increased incidence of *Sarcopenia*.¹²

Another finding from this study was the high rate of fall risk. Post-stroke older people who have been *Sarcopenia* are also at high risk of falling. Several factors can affect the risk of falls in the elderly, one of which is *Sarcopenia*, which is characterized by decreased muscle mass, muscle strength, and low physical performance.¹³ *Sarcopenia* has also been associated with poor balance endurance, decreased physical activity, and decreased walking speed. The risk of falling can also be doubled for older people with chronic illnesses, with one example of a stroke.

This study had some limitations. We only conduct a descriptive study without further investigating the relationship between *Sarcopenia* incidence and fall risk. In addition, we do not assess rehabilitation attendance history, which might affect muscle strength, physical performance, and MMI of participants. However, the result of this study might use as a reference for the existence of *Sarcopenia* incidence among post-stroke older people in Indonesia.

Table 1 Participants characteristic and sarcopenia incidence.

Variables	n	%
Age		
60–74 years old	52	65.0
75 years old and above	28	35.0
Gender		
Male	48	60.0
Female	32	40.0
Stroke history		
New	52	65.0
Recurrent	28	35.5
Time since last stroke attack		
Acute phase (2 weeks–6 months)	1	1.2
Chronic phase (>6 months)	79	98.8
Using walking aids		
Yes	15	18.8
Not	65	81.8
Type of walking aid		
No aid	65	81.2
Stick	10	12.5
Walker	2	2.5
Wheelchair	3	3.8
Muscle strength		
Normal	3	3.8
Low	77	96.2
Physical performance		
Normal	58	72.5
Low	22	27.5
Muscle Mass Index (MMI)		
Normal	52	67.5
Low	25	32.5
Sarcopenia		
Yes	32	40.0
No	48	60.0
Fall risk		
No risk	3	3.8
High risk	77	96.2

Conclusion

Considering the number of *Sarcopenia* incidence and fall risk among older people with Stroke is quite high, an intervention program to manage and reduce *Sarcopenia* incidence among older people with post-stroke should be developed.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgments

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