CHARACTERISTIC OF FALL IN SARCOPENIC PATIENTS AT THE NATIONAL GERIATRIC HOSPITAL

Tran Viet Luc [1,2], Vu Thi Thanh Huyen[1,2], Nguyen Thi Phi Yen[1], Nguyen Trung Anh[1,2], Nguyen Thi Hoai Thu[1,2]
1. National Geriatric Hospital, 2. Hanoi Medical University

DOI: 10.47122/VJDE.2023.64.7

ABSTRACT:

Objective: to describe the characteristic of falls in sarcopenic patients at National Geriatric Hospital. **Method:** The study is a cross-sectional descriptive study. Inpatients and outpatients at National Geriatric Hospital excepted for Emergency and Stroke departments, Intensive care unit. The research was conducted from July to October 2022. **Results:** Mean age 75.68±8.20, 78.2% female. 64 (21.8%) participants reported at least 1 fall in the previous 12 months and 42.9% of participants had a high risk of fall. The majority of falls occurred at home and in the house or bedroom (40%). **Conclusion**: Patients with sarcopenia have a high prevalence of falls and a high risk of falls. Fall risk assessment and implementation of fall prevention should be carried out in everyday practice.

Keywords: sarcopenia, fall, sarcopenic patients, fall in older people

Correspondence: Tran Viet Luc
Address: Hanoi Medical University
Submission date: .....August 2023
Revised date: 12th August 2023
Acceptance date: 30th September 2023
Email: tranvietluc@hmu.edu.vn
Tel: 0912532456

1. INTRODUCTION

Sarcopenia is classified as a musculoskeletal disorder that is characterized by low muscle mass, low muscle strength, and low physical performance [1,2]. Sarcopenia is also considered age-related or natural aging and all people begin experiencing muscle loss in middle age [3] and the prevalence of sarcopenia was around 6%–22% in older adults globally [4]. A systematic review conducted in 2014 reported the prevalence of sarcopenia varied from 1 to 29% in community-dwelling older people, from 14 to 33% in long-term care, and about 10% in acute hospital care populations [5].

Fall is one of the adverse outcomes of sarcopenic situations on older people. Fall is defined by World Health Organization (WHO) as an event that results in a person coming to rest inadvertently on the ground or floor or other lower level. The CDC reported that more than one out of four older people falls each year [6]. Both falls and sarcopenia in older adults are major causes of injury that may result in fracture, disability, and poor quality of life. The rate of falls in people with sarcopenia is 1,6–3.2 times higher compared to others without sarcopenia and significantly high in community-dwelling older people with sarcopenia (27,3% vs. 9,8% - EWGS). In Vietnam, the rate of falls in outpatients is relatively high, almost 1 out of every 4 outpatients experienced falls, and is highly concentrated in groups≥ 60 years old [7]. The prevalence of sarcopenia in outpatient clinics (2018) ranged from 40.5% - 54.7% depending on the diagnostic criteria used [8].

Sarcopenia is an age-related condition,

meanwhile, the population in WHO South-East Asia Region is aging rapidly and will continue to increase until 2050. This raises a serious concern because Vietnam is a developing country in the South-East Asia Region but the number of studies on sarcopenia in Vietnam is quite small, especially the correlation between sarcopenia and other factors especially falls, while there are many studies in the world. Therefore, we conducted this study to describe the characteristic of falls in sarcopenic patients at the National Geriatric Hospital.

2. METHOD AND MATERIALS

2.1. Study design

The study is a cross-sectional descriptive study.

2.2. Study subject, sampling, and sample size

Patients 60 years old and older were being examined and treated at National Geriatric Hospital.

• Inclusion criteria:

- Patients who were diagnosed with sarcopenia by specialist doctors according to the AWGS criteria.

- Patients who had already been diagnosed with and received treatment for sarcopenia before.

- Patients and patients' families agreed to participate in the study (agree to answer questions regarding general health and disease status according to the outline proposed by the research).

- The patients are fully conscious and have the physical and cognitive abilities to do a face-to-face interview.

• Exclusion criteria

- Patients or families refused to participate in the study.

- Patients who do not have the physical and cognitive abilities to do a face-to-face interview.

- Patients with advanced dementia and terminal illness, acute and malignant diseases (advanced cancers, end-stage chronic diseases, acute myocardial infarction, acute stroke, symptomatic cardiovascular disease).

Sampling

Convenience sampling

The sample size is calculated using the formula: $n = (Z_{1-\frac{\alpha}{2}})^2 \frac{p(1-p)}{d^2}$

p = 0.25 (Sex differences in impact of sarcopenia on falls in community-dwelling Korean older adults in 2021) [9]

From the formula, the estimated sample size was 288 sarcopenic patients.

2.3. Location and time

Inpatients and outpatients at the National Geriatric Hospital excepted for Emergency and Stroke departments and Intensive care unit. The research was conducted from July to October 2022.

2.4. Tools and data collection method

Data were collected by using designed tools including general information, history of fall, and 21-item fall risk index. Data were collected by using research questions through interviews, diagnosis tests, laboratory tests, and medical records at National Geriatric Hospital.

General information: age, gender, occupation, marital status, highest level of education, smoking, drinking alcohol, BMI, living area

Fall characteristics: Fall history, location of fall, number of falls, fall circumstances, fall injury, fall risk- 21 items

Sarcopenia criteria to diagnose

Sarcopenia diagnosis by the standard of the Asian Working Group for Sarcopenia (AWGS):

- Criterion 1: Low muscle mass (kg):

Each patient was assessed whole-body skeletal muscle mass by using a Bioelectrical Impedance Analysis (BIA) (InBody 770, Biospace Co., Ltd.). The results show the muscle mass of each body part (kg) standardized to height2: SMI = ALM (kg)/ height2 (m).

- Criterion 2: Low grip strength: The low grip strength is evaluated using Jamar TM (Hydraulic Hand Dynamometer J1, USA), 2 trials were performed on both hands, and the better of the two trials was used for scoring purposes.

- Criterion 3: Low physical performance is evaluated by a 6m walk test, calculated by the patient's time to cover the 6m distance outline.

Based on the AWGS, diagnosis of sarcopenia required the presence of low muscle mass plus low muscle strength or/and low physical performance. Sarcopenia can be separated into 2 types:

+ Mild sarcopenia: decreasing muscle mass, muscle strength, or physical performance.

+ Severe sarcopenia: decrease in muscle mass, muscle strength, and physical performance.

AWGS	Men	Woman
(1) Skeletal muscle mass (ALM/ht2)	< 7.0 kg/m^2	< 5.7 kg/m^2
(2) Low grip strength	< 28 kg	< 18 kg
(3) Low physical performance	< 1.0 m/s	

2.5. Data processing and data analysis

The process of data coding, entry into Redcap, and analysis was done by using Statistical Package for Social Science (SPSS) software (version 20). Descriptive statistics were adopted to examine characteristic data: frequency, percentage, and mean.

3. RESULTS

A total number of 294 older sarcopenic patients were selected for this study. After completing the data analysis, the demographic and baseline characteristics of the participants were shown below.

Table 1: General information (n=294)

Characteristics		**Frequency (n)**	**Percent (%)**
Aged group	60 – 69	73	24.8
	70-79	115	39.1
	≥80	106	36.1
	Mean age ±SD	75.68±8.20	
Gender	Male	64	21.8
	Female	230	78.2
Educational level	Below high school	140	47.6
	High school	55	18.7
	Above high school	99	33.7

Occupation	Retirement	160	54.4
	Others	134	45.6
Marital status	Married	215	73.1
	Others	79	26.9
Living with	Family	273	92.9
	Alone	1	0.3
	Caregiver	20	6.8
Current living location	Rural	125	42.5
	Urban	169	57.5
Current smoking	Yes	3	1
	No	291	99
Current drinking	Yes	9	3.1
	No	285	96.9

Demographic details of patients in this study are shown in table 1. In the total 294 participants, the age of the sample ranged from 60 to 97 with the mean age being 75.68 ± 8.20 years old. The greatest distribution was generated by people aged 70-79 years old, with a percentage of 39.1%. Female subjects accounted for 78.2%, higher than male subjects accounted for 21.8%. The highest percentage of sarcopenic patients was below the high school group, with 47.6% and the lowest was the high school group with 18.7%. (**Table1**)

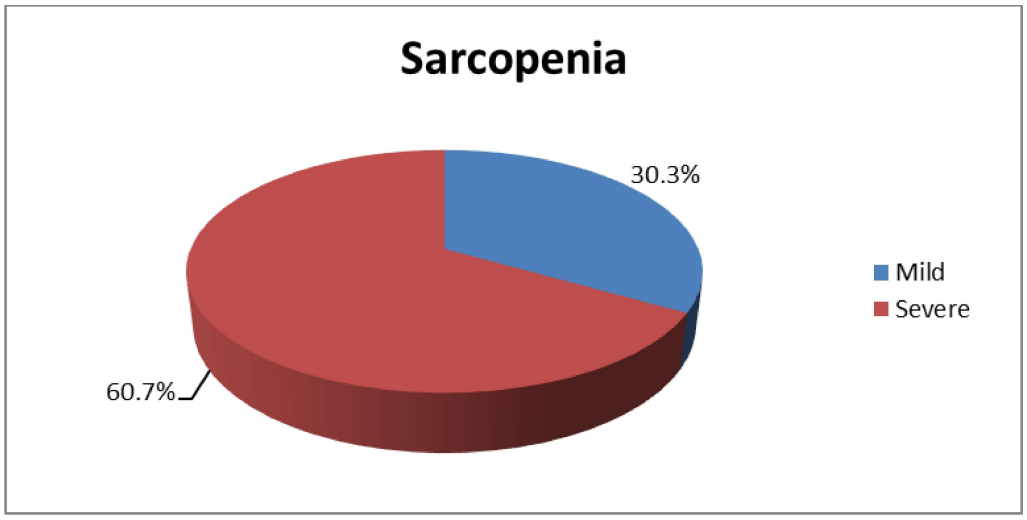

Figure 1: Classification of sarcopenia

Figure 1 showed the characteristics of mild sarcopenia in older sarcopenic patients based on the AWGS recommendation was 30.3% (n = 89) of sarcopenic patients and 60.7% and severe sarcopenic patients.

Table 2: Prevalence of falls and number of fall participants (n=294)

Characteristics		Frequency (n)	Percentage (%)
Prevalence of fall wihin 12 months	Yes	64	21.8
	No	230	78.2
Number of fall within 12 months	1 time	18	6.1
	≥ 2 times	46	15.6
21 fall risk index	Low risk of fall	168	57.1
	High risk of fall	126	42.9

Table 2 showed in 294 participants, 64 (21.8%) people who experienced a fall at least once in the previous year. The number of falls of the participant in the previous 12 months. 18 (6.1%) participants had two or more falls and 30 fall times was the maximum number of falls suffered by one individual. Of 294 participants, there were 126 people, equivalent to 42.9% of people, who were at high risk of falls and 57.1% of participants were at low risk of falls following the 21 fall risk index.

Table 3: Characteristics of fall in sarcopenic participants (n=294)

Variables		Frequency (n)	Percentage (%)
Fall location	In the house/ bedroom	26	40
	Bathroom/toilet	22	34.4
	Stairs	10	15.6
	Porch	11	17.2
	Outside the house	12	18.8
	The other	1	1.6
Fall circumstances	Dizziness	5	7.8
	Slipping	39	60.9
	Imbalance	27	42.2
	The other	5	7.8
Fall injury	No injury	11	17.2
	Mild injury	43	67.2
	Fracture bone	6	9.4
	Hospitalization	6	9.4
	The other	0	0

Table 3 shows the characteristics of fall among the participants. The majority of falls occurred at home and in the house or bedroom (40%).

Moreover, a high percentage of falls were caused by slippery floors, followed by losing balance, a consequence of dizziness, and other causes. Regarding the consequences of falls, the majority were no injury or mild injury, and the hospitalization rate was only 9.4%.

4. DISCUSSION

In the total of 294 participants, there was a large difference between males and females. The number of females was much higher than the number of males with 64 males and 230 females, the ratio was 3.6.

However, Yunsoo Soh & Chang Won Won in a study on the risk of falls in Korean elderly people, among 428 sarcopenic elderly, other results with the prevalence of females and males were 57.5% males and 42.5% females.

Another research by Landi et al (2012) showed that the proportion of males (32%) was lower than those of females (68%) [10] the reasons that may be explained for this difference are different research subjects or sample sizes.

The average age of participants in this study was 75.68 years old (SD=8.20). According to Nguyen et al., the average age of sarcopenic participants was 72.2±8. However, the research conducted by Landi et al in 2012 evaluated sarcopenia as a risk of fall in the older population, the average age of participants was 86.7 years old (SD=5.4) and the same as the sarcopenic group in this study [10].

Another research was conducted on Chinese participants with an age range was 80–99 years in which the mean age of the sarcopenic group was 87.9±3.7 years old. The reasons can be explained by the research area being different research subjects or sample sizes.

The percentage of mild sarcopenia with 30.3% and severe sarcopenia with 69.7% in this study, the ratio was 2.3:1. However, the percentage of mild sarcopenia and severe sarcopenia in Yunsoo Soh & Chang Won Won was 80.6% and 19.4%, the ratio was 1:4.2. Percentage of mild sarcopenia and severe sarcopenia among women population in AB.

Gadelha's research was nearly 1:1. The differences may be explained by sample size and different research subjects.

21-item Fall risk index was performed to assess fall risk in this study, the percentage of patients at high risk of fall was 42.9%. The same result was found in the research of Nguyen Trung Anh on hypertension with 41% of patients having a high risk of falls.

The number of falls of the patients calculated in the last 12 months was 64 subjects (21.8%), and there were 18 patients (6.1%) had a fall in the past 12 months. The number of patients who fell 2 or more times was 46 patients (15.6%). Thus, among patients with falls, the rate of repeat falls was 71.8%.

This result is similar to the prevalence of falls also found in Weihao Xu's research with 22.6% reported falls in the last 12 months. In Ha et al.'s study, the number of patients who reported 2 or more falls in the past 12 months was 24.2% of total patients who reported falls [7]. This may be explained by the differences in sample size and subject.

Patients who fell in their bedrooms, in their homes, and in the toilets accounted for the majority of the total number of falls in the study. This ratio was 40% and 34.4% respectively.

However, according to research by Ha et al., the prevalence of falls in bedrooms and bathrooms was 13.3% and 35.2% [7]. These differences can be explained by this research conducted after Covid-19, patients are still getting used to staying at home and the patient is elderly.

The percentage of patients without injury accounted for 17.2%. The percentage of soft tissue injuries account for more than half (67.2%) of all types of injuries. The fracture and hospital followed up with 9.4%. The percentage of soft tissue injuries accounted for a high proportion as research by Ha et al. (73.9%) [7].

5. CONCLUSION

Patients with sarcopenia have a high prevalence of falls and a high risk of falls. Fall risk assessment and implementation of fall prevention should be carried out in everyday practice.

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