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PREVALENCE OF SARCOPENIA IN OLDER ADULTS FROM TWO NURSING HOMES IN PEREIRA, COLOMBIA

PREVALENCIA DE SARCOPENIA EN ADULTOS MAYORES DE DOS HOGARES GERIÁTRICOS DE PEREIRA, COLOMBIA

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ABSTRACT

Introduction: It is a risk factor for morbidity, mortality, and disability in older adults, so its management is a priority in geriatrics. This article aims to characterize a population of older adults from two nursing homes and establish the prevalence of sarcopenia and the degree ofdependency. **Methods:** Cross-sectional study developed in the city of Pereira-Colombia. A population of 72 adults from 65 to 98 years old using probabilistic sampling. Sarcopenia was determined using the European Consensus Criteria on the Definition and Diagnosis of Sarcopenia; evaluating the grip strength, skeletal muscle mass index, in case of sarcopenia, its severity together with the walking speed, and the degree of dependence according to the Barthel scale. **Results:** 57 people finally participated, 68,4% (n=39) were women. The median age was 83 years. 2% did not have sarcopenia, 9% had suspected sarcopenia, 28% had confirmed sarcopenia, and 61% had severe sarcopenia. According to the Barthel scale, 31,5% were independent, 45,6% had a mild dependency, 15,8% moderate dependency, 5,3% severe dependency, and 1,8% total dependency. **Conclusions:** The prevalence of sarcopenia in nursing homes in Pereira is high, even higher than reported in the literature. Similarly, being in a private nursing home does not guarantee a better physical condition and quality of life.

Keywords: Sarcopenia; Friar elderly; Geriatric Health Services, Prevalence. (Source: MeSH NLM).

RESUMEN

Introducción: La sarcopenia es un factor de riesgo para morbilidad, mortalidad y discapacidad en adultos mayores, por lo que su manejo es prioridad en geriatría. El objetivo de este artículo, consiste en caracterizar una población de adultos mayores de dos hogares geriátricos y establecer la prevalencia de sarcopenia y el grado de dependencia. **Métodos:** Estudio de corte transversal desarrollado en la ciudad de Pereira-Colombia. Se incluyó a una población de 72 adultos desde los 65 hasta los 98 años, usando muestreo probabilístico. Se determinó la sarcopenia por medio de los Criterios del Consenso Europeo sobre Definición y Diagnóstico de Sarcopenia; evaluándose la fuerza de prensión, índice de masa muscular esquelética, en caso de presentarse sarcopenia, la severidad de esta junto a la velocidad de marcha, y el grado de dependencia según la escala de Barthel. **Resultados:** Participaron finalmente 57 personas. El 68,4% (n=39) eran mujeres. La mediana de la edad fue de 83 años. El 2% no presentó sarcopenia, 9% presentaban sospecha de sarcopenia, 28% tenían sarcopenia confirmada y 61% sarcopenia grave. Según la escala de Barthel, el 31,5% eran independientes, 45,6% tenían dependencia leve, 15,8% moderada, 5,3% severa y 1,8% total. **Conclusiones:** La prevalencia de sarcopenia en los hogares geriátricos de Pereira es elevada, incluso mayor a la reportada en la literatura. Del mismo modo, encontrarse en un hogar geriátrico privado no garantiza una mejor condición física y/o calidad de vida.

Palabras claves: Sarcopenia; Anciano Frágil; Hospitales Geriátricos; Prevalencia. (Fuente: DeCS BIREME).

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INTRODUCTION

Sarcopenia is a generalized and progressive musculoskeletal disorder characterized by the loss of mass, strength, and functioning of the muscular system of the elderly, related to multiple risk factors (nutritional, lifestyles, hormonal imbalance, and others) [1], it reduces mobility, decreases the quality of life and is a potential risk factor for falls [2].

According to the World Health Organization [3], the adult population over 80 years of age increased to 125 million people in 2018. It is estimated that by 2050, those over 60 years of age will double their number [3]. In Colombia, data obtained from a national census carried out in 2018 [4] determined that the population over 60 years of age was 13.3%, with an aging rate in the department of Risaralda of 60.6%, this being the third highest at the national level, surpassed only by Quindío (72.29%) and Caldas (67.07%) [4]. In Peru, the prevalence of this pathology is 15-17% in elderly people [5].

This pathology increases the costs in the care of the elderly patient since it leads to other comorbidities such as serious traumas due to falls, pathological fractures, physical instability that increases the risk of injury with the environment, and the use of elements such as canes and treadmills [6]. In the same way, this condition is associated with an increase in all causes of morbidity, mortality, and disability, causing worse results mainly in the management of prevalent diseases in the frail elderly, such as renal and intestinal pathologies [7]; which generates high costs for the health system due to the persistent delivery of supplies, longer hospital stays, a greater number of complications, and extensive rehabilitation. Based on the previous, working on the prevention and early management of sarcopenia would abruptly reduce the costs of patients, family members, and the health system.

Currently, one of the sustainable development goals proposed by the United Nations Organization aims at the health and well-being of the general population, promoting and guaranteeing a healthy life at all ages [8].

In this order of ideas, the main objective of this study was to determine the prevalence of sarcopenia and the degree of dependency in the elderly in two nursing homes, one private and one public, in Pereira, Risaralda. Since these regions do not have this type of characterization and its relationship with different factors such as skeletal muscle mass, muscle strength and physical functionality.

METHODS

Design and study area

Prospective cross-sectional study were developed in two nursing homes in Pereira, Risaralda - Colombia, during the year 2019. The objective was to find the prevalence of sarcopenia in older adults from two nursing homes from Pereira, Risaralda, Colombia, through a survey that contained demographic data, Barthel, biopedanciometry, and gait evaluation.

Population and sample

A population of 72 adults between 65 and 98 years of age was included. The following inclusion criteria were established: adults over 65 years of age, without distinction of sex, who belonged to nursing homes with active registration and who could express themselves verbally, who did not have physical disabilities due to the absence of limbs, and who agreed to participate through the signing of informed consent (affirmation of participation read and informed verbally in those in a condition of illiteracy).

Those people with the presence of edema that could alter the results of bioimpedance analysis (BIA), people who had verbal disabilities and illnesses that limited communication, psychiatric illnesses, which were confirmed by means of antecedents mentioned by caregivers, physical therapists, and administrators of the place, who had access to his pathological history through his clinical history. After carrying out the inclusion and exclusion criteria, and through proportional sampling (error of 5%, reliability of 95%, and proportional value of 75% - the proportion of women), a sample of 57 people was obtained (8 from the first household and 49 of the second).

Variables and instruments

The Barthel scale validated by Javier Cid-Ruzafa (1997)[9] to measure the degree of dependency. This one has 10 questions, where the score corresponds to: 0 to 24 total dependency, from 25 to 49 severe dependency, from 50 to 74 moderate dependency, from 75 to 90 slight dependence, and from 91 to 99, independence. At the same time, the measurement of prehensile strength was carried out, according to the Southampton protocol9, with the dynamometer (Smedley III®), which was carried out with the patient seated, his hands on the armrests, at 90° with the feet supported, the appropriate action of the dynamometer was instructed, 3 grips were also made in each arm and the highest data was chosen to be annexed to the database. He perked up, and 30-second intervals were given.

For the BIA, a suitable place was prepared, illuminated, without obstacles, and flat terrain. Residents went to the scale (Tanita® BC-418 50KHz), and height was recorded, and after this, the participant was asked to stand on it. 500 grams were added to the total weight of each measurement as an additional weight for the accessories they were wearing.

For the evaluation of walking speed, the time it took each participant to walk a distance of 4 meters was measured, and it was executed 2 times (round trip) to have greater speed precision. A stopwatch was used to determine the exact time of each run, and they were allowed to use support tools (cane and walker) for those who needed it. The diagnosis of sarcopenia was defined according to the EWGSOP [10]: decreased prehensile strength that represents a risk of suffering from sarcopenia (<27 kg in men and 17 kg in women), in which diagnosis was confirmed by BIA (<7 kg/m2 in men and <5.5 kg/m2 in women) and is classified as severe if they have a reduced walking speed (<0.8 m/s).

Statistical analysis

Data were analyzed using Microsoft Excel® (Albuquerque, New Mexico, United States). The assumption of normality was evaluated using the Shapiro Wilk test. The variables that presented a normal distribution were described according to their mean and standard deviation, while those did not, with the median and interquartile range. The Chi-square test was used to analyze risk factors. The prevalence of sarcopenia was estimated and hypotheses were tested with inferential statistics for proportions with Student's t-test. P-value <0.05 was considered statistically significant.

Ethical aspects

This research respected the rights and principles enshrined in the Helsinki Declaration11, and was classified as minimal risk according to resolution 8430 of 1993 of the Colombian Ministry of Health12. Similarly, this study was endorsed by the Research Ethics Committee of the Autonomous University Foundation of the Americas, also receiving authorization from the directives of the respective geriatric institutions to carry out the study.

RESULTS

A total of 57 people participated, 49 older adults in the first home, which was private, and 8 in the second home, which was government (public). 68.4% (n=39) were women. The median age was 83 years with an interquartile range (IQR) of 76.0 – 87.5 years. 100% of individuals were of mestizo ethnicity.

The median BMI was 26.3 kg/m2 (IQR: 23.2 – 30.4 kg/m2), no participant had malnutrition, 38.6% (n=22) had normal weight, 31, 6% (n=18) overweight and 29.8% (n=17) obese. The median of the Barthel Index was 85 points (IQR: 75 – 100], with 68.5% of the participants having some degree of dependency. Table 1 describes the other results of this scale.

The median of prehensile strength in Las women was 15.5 (IQR 8.6 – 30.9) and 22.0 for men (IQR 12.5 – 41.6). 83.33% of the men had decreased strength, the same for 56.41% of the women. Consequently, 64.91% percent of the total number of participants obtained a result below the cut-off point to define decreased grip strength. The remaining 35.09% were above it, without representing a measure corresponding to sarcopenia suspicion. The median SMI index (skeletal muscle mass) was 6.9 kg/m2 (IQR: 6.4 – 7.6), with 50% of the participants presenting low SMI.

Table 1. Description of dependency degrees of the study population according to the Barthel scale.

Barthel Scale	n	%	Median Age	Barthel Score
Total Dependence	1	**1,8**	77,0	15,0
Severe Dependence	3	**5,3**	84,7	41,7
Moderate Dependence	9	**15,8**	83,9	59,4
Mild Dependence	26	**45,6**	81,6	84,8
Independence	18	**31,5**	80,3	99,7

Table 2 shows the percentage of people with sarcopenia, where the highest percentage corresponds to severe sarcopenia (61%), followed by sarcopenia confirmed by BIA (28%), covering the majority of the population studied. Regarding the distribution of sarcopenia, it was found that home 1 (private) had 92% of patients with sarcopenia, while home 2 (public) had 72% with this diagnosis.

Table 2. Description of the overall prevalence of sarcopenia

Diagnosis of sarcopenia	n	Prevalence	Interval 95%	
			Minimum	Maximum
No sarcopenia	1	**2%**	0,0%	5,4%
Suspected sarcopenia	5	**9%**	1,5%	17,0%
Confirmed sarcopenia	16	**28%**	15,8%	39,7%
Severe sarcopenia	35	**61%**	48,1%	74,1%

Table 3 shows the results by household subclassified according to the degree of severity and/or the absence of sarcopenia. Regarding gender, only one woman was found without sarcopenia, while 11% had suspected sarcopenia (n=4), 32% had confirmed sarcopenia (n=12), and 57% had severe sarcopenia (n= 22). In the case of men, no men were found within the category without sarcopenia. With suspected sarcopenia, 6% (n=1), while 22% (n= 4) and 72% (n= 13) had confirmed sarcopenia and severe sarcopenia, respectively.

Table 3. Distribution of the diagnosis of sarcopenia by households.

Household 1 (Private)	n	Prevalence	Interval 95%	
			Minimum	Maximum
No sarcopenia	1	2%	0,0%	6,0%
Suspected sarcopenia	3	6%	0,0%	12,9%
Confirmed sarcopenia	14	28%	15,7%	39,6%
Severe sarcopenia	31	64%	51,0%	76,6%
Home 2 (Public)				
Without sarcopenia	0	0%	0,0%	0,0%
Suspected sarcopenia	2	29%	16,5%	40,6%
Confirmed sarcopenia	2	29%	16,5%	40,6%
Severe sarcopenia	3	42%	29,7%	56,1%

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DISCUSSION

This study aimed to characterize a population of older adults from two nursing homes and establish the prevalence of sarcopenia and the degree of dependency. It was found in the evaluated population that 89% had sarcopenia, a value well above that found in the literature, where on average it is 18%[13].

However, it should be noted that in this study the population was not institutionalized, and as mentioned by Bravo et al[14] patients residing in nursing homes have a higher prevalence of sarcopenia due to their poor nutritional status and decreased ability to function. Perform basic activities of daily living, triggering an involuntary loss of skeletal muscle mass and strength, which is linked to age [14].

Studies indicate that muscle and body mass begins to decrease from the fourth decade of life and up to 50% in the eighth decade of life [15].

In this study, only 2% (n=1) of the patients did not suffer from sarcopenia, a result associated with the age of the population studied. It is important to know that the severity of sarcopenia is associated with unhealthy lifestyles [16,18]. A sedentary lifestyle is one of the main factors responsible for muscle weakness that leads to loss of muscle mass and strength [16,18], generating greater dependence on the part of the elderly on their caregivers.

In the present study, it was observed that 45.6% of older adults, according to the Barthel scale, were classified as patients with mild dependency. According to María et al [19], dependency scales such as Barthel's help predict the development of sarcopenia and its severity, which makes it possible to prevent the compromise of functional status that will generate, in the short or long term, high costs for both the patient and the institutions, caregivers and their families, since it increases the risk of falls, fractures, and decreased independence, requiring the use of health services that could be distributed more profitably.

The increase in hospitalizations, specialized consultations, and rehabilitation, are events that carry one of the highest health costs. Pinedo et al. 20 carried out a study that determined that the costs were much higher for individuals with muscle weakness than those who did not suffer from this difficulty. The mean annual total costs for the participants with muscular weakness were 5,198.26 USD, being in Colombian pesos (COP) $23,162,211. In comparison, the patients without muscular weakness carried costs of 2,133.87 USD, COP $9,508,006, that is, more double the expenses[20].

Dorosty et al. 21 carried out a study in Ethiopia using a population of 644 patients, where they found that economic income is associated with the development of sarcopenia[21]. The proportion of pre-sarcopenia and sarcopenia in low-income households was relatively higher (22.6% and 20.5%) compared to those with medium income (21.7 and 18.2%) and higher-income high (13.7 and 12.8%) [21].

The magnitude of sarcopenia found in nursing home number 1, which was private, was greater (92%) compared to nursing home number 2, which was public (71%); a finding that allows us to demonstrate that private geriatric institutions do not always generate a better quality of life for older adults. It should also be taken into account that all patients with sarcopenia have a higher risk of in-hospital mortality, as reported by Ramos-Ramirez et al [22] who conducted a study on sarcopenia in Peru in hospitalized patients, showing a statistically significant association between this condition and mortality. (RR 4.69; 95% CI: 1.62-13.10; p=0.004).

Although the present study could not evaluate these variables, it can be estimated that almost the entire population evaluated has a high risk of dying from any type of disease, in case of suffering any complication and being hospitalized[22]. It should also be noted that some measures were not taken that could predict the risk of mortality, such as time up and go, lift test, and 6-meter walk.

In addition, the strength in the lower limbs was not evaluated. Although it was not necessary to make the diagnosis, it would have given more details about the functional status of the participants.

Similarly, other sociodemographic or pathological factors could influence the correlation between the type of nursing home and the magnitude of sarcopenia. However, the data was limited to what was available due to the history of the households. It should be noted that sarcopenia is a pathology that has been increasing in recent years, given that the generational pyramid is greater in the elderly than young people, so this pathology is prevalent in the majority of the population.

This study also shows us two different realities: private nursing home and a public one, and how this can affect or benefit the outcome of this pathology. In the same way, it serves as the basis for the restructuring of the physical exercise and diet model that is carried out in nursing homes to reduce the prevalence of sarcopenia and improve the quality of life of older adults.

It is necessary to highlight that multicenter studies must be carried out to determine the national prevalence, burden of disease, and health costs that this condition entails in order to support the design of effective public policies that counteract the impact of sarcopenia on patients, caregivers, and health system in general.

CONCLUSION

The prevalence of sarcopenia in nursing homes in Pereira, is high, even higher than that reported in the literature. Specifically, 89 out of 100 older adults in these nursing homes have sarcopenia. Similarly, being in a private nursing home does not guarantee a better physical condition and quality of life.

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