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Sarcopenia, balance and risk of falling in a sample of Portuguese community-dwelling older adults

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Background and aims

Given the growing aging index, Portuguese population is particularly exposed to a higher risk of falls, which is related to decreased levels of lower limbs muscle mass and strength. These factors are consequence of sarcopenia which has been associated with higher risk of falling . Handgrip strength is a clinical marker of risk of disability and cut-off points for defining sarcopenia through handgrip strength have been identified (Cruz-Jentoft, 2010).

Objectives

The purpose of this study was to characterise the risk of falls and related factors in community-dwelling older adults.

Participants

128 community-dwelling older adults (95 women, 33 men)
Mean age 75,4 ±7,4 years (range 65-97)
Apparently healthy
Independent in activities of daily living (ADL)
Exclusion criteria - illness or disability interfering with physical function and with the ability to perform the tests

Methods

Characterization and comorbidities data and physical activity habits were collected in a structured interview conducted by a single interviewer.
Afterward participants were asked to complete the tests. Before each test instructions were given according to specific guidelines and the participants could practice before starting the measurements.
Outcome measures were:
Berg Balance Scale (BBS) to assess the risk of falling
30s chair stand test for lower limbs strength
8-foot up and go test for mobility
Handgrip strength with the dynamometer Jamar®
Functionality with the Composite Physical Function Scale (CPF)

Results

Variables	n=128	Men (n=33)	Women (n=95)
Age, years	75,4 (7,4)	75,8 (8,0)	75,3 (7,2)
Weight, kg	69,7 (12,5)	78,9 (13,0)	66,5 (10,6)
Height, cm	155,6 (0,1)	166,7 (0,1)	151,7 (0,1)
Body mass index, n (%)	28,7 (4,1)	28,3 (3,8)	28,8 (4,2)
•Underweight (<18.5)	0 (0,0)	0 (0,0)	0 (0,0)
•Normal t (18.5-24.9)	21 (16,4)	5 (15,2)	16 (16,8)
•Overweight(>25.0)	107 (83,6)	28 (84,8)	79 (83,2)

Table 1
Characterization variables
mean (SD) or n (%)

Table 2
Tests results

Variables	n=128	Men (n=33)	Women (n=95)
Balance, BBS	53	54	53
30 s Chair stand; reps [β]	10,80 (3,8)	12,2 (2,9)	10,3 (3,9)
8-ft-up-and-go; s	8,9 (4,0)	7,5 (2,7)	9,3 (4,3)
Handgrip (right hand); kg	27,8 (9,4)	38,4 (8,9)	24,1 (6,2)
Handgrip (left hand); kg	24,8 (9,2)	35,1 (9,4)	21,2 (5,7)
Falls in the last year	46 (36)	8 (24)	38 (40)

Table 3 - Correlations between variables

		30 s Chair stand;	Handgrip (right hand);	Handgrip (left hand)	8-ft-up-and-go; s	Balance, BBS
30 s Chair stand; reps	ρ Spearman p	1,000	,583** ,000	,549** ,000	,800** ,000	,681** ,000
Handgrip (right hand);	ρ Spearman p	,583** ,000	1,000 ,000	,936** ,000	-,615** ,000	,561** ,000
Handgrip (left hand	ρ Spearman p	,549** ,000	,936** ,000	1,000	-,572** ,000	,506** ,000
8-ft-up-and-go; s	ρ Spearman p	-,800**	-,615**	-,572**	1,000	-,730**
Balance, BBS	ρ Spearman p	,681** ,000	,561** ,000	,506** ,000	-,730** ,000	1,000

Discussion

39.4% of men and 30.5% of women showed handgrip strength values lower than cut-off values for risk of mobility limitation (M -37Kg; W – 21Kg) (Sallinen *et al*, 2010)
BBS scores were above cutt-off points for risk of falling, meanwhile scores from the other tests showed lower values comparatively to other similar populations(Marques *et al*, 2014; Gouveia *et al*, 2013). 36% reported at least one fall in the past year. Lower limbs strength was lower for fallers and this was different (p=0,023) from non-fallers. 21.2% of males and 24.2% of females showed values of handgrip strength lower than cut-off points for risk of sarcopenia (M < 30Kg; M < 20Kg (Cruz-Jentoft *et al*, 2010).

Conclusions

Although the risk of falling in this sample is not increased, strength, lower limbs strength and mobility are decreased. This study reinforces the evidence that lower limbs muscle strength is lower in fallers than in non-fallers, which is described as a risk factor for falling. Assessment of these factors seems to be recommended in order to design rehabilitation programs as countermeasures for further muscle and functional deterioration and consequently decrease risk of falling.

References: Cruz-Jentoft AJ, Baeyens JP, Bauer JM, et al. Sarcopenia: European consensus on definition and diagnosis: Report of the European Working Group on Sarcopenia in Older People. Age Ageing. 2010;39(4):412-423; Gouveia ÉR, Maia JA, Beunen GP, Blimkie CJ, Fena EM, Freitas DL. Functional fitness and physical activity of Portuguese community-residing older adults. *J Aging Phys Act*. 21(1):1-19.; Marques EA, Baptista F, Santos R, et al. Normative functional fitness standards and trends of Portuguese older adults: cross-cultural comparisons. *J Aging Phys Act*. 2014;22(1):126-137; Sallinen J, Stenholm S, Rantanen T, Heliövaara M, Sainio P, Koskinen S. Hand-grip strength cut points to screen older persons at risk for mobility limitation. *J Am Geriatr Soc*. 2010;58(9):1721-1726.