

Functional capacity and risk of fall in institutionalized elderly

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Objective

The normal aging process involves a loss of functional capacity, more or less significant, caused by the deterioration of physiological systems. The decline in functional capacity, particularly at physical fitness, that involves reducing the levels of muscle strength, gait and static balance disorders, are largely indicated in the literature as major risk factors for falls in the elderly. Falls are a serious public health problem: 32% of people over 65 have at least one fall per year and 5% of falls result in fractures. The majority of seniors who had a fall will fall again within six months (Rubenstein, 2006).

The self perception of a reduced ability to self protection during the fall (speed of reaction to cling, putting hands in front, for example) and the ability to get up after falling can trigger the fear of falling and increase the functional decline by self-limitation of activity and self-restraint of participation (Melo, 2011).

The objective of our study is to determine the relationship between fear of falling, functional capacity and body composition in institutionalized elderly.

Material/Methods

We drew up a descriptive, correlational and cross-cutting study. To achieve our objective we collected the following data:

- Demographic variables: gender, age and length of institutionalization;
- Clinical history and risk factors for osteoporosis;
- Tinetti Falls Efficacy Scale (FES) (Melo, 2011);
- Senior Fitness Test Rikli Jones (1999) – modified protocol: timed up and go test (Fig. 1); 30 sec arm curl test with dumbbell (Fig.2); 30 sec sit to stand (Fig. 3); back scratch test (Fig 4); chair sit and reach (Fig. 5); unipodal balance eyes shut (Fig. 6);
- handgrip strength of both hands: Jamar® hand dynamometer (Fig. 7);
- Key pinch strength with digital dynamometer Baseline®(Fig. 8);
- Body composition: bioelectric impedance on Tanita Ironman Body Composition Monitor® (Fig. 9).



Fig. 1



Fig. 2



Fig. 3

Results

Table 1 - Functional fitness results	Women		Men	
	Standard Value	Result	Standard Value	Result
30 sec sit to stand	9-14	9	Out-15	10,63
30 sec arm curl test with dumbbell	10-16	14,381	13-19	16,74
unipodal balance eyes shut (sec)	ND	1,41	ND	1,44
Chair sit and reach (cm)	-5 a +8	-4,71	-14 a +4	-9,96
back scratch test (cm)	-14 a 0	-18,42	-24 a -5	-31,81
Timed Up and Go (sec)	8,7 - 5,7	17,82	7,6-5,2	13,03
handgrip strength right (Kg)	19,32	13,94	29,8	24,08
handgrip strength left (Kg)	17,05	12,71	24,94	24,19
Key pinch righth (Kg)	5,71	5,11	9,29	7,52
Key pinch righth (Kg)	5,17	4,98	8,66	7,26

ND: no data

A total of 73 elderly were subject to this study, 46 women (81,02±7,71 years) and 27 men (81,81±7,76 years) with FES score of 84,33±21,08.

We found correlations between age and:

- 30 sec arm curl test with dumbbell (-0,400**)
- 30 sec sit to stand (-0,331**)
- chair sit and reach (-0,307*)
- unipodal balance eyes shut (-0,278*)
- timed up and go test (0,324**)
- handgrip test left hand (-0,241*)
- key pinch strength right (-0,280*) and left (-0,366**)
- bone mass (-0,265*)
- visceral fat rating (0,296*).

We found correlations between FES score and:

- 30 sec arm curl test with dumbbell (0,442**)
- 30 sec sit to stand (0,479**)
- timed up and go test (-0,643**)
- handgrip test right hand (0,368**) and left hand (0,343*)
- key pinch strength right (0,409**) and left (0,400**)
- bone mass (0,298*)
- total muscle mass (0,290*)



Fig. 4



Fig. 5

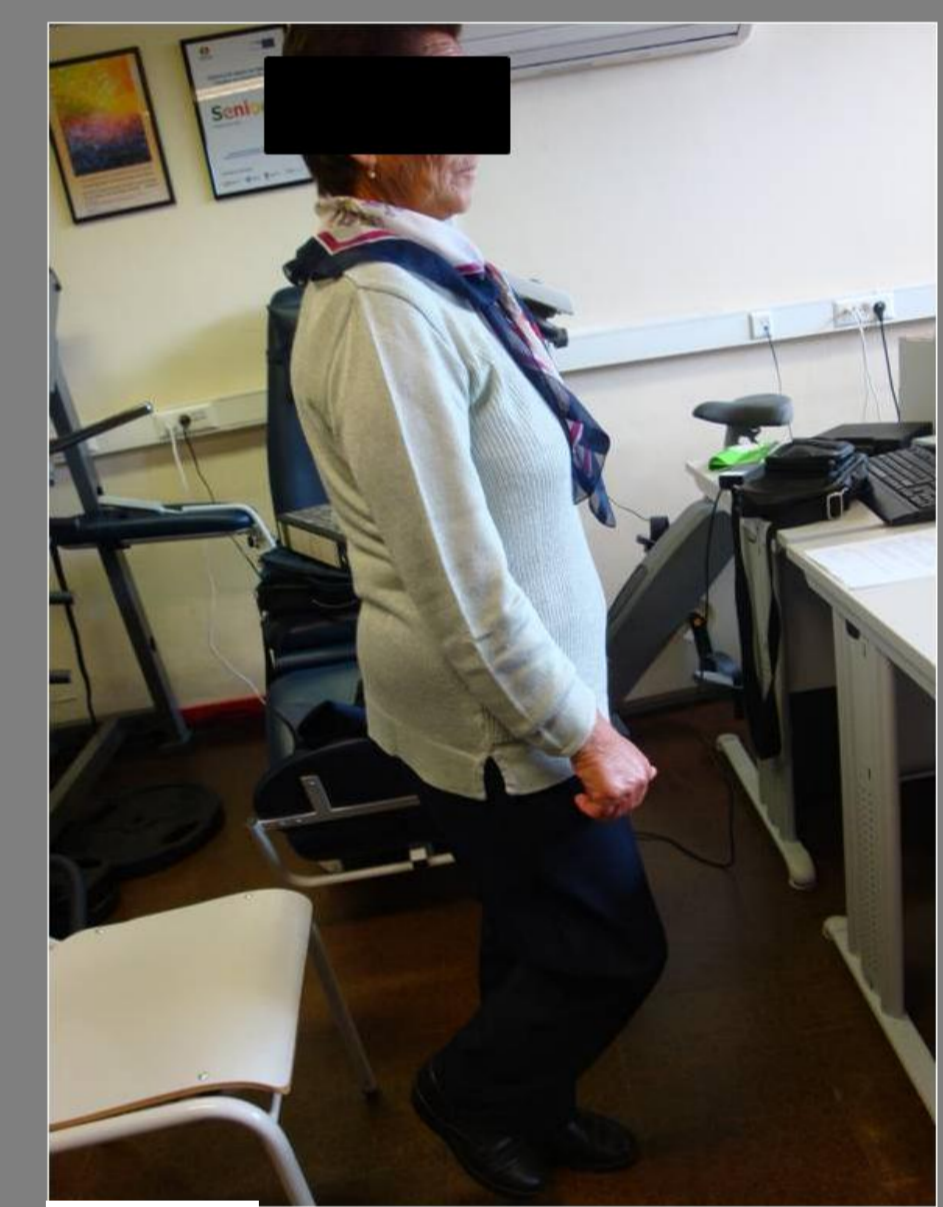


Fig. 6



Fig. 7



Fig. 8



Fig. 9

When comparing the subjects of our study with standard values for same age and sex, we observed reduced values with statistical differences in: 30 sec sit to stand, chair sit and reach, back scratch test, timed up and go test, handgrip and key pinch strength, bone mass in women and total muscle mass ($p < 0,05$). We also find statistical differences, but with higher values, in total body fat, visceral fat rating and BMI ($p < 0,05$).

Conclusion

We detected low levels of functionality at agility, flexibility and balance in association with a decrease in handgrip and key pinch strength. Also the findings regarding body composition are risk factors for morbidity, risk of falls and low-impact fractures.

Improving the functionality of the elderly population significantly reduces risk factors for falls, increasing also the activity and social participation which leads to improved self-esteem and self-image and a healthier life.

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