LOWER LIMB STRENGTH IN OLDER ADULTS WITH FRAILTY AND FALLS

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INTRODUCTION

The ageing process can cause loss of muscle strength. This can lead to reduced physical performance, functional independence and quality of life[1]. Frailty and falls are closely related geriatric syndromes associated with negative health related outcomes, such as increased hospitalisation rates and mortality[2].

OBJECTIVE

The aim of this study was to investigate relationships between lower-limb muscle strength and the variables of frailty criteria in older people with and without falls.

MATERIALS AND METHODS

The study included 55 community dwelling older adults: 12 (21.42%) men and 43 (78.58%) women. An inclusion criteria to this cross-sectional study were: age 65 or more years, unrestricted mobility, Mini mental state examination (MMSE) ≥ 21. Lower limb strength was evaluated by 5 time chair stand test. If participants took 15 or more seconds to perform the test they were classified as having lower limb weakness. Frailty status was defined using Fried's criteria: weakness, low walking speed, low physical activity, weight loss, exhaustion. Participants were classified as robust, prefrail and frail if they scored 0, 1–2, 3 points, respectively. History of falls was assessed by asking whether the subject had experienced falls in the past 12 months. Statistical analysis was carried out with SPSS 20.0 program for Windows. Normality of the data was evaluated with Shapiro – Wilk test. Correlation between lower limb strength between people with and without frailty and falls was assessed by Kruskal-Wallis test. Multinomial logistic regression was used to asses the odds of having frailty and falls if lower limb strength decreases.

RESULTS

Basic descriptive characteristics of study participants are summarized in Table 1.

Table 1. Basic descriptive characteristics of study participants

Characteristic	All participants (n = 55)	No lower limb weakness (n = 33)	Lower limb weakness (n = 22)	p
Age, years	78.25 ± 7.41	77.09 ± 7.86	80.41 ± 6.46	0.141
Number of women (%)	43 (76.8)	23 (69.7)	20 (90.9)	0.044
Height, cm	167.21 ± 7.75	168.86 ± 6.94	164.74 ± 8.39	0.064
Weight, kg	74.69 ± 12.95	75.03 ± 11.4	74.18 ± 15.23	0.824
BMI, kg/m^2	26.77 ± 4.78	26.3 ± 3.69	27.48 ± 6.1	0.425
Number of diseases	3.42 ± 1.97	2.79 ± 1.76	4.36 ± 1.94	0.004
Number of medications	4.78 ± 2.6	3.94 ± 1.62	6.05 ± 2.73	0.004
Polypharmacy (%)	34 (60.7)	18 (54.5)	16 (72.7)	0.172
Number of falls	1.64 ± 0.49	1.33 ± 0.65	2.09 ± 0.84	0.128
Frailty (score)	1.77 ± 0.56	1.27 ± 0.42	2.45 ± 0.53	0.006

BMI – body mass index

Mean age was 78.25±7.41 years, ranging from 65 years to 95 years. Out of all participants 22 (39.3%) were classified as having lower limb weakness, of which 2 (9.1%) were men and 20 (90.9%) were women. According to frailty status 13 (23.2%) participants were evaluated as being robust, 25 (44.6%) having pre-frailty and 17 (30.4%) were frail. Falls were reported in 34 (62.5%) participants. Frailty and falls were found in 16 (28.6%) participants: 5 (31.25%) men and 11 (68.75%) women.

Kruskal-Wallis test showed that there was a statistically significant difference in lower limb strength between the older people with and without frailty and falls ($\chi 2$ = 10.72, p = 0.013). Logistic regression revealed that even in adjusted analysis decreasing lower limb strength was associated with increased risk of having frailty and falls as shown in Table 2. No such association were found when comparing lower limb strength in only frailty or falls groups.

Table 2. Logistic regression for the association of lower limb strength, frailty and falls

	Odds ratio (95% CI)	p value
Frailty	0.81 (0.51-1.42)	0.232
Falls	0.39 (0.09-1.67)	0.206
Frailty and falls	1.27 (1.03-1.58)	0.034

Adjusted for age, sex, number of diseases and medications; 95% CI – 95% confidence interval

CONCLUSION

Results of our study shows that reduced lower limb strength was associated with increased risk of frailty and falling.

DISCLOSURE

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