

Influence of peripheral arterial disease on daily living activities in elderly women

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Aging has been associated with decreases in physical and cognitive functions. Peripheral artery disease (PAD) has been associated with further impairments in these functions, especially in women. However, no detailed information is available indicating whether PAD leads to further impairment in these functions in elderly women. Thus, the aims of this study were 1) to compare the capacity to perform daily living activities between elderly women with and without PAD and 2) to identify the factors related with the performance in daily activities. Twenty-seven elderly women with PAD and 22 elderly non-PAD women were surveyed in a geriatric hospital. Women aged ≥ 65 years and with no signal of dementia were included. PAD was identified by the ankle-brachial index ≤ 0.90 , whereas elderly non-PAD women presented ankle-brachial index > 1.0 . Patients were interviewed to obtain information regarding basic (Katz questionnaire) and instrumental daily living activities (Lawton-Brody scale) and performed the mini-mental state examination, handgrip strength test, and timed up and go tests. PAD and non-PAD women had similar age, clinical characteristics, handgrip strength test, and cognitive function ($P > 0.05$). The capacity to perform basic and instrumental daily living activities was similar between PAD and non-PAD women ($P > 0.05$). In PAD and non-PAD, the instrumental daily living activities were significantly correlated with cognitive function ($r = 0.44$, $P < 0.05$ and $r = 0.74$ and $P < 0.05$, respectively). PAD elderly women present similar capacity to perform basic and instrumental daily activities than non-PAD women. In addition, in both groups, the capacity to perform instrumental daily activities was related with cognitive function. (J Vasc Nurs 2016;34:39-43)

Peripheral artery disease (PAD) is a chronic disease that affects the structure and function of the arteries supplying the peripheral tissues of the human body.¹ PAD is associated with comparable morbidity and mortality and health economic costs with coronary heart disease and ischemic stroke.² The prevalence of PAD increases with age and a recent study indicated that it affects more women than men aged > 40 years of age.³ Interestingly, studies involving women with PAD are scarce in the literature.

PAD has been associated with impairments in physical activity levels and cognitive impairments, specially in elderly subjects.³ Interestingly, women with PAD had poor walking capacity,⁴ lower strength levels,⁵ and greater cognitive impair-

ment compared with men with PAD.⁶ Decreases in physical and cognitive functions in elderly subjects (≥ 65 years) have been associated with higher dependence to perform basic and instrumental activities of daily life.⁷ Thus, it is plausible that elderly women with PAD present a higher dependence to perform daily activities compared to elderly non-PAD women, which has not been previously described.

Given that information about disability is important to aware health professionals regarding the consequences of PAD, this study was designed to compare the capacity to perform daily living activities in elderly women with PAD and controls without PAD. In addition, we also assessed whether the capacity to perform daily activities in women PAD patients is related with functional and cognitive functions. Our hypothesis is that elderly women with PAD present higher dependence to perform daily activities in comparison with elderly non-PAD women.

METHODS

Sample

In this cross-sectional study, consecutive elderly women with PAD and without PAD were recruited in a Geriatric Hospital (Vila Mariana's unit of Hospital Israelita Albert Einstein, São Paulo-Brazil). Vila Mariana's unit of the Hospital Israelita Albert Einstein is specialized in the care of elderly over 65 years. The patients attended included institutionalized and community-dwelling elderly. In this unit, a multidisciplinary team (physicians, physiotherapists, psychologists, nurses, nutritionists and kinesiologists) provides optimal health and social support for elderly subjects (Table 1).

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The procedures of this study were in accordance with the ethical standards of the Hospital's Committee of Ethics for Analysis of Research Projects on Human Experimentation and with the Helsinki Declaration of 1975 (revised in 1983).

Subjects were included if they were woman, aged ≥ 65 years and did not present any signal of dementia according to the clinical evaluation. Women with PAD were identified by the ankle-brachial index ≤ 0.90 , whereas women without PAD were identified by ankle-brachial index > 1.0 . Patients with fracture and with severe ischemia (gangrene or ischemic pain at rest) were not included in this study. A total of 49 subjects attended inclusion criteria; among them 27 women presented PAD and 22 did not presented PAD, being considered controls.

All subjects were interviewed by a trained nurse who performed all data collection. Volunteers were interviewed to obtain information regarding basic and instrumental daily living activities. Moreover, all volunteers also performed the mini-mental state examination, handgrip strength test, and timed up and go test.

Data collection

Daily living activities were assessed using Katz' questionnaire (see Table 2) that contained six items on the ability to perform daily personal care activities and four items on mobility.⁸ For each questions, a dichotomy answer was provided (no, elderly who were unable to perform an activity without help or only with difficulties were considered limited regarding that task; and yes, elderly who were able to perform the task). A total score ranging from 0 to 6 points was also elaborated summing the number of yes. In elderly individuals, Katz'questionnaire presents a good internal consistency (Cronbach's alphas ranging from 0.73 to 0.78).⁹

To evaluate instrumental daily living activities, the Lawton-Brody scale (see Table 2) was used to evaluate functional activities based on eight items.¹⁰ For each questions, a dichotomy answer was provided (no, elderly who were unable to perform an activity without help or only with difficulties were considered limited regarding that

task; and yes, elderly who were able to perform the task). A total score ranging from 0 to 8 was also elaborated summing the number of yes. In elderly individuals with hip or wrist fracture, Lawton-Brody scale presents a good internal consistency of the eight items (Cronbach's alpha of 0.94).¹¹

The mini-mental state examination was conducted by asking subjects to solve 30 tasks within the categories: orientation, registration, attention, calculation, recall, and language. Correctly performed exercises are rated with 1 point, whereas the score for failure is 0. Participants can therefore obtain scores ranging from 0 to 30, with high scores being indicative of healthy subjects. In elderly subjects, the mini-mental present a good internal consistency (Cronbach's alpha above 0.80).¹²

Handgrip test was performed using a mechanical dynamometer, following previous recommendations.¹³ For measurement, subject sat with the feet touching the ground, the elbow flexed to 90°, and the forearm in neutral position. All subjects performed three grips with the dominant hand, and the highest value was used for analysis. In hypertensive subjects, handgrip test presents high reliability (intraclass coefficient correlation of 0.98).¹⁴

For the timed up and go test, subjects were required to rise from a chair and walk at normal gait speed around a cone eight feet away and then return and sit back down, as previously described.¹⁵ The time spent to perform this activity was recorded and used for analysis. In elderly subjects, timed up and go present high reliability (intraclass coefficient correlation of 0.91).¹⁶

Statistical analysis

Descriptive statistics was performed using frequency distribution and the mean \pm standard deviation. Independent *t* test was performed to compare PAD and non-PAD in continuous variables, whereas the association between the presence of PAD and each of daily living activity was analyzed using the Pearson chi-square test. Pearson correlation coefficient was used to assess the relationship between the capacity to perform daily living activity and

TABLE 1

CHARACTERISTICS OF THE SAMPLE

Variables	Non-PAD (n = 22)	PAD (n = 27)	P
Age, y	83.4 (7.4)	84.9 (8.4)	0.52
Body mass index (kg/m ²)	29.5 (4.6)	30.5 (8.0)	0.60
Ankle-brachial index	1.01 (0.10)	0.73 (0.20)*	<0.01
Handgrip, kgf	17.6 (8.9)	21.5 (11.7)	0.21
Timed up and go, s	14.9 (10.1)	12.7 (5.6)	0.32
Mini-mental state examination, pts	23.9 (6.0)	22.7 (6.3)	0.54
Current smoking, %	22.7	27.6	0.79
Diabetes, %	4.5	37.9*	<0.01
Coronary artery disease, %	0.0	6.9	0.21
Chronic pulmonary obstructive disease, %	13.6	10.3	0.72
Cancer, %	22.7	13.8	0.41

PAD = peripheral artery disease.

*Difference from elderly women control ($P < 0.05$).

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