

THE DECLINE IN PHYSICAL PERFORMANCE AND ONSET OF SARCOPENIA IS ASSOCIATED WITH THE DEVELOPMENT OF URINARY INCONTINENCE IN OLDER COMMUNITY DWELLING WOMEN

Hypothesis / aims of study

Urinary incontinence (UI) is the most common pelvic floor disorder affecting older women. Disabilities in physical function have been reported as a cause and consequence of UI.(1) The decline in physical function and UI symptoms become more prevalent with aging and little is known regarding the inter-relationship between these conditions. Insufficient serum vitamin D has been associated with both worse physical performance and a greater negative impact of UI symptoms in women.(2, 3) Consequently, vitamin D nutritional status may provide an important link between physical function and UI. Sarcopenia, the decline in muscle mass and function that occurs with age, may also impact the inter-relationship between physical performance and UI symptoms in women. We hypothesized that the development of UI symptoms in older community dwelling women would be associated with decreased physical performance, insufficient vitamin D, and sarcopenia. To test our hypothesis, we aimed to explore the longitudinal relationship between incident UI and changes in physical performance, sarcopenia, and vitamin D status in a cohort of older women from the Health, Aging, and Body Composition (Health ABC) study.

Study design, materials and methods

The Health ABC study is a longitudinal multi-centered study of older community dwelling men and women. This secondary analysis included healthy older women who denied current or past symptoms of UI within 12 months of baseline and for whom follow-up UI data at year 4 were available. Urinary incontinence type and severity was determined using validated questions. Measures of physical performance included the Short Physical Performance battery (SPPB), the 400 meter fast walk speed, and the 6 meter usual walk speed. Total serum vitamin D levels between 50-74 nmol/L defined insufficient status and <50 nmol/L defined deficient status. Appendicular skeletal muscle mass index (ASMI), the appendicular lean muscle mass/height (kg/m²), was calculated as a marker of sarcopenia. Sarcopenia was determined by the composite of having an ASMI <5.5 kg/m², usual walk speed <1 m/s, and hand-grip strength ≤ 20.5 kg. Univariate analyses were performed to observe changes in demographic, UI symptoms, and physical performance covariates at year 4 categorized by UI status at year 4 (incident UI vs. non-incident UI). Analysis of covariance examined differences in physical function decline among the groups with and without incident UI and logistic regression analyses evaluated the odds of developing sarcopenia among older women who develop UI symptoms.

Results

Of the 1,583 women in Health ABC, 673 (43%) were continent at baseline and included in this analysis. The mean age was 74.3 ± 2.9 years, BMI 27.2±5.5 kg/m², and 354 (53%) were African-American. A total of 223 (33%) developed UI symptoms, 107 (48%) with urgency UI and 38 (17%) with stress UI. The proportion of women with incident UI was equal among African-American and Caucasian participants (p=0.12). More women with incident UI used systemic estrogen therapy (39% vs. 30%, OR1.4 [1.0, 1.9]) and had higher depression scores (Center's for Epidemiologic Studies for Depression scale >16 (2.4% controls vs. 5.4% incontinent, p=0.04). Women who developed UI symptoms at year 4 were found to have greater decline in physical performance (SPPB) and standing balance scores (Table 1). Changes in usual (400 m) walk and fast (6 m) walk speed were similar between groups. Vitamin D nutrition status (deficient, insufficient, sufficient) were not significantly different among women with incident UI (OR 1.1, 95% CI [0.7, 1.6]). However, greater proportion of women with incident UI concomitantly developed sarcopenia (37% incontinent vs. 27% continent at year 4, (OR1.6 [1.0, 2.6]) and women with incident sarcopenia had higher odds of also developing UI at year 4 (OR 1.38 [0.95,2.01]).

Table 1. Mean and SD of physical performance measures adjusted for baseline values

Year 4	No incident UI n=450	Incident UI n=223	OR [95% CI]	p-value
SPPB	9.5 (2.0)	9.2 (2.2)	0.32 [0.04, 0.60]	0.02
Standing balance score	3.52 (1.0)	3.32 (1.1)	0.20 [0.05, 0.36]	0.009
400 meter walk (m/sec)	1.20 (0.2)	1.17 (0.2)	0.03 [-0.01, 0.04]	0.14
6 meter walk (m/sec)	1.04 (0.2)	1.02 (0.2)	0.01 [-0.02, 0.05]	0.44

Interpretation of results

We present a novel observation that physical performance and standing balance declined significantly in older women with incident UI. This association may be impacted by the concomitant development of sarcopenia and may not be mediated by vitamin D nutritional status.

Concluding message

Poor physical performance and balance increased with the development of UI symptoms in older women. This observed functional impairment may affect pelvic floor muscle function of older women plausibly impacting the efficacy of non-surgical treatment of UI. Robust prospective studies are needed to further characterize the interaction between these inter-related conditions.

References

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Disclosures

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