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IS THERE A RELATIONSHIP BETWEEN BALANCE OR LOWER EXTREMITY STRENGTH AND THE IMPACT AND/OR SEVERITY OF MIXED UI IN AGING COMMUNITY-DWELLING WOMEN?

Hypothesis / aims of study

Mixed urinary incontinence (UI) has been independently associated with increased falls among aging community-dwelling women. However, the association between UI severity and falls is not fully understood. Thus, the aim of this study was to explore possible relationships between balance or lower extremity strength and the impact and/or severity of mixed UI in aging community-dwelling women.

Study design, materials and methods

This report is a cohort study nested in a larger quasi-experimental cohort study characterizing and comparing pelvic floor muscle and physical fitness in aging, incontinent elderly women. Women aged 60 and over with mixed UI were recruited from five continence clinics. Urinary incontinence was defined as *a weekly average of one or more episodes of involuntary urine loss during the preceding 3 months*: a validated indicator of UI that has been used previously in quasi-experimental and randomized controlled trials. Mixed UI was establish using specific items on the Urogenital Distress Inventory (UDI) and confirmed by the referring physician. To be included in the study, women had to be 60 or older, ambulatory, have mixed UI as described above, and understand French or English instructions. Subjects were excluded if they presented other types of incontinence as confirmed by the treating physician's diagnosis and/or risk factors known to interfere with lower extremity strength or balance. Excluded subjects included those with terminal cancer, severe arthritis, dementia (Mini-Mental State Exam < 24), stroke, severe neurological and demyelinating diseases, myopathies, in-dwelling urinary catheters or an illness requiring hospitalization. After giving consent, the women were asked to complete two incontinence-specific questionnaires: the UDI to determine symptom severity and the Incontinence Impact questionnaire (IIQ) to gauge impact on quality of life (1). Participants were then asked to perform a timed unipedal stance test (UPST) and a sit-to-stand test (STS).UPST is a simple test measuring static aspects of balance: standing barefoot on the dominant leg with the other raised. Decreased UPST time has been associated with an increased risk of falls in aging women (2). The STS is also a commonly-used functional performance measure in clinical research. The test involves recording the number of repetitions achieved in a given period (e.g. 10 or 30 seconds). Performance on this test is often used as an indicator of lower-limb strength in older adults. STS times are reportedly associated with a person's standing and leaning balance, and mobility (3). To administering the UPST, the investigator used a stopwatch to measure the amount of time the subject could stand on one leg. The procedure was repeated three times with both the dominant and non-dominant leg; the average for each leg was recorded. For the STS test, the number of repetitions achieved over a 30-second period was recorded. The relationship between balance or lower extremity strength and the impact and/or severity of mixed UI in aging community-dwelling women were studied using Pearson's correlation coefficients.

Results

One hundred and ten women with mixed UI, aged 60 and over, were recruited for this study. Demographic data and the mean UDI, IIQ, UPST and STS test scores are shown in Table I. Pearson correlation coefficients and significance levels are shown in Table II.

Table I. Descriptive statistics: demographic data, UDI, IIQ, UPST and STS test scores

	Mixed UI women (n = 110)
Age	68.38 (6.24)
Parity	2.39 (2.09)
UDI	21.56 (10.71)
IIQ	5.14 (7.92)
UPST dominant	25.49 (20.73)
UPST non-dominant	23.30 (21.61)
STS	11.04 (3.17)

Table II. Correlation of the UDI, IIQ, UPST dominant, UPST non-dominant and STS in 110 mixed UI women

	UPST dominant	UPST non-dominant	STS
UDI	-0.076 (0.432)	-0.11 (0.256)	-0.196 (0.041)*
IIQ	-0.033 (0.731)	-0.115 (0.230)	-0.186 (0.052)

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Interpretation of results

There was a weak, significant correlation between UDI and STS scores. However, when dividing the mixed UI group in two (those between 60 and 70 years of age and those over 70), there was a moderate and very significant negative correlation between UDI and STS scores (n = 41; Pearson correlation coefficient – 0.472; p= 0.001**).

Concluding message

The findings suggest that women with more severe UI symptoms tend not to perform as well on the functional performance test: a relation that was more pronounced in women 70 and older. This correlation might have been higher if a more specific, incontinence

symptoms-only questionnaire (for example the ICIQ) had been used instead of the UDI, which includes lower urinary tract symptoms such as incontinence, urgency and prolapse. Clearly, more studies are needed to better understand the relationships between balance or lower extremity strength and the impact and/or severity of mixed UI in aging community-dwelling women, in particular their link with falls.

References
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Was the Declaration of Helsinki followed?	**Yes**
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