Introduction

Urinary incontinence (UI) is a common pathology estimated to affect more than 40% of women aged 69 or more. UI is most often mixed in elderly women combining stress and urge incontinence. After 65 years, UI has an impact on the quality of life higher than other morbidity chronic conditions. UI is a predictor of loss of independence and nursing home admission.

Association between aging and UI could be explained by the frequent physical disability in the elderly. Ngaard's investigation covering 5701 American women aged 50-69, found an association between UI and functional limitation that was proportional to the severity of UI. Palmer et al have shown that in women hospitalized for hip fracture, UI was associated with use before admission of a wheelchair or walker. In a cohort study in subjects over 70 years, the altered mobility of the lower limbs was associated with an increased incidence of mild UI. We can assume that age related functional impairment increases the risk of urge UI by increasing the time between the beginning of the need and the arrival to the toilet. It is also possible that UI is a barrier to physical activity and a factor favoring the functional impairment. In the survey of Brown, the risk of falls or fractures was associated with urge incontinence. Finally a common etiology might explain both UI and functional impairment.

In the elderly, functional impairment and dependency can be predicted by objective measures of physical performance and balance. These tests are used to screen for fragile elderly who could benefit from exercises to prevent dependency and falls. The "Ossébo" project proposed to female volunteers 75-85 years living at home an evaluation of physical performance and balance before inclusion in a program to prevent falls. Our goal in study of this population is to determine if the results of tests of motor and balance were associated with UI.

Population and Methods

Data used in our analysis are from the pre-inclusion in the study Ossébo a randomized controlled trial to prevent serious falls among elderly women with an exercise program. In each center women aged 75-85 years were invited to for a first visit. Our population is constituted of 1942 women tested between January 2008 and January 2010 in nine centers. The questionnaire used were a health-related quality of life questionnaire (SF36) and a questionnaire on IU (ICIQ-SF). We distinguished stress UI: leaks when you cough or sneeze or leaks when you are physically active/exercising, urge UI: leaks before you can get the toilet, and mixed UI (both). The tests used for the study were a timed 6-meter walk, the "timed up and go" test which measures the time taken to rise from a chair and walk 6 meters, turn around and sit down again; a test that measures the time taken to rise from a chair 5 times without using the hands; a test that assesses whether the woman can stand in a semi-lot (heel of the front foot against the toe of the back foot) more than 10 seconds; a walking tandem test assessing the ability of women to do four steps feet on line; and a standing balance test, which measures the time standing on one leg.

Results

The average age of the 1942 women tested was 79.3 years, 1258 (65.4%) live alone and 772 (39.7%) have fallen over the last 12 months. The ICIQ-SF UI score could be calculated in 1922 (99.0%) women, 1107 (57.0%) were continent (score = 0). Among the 815 continent women, the average ICIQ-SF score was 7.59 (± 4.14). In over half of the cases (57%) leaks occur daily. In most cases (76%), leakage is small. The disturbance mean is 3.04 (± 2.60) on a scale of 0 to 10. Among continent women, 194 (23.8%) had stress UI, 251 (30.8%) urge UI, and 302 (37.1%) mixed UI.

Bivariate analysis showed a deterioration in motor and balance tests according to the severity of UI (Table 1).

Discussion

In this large population of women aged 75-85, UI was common and usually mixed. There was a gradient between the degree of impairment of motor skills or balance tests and severity of UI. The alteration of tests was specific to urge UI.

The main quality of our study is that we used quantitative and functional tests well standardized that specifically measure walking ability and balance. Indeed, previous studies have shown an association between dependence and UI using questionnaires rather than an objective measure of physical ability. These objective measures of physical ability are predictive of a higher risk of fracture, cognitive impairment, or disability in the activities of daily living. These measures could allow screening for early physical alterations and allow early treatment to reduce the risk of dependency. The relationship observed in our study between these measures of motor and balance skills and severity of UI may explain why urinary UI is found as a risk factor of dependence and nursing home admission.

The combination of poor motor control and UI test and UI can be explained in several ways. Women who have difficulty walking take longer to get to the toilet, which increases the risk of leak in case of urge. Improving ability to perform alone a certain number of activities of daily living is associated with a remission of UI symptoms. Another explanation could be that women who suffer from urge UI are more likely to limit their activities so as not to go too far from the toilet. The progressive physical deconditioning which follows results in decreased physical ability. The association may be circular, it is known that after a fall, many women limit their activity for fear of falling which, again, will gradually lead to physical deconditioning. Another hypothesis is also possible: the existence of a common cause for the UI and physical disability, for example, certain neurological conditions responsible for peripheral and central disability (eg. stroke) or certain drugs that act on the neurologic system. Cognitive decline may reduce the feeling of need and thus promote full bladder leakage.

Our results give hope that improvements in walking and balance ability could reduce urge UI. Recent randomized controlled trials have shown that it is possible to improve walking and balance ability of older people through programs of adapted physical activity. It remains to be seen whether the practice of adequate physical activity also reduces the frequency of urge incontinence. The randomized controlled trial Ossébo, which includes two arms (exercises versus control), should provide some answers.

Conclusion

Our study shows that UI is a very common health problem among elderly women. Our results also show that there is a strong association between physical ability and UI that is proportional to the severity of UI. These results open new perspectives for the prevention and treatment of urge UI in elderly women.

Table 1. Urinary incontinence severity and motor/balance tests

Table 2. Urinary incontinence type and mobility/physical capability tests

Table 3. Urinary incontinence type and mobility/physical capability tests

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Thank you Jeffrey Arbour for English-language proofreading.