



Challenges and New Insights in the Management of Urinary Incontinence in Older Women

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Abstract

Purpose of Review This article highlights the potential challenges in the management of urinary incontinence in older women. **Recent Findings** Urinary incontinence is a highly prevalent condition associated with profound morbidity and psychosocial consequences especially among older women. Simple conservative approaches including life-style modification and behavioral management can be quite effective in improving urinary incontinence symptoms. However, options beyond first-line management are limited due to adverse effects related to medications or surgery.

Summary Urinary incontinence is a multifactorial condition in older women, and management is often complicated given multiple comorbidities and unique physiologic changes related to aging. The management should be individualized based on the patient's clinical history and goals of therapy. More research is needed to overcome current challenges associated with the management of urinary incontinence in older women. A treatment algorithm that provides safe yet effective treatment options specifically tailored to older women is needed.

Keywords Urinary incontinence · Geriatric syndromes · Older women · Incontinence · Pelvic floor disorder · Treatment

Introduction

In the older woman, urinary incontinence (UI), the involuntary loss of urine, may be considered a “Geriatric Syndrome,” which refers to a multifactorial and highly prevalent aging-related condition, leading to significant morbidity and disability. UI affects up to 50% of community-living older women and 80% of long-term care residents [1, 2]. UI is considered a top health priority as it is associated with increased hospitalization and long-term care admissions, independent of other comorbidities in the older population [3, 4]. Profound psychosocial consequences of UI have been well documented such as depression, isolation, and impaired social functioning, which lead to greater health risks and morbidities, including cognitive decline/dementia (50%

increase), cardiovascular disease/stroke (30% increase), and premature deaths [5–9].

The etiology of UI in older women is multifactorial and complicated by non-genitourinary conditions including decline in physiologic and cognitive function, such as dementia, mobility impairment, poor dexterity, and polypharmacy. Given the complexity of evaluation and treatment, a transdisciplinary approach is essential in providing comprehensive care in older women with UI. This article will discuss challenges associated with currently available treatment options for UI and potential areas of research to improve efficacy and safety of UI management specifically in older women with UI.

Management Goals

Management strategies should be individualized based on the patient's clinical history and goals of therapy, focusing on a patient's needs and improving quality of life (QOL). Despite the negative impact of UI, many older women do not seek care. Up to two-thirds of those reporting moderate to severe urinary leakage did not seek care for reasons including the misperception of UI being normal part of aging, embarrassment or

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shame, low expectations for treatment, and the belief that UI being a lower priority relative to other comorbid conditions [10]. In order to reduce the burden of UI, eliminate stigma, and promote care-seeking, it is important to raise awareness of the condition and treatment options available to those who suffer in silence. Another obstacle to help-seeking is that many providers fail to screen for UI. Healthcare providers should routinely ask patients about the presence of UI symptoms directly rather than relying on voluntary reporting. As the continence mechanism is multifactorial, depending on the genitourinary anatomy and neurologic components, as well as intact functional ability for toileting, it is necessary to identify conditions and risk factors that may predispose or contribute to UI. Clinicians should determine symptom severity, the frequency/amount of leakage, and characterize UI type, as the treatment typically depends on the type of UI.

Main UI Types

- i) Stress urinary incontinence (SUI): involuntary leakage of urine that occurs with increased intraabdominal pressure, such as coughing, sneezing, with exertion, or laughing in the absence of detrusor contractions. The etiology of SUI is structural, either urethral hypermobility due to insufficient urethral and bladder neck support or intrinsic sphincter deficiency, lack of urethral coaptation.
- ii) Urgency urinary incontinence (UUI): involuntary leakage of urine associated with urgency, or a compelling need to urinate which is difficult to defer. It is caused by detrusor overactivity.
- iii) Mixed urinary incontinence (MUI): having symptoms of both SUI and UUI.

Other types include overflow incontinence, where urinary leakage occurs in the setting of incomplete bladder emptying. This can be due to detrusor underactivity or bladder outlet obstruction. Patients with overflow incontinence reports symptoms that are similar to SUI and/or UUI. Neurogenic disorders such as spinal cord disorders, Parkinson's disease, stroke, multiple sclerosis, and normal pressure hydrocephalus, as well as diabetic neuropathy can cause neurogenic bladder and incontinence. Functional incontinence is when a patient is unable to void in a timely manner due to functional and mobility impairment, while the physiologic and anatomic continence mechanism is intact.

Traditional Behavioral Therapy and Pelvic Floor Muscle Training

First-line treatment for UI includes behavioral management, which consists of multiple components including reduction in bladder irritants, fluid management, life style changes, timed

voiding, and bladder training with delayed voiding, all targeting change in the patient's behavior to help reduce UI symptom burdens. Pelvic floor muscle training is used concomitantly with behavioral management, which has been shown to be effective in treating stress and urgency UI symptoms.

Pelvic floor muscle exercises for SUI focus on strengthening the pelvic floor muscles to provide structural support for the urethra and bladder neck to increase urethral closure pressure and reduce pelvic floor and bladder neck descent, preventing urinary leakage associated with increased intra-abdominal pressure. In addition, contracting pelvic floor muscles and increasing the urethral pressure reflexively reduces detrusor muscle contractions via neuromuscular activation, therefore improving UUI symptoms. Women with SUI undergoing pelvic floor muscle training were significantly more likely to report being "cured" (relative risk [RR] 8.38, 95% confidence interval [95%CI]: 3.68–19.07) or "improved" (RR 6.33, 95%CI: 3.88–10.33), compared to no-treatment [11]. In women with any type of UI, findings were similar ("cured" RR 5.34, 95%CI: 2.78–10.26 and "improved" RR 2.39; 95%CI: 1.64–3.47); though the magnitude of cure or improvement was not as robust as women with SUI only. Frequency of UI episodes and QOL improved significantly with pelvic floor muscle training in women with SUI as well as any type of UI in the pelvic floor muscle training group [11]. One of the advantages of pelvic floor muscle training is that it is well-tolerated, and adverse events are rare.

Although these first-line treatment approaches such as pelvic floor muscle exercises are safe, they require active participation of a motivated patient and skilled providers to ensure that proper techniques are used with correct muscle group isolation and postures. Improvement in UI symptoms is often gradual and heavily relies on patient self-management and program adherence to sustain benefit, thus regular follow-up is often necessary.

Pelvic floor muscle exercises were initially developed to control UI in women following childbirth with the premise that strengthening pelvic floor muscles would provide stable pelvic floor support and function that are responsible for the continence mechanism. Despite the relatively robust data available on the overall efficacy and safety of pelvic floor muscle exercises in women with UI, there is a lack of data specific to older women. As a similar protocol is used in women across all age groups, it neglects addressing unique aging-related physiologic changes, specifically, decline in overall muscle strength as well as physical and cognitive functional declines that are very common among older women. Thus, there is a critical need to assess the impact of factors associated with aging-related functional decline on pelvic floor muscle training to optimize exercise strategies for older women with UI.

Common Link Between UI and Falls

UI and Falls are part of “geriatric syndromes” associated with significant morbidities and mortality in older adults [12]. UI was shown to be independently associated with increased fall risk (1.3–2.3 fold) [13–16]. Falls result in increased hospitalization, decline in long-term functional status, and loss of independence among older adults [17–21]. There appears to be a dose response relationship between UI and falls, as well as UI being a strong predictor of falling among hospitalized older adults [22, 23]. Traditionally, the association between falls and UI was assumed because of “rushing to the bathroom.” However, the current evidence no longer supports this simplistic explanation [24•, 25, 26]. Both conditions share multiple risk factors, including decreased skeletal muscle strength/mass, impaired mobility, and altered gait [15, 17, 27, 28•, 29, 30, 31•, 32]. Furthermore, evidence-based fall prevention and UI interventions share multiple key components such as hip and lower extremity muscle strength exercises focusing on intensity, duration, and coordination. In addition, growing evidence suggests that improving global physical function and strength may reduce the incidence of UI [33, 34]. The continence mechanism relies on intact pelvic floor support consisting of pelvic floor muscles and connective tissue which are anchored to the bony pelvis. Thus, anatomic structures beyond the pelvic floor may play an important role in maintaining pelvic floor muscle strength and function responsible for continence through co-activation of surrounding structures [35, 36].

New Insights Regarding Pelvic Floor Muscle Training

Existing data supports the positive impact of hip muscle exercises on pelvic floor muscle strength. The obturator internus is a hip external rotator, which shares a fascial attachment with the pelvic floor muscles. Strengthening the hip external rotators has been shown to improve intravaginal squeeze pressures, which is a validated objective measure for voluntary pelvic floor muscle contraction involved in traditional pelvic floor exercises for the treatment of UI. Previous studies demonstrated that after a 12-week hip exercise program focusing on hip external rotation without pelvic floor muscle exercises, intravaginal squeeze pressures increased both in young healthy women ($n=20$, ages 18–35, baseline: 24.2 ± 3.7 to 12 weeks: 35.4 ± 3.1 cmH₂O, $p < 0.05$) and postmenopausal women ($n=25$, ages 55 or older, baseline: 21.5 ± 2.6 to 12 weeks: 29.1 ± 3.2 cmH₂O, $p < 0.001$) [37, 38]. No intergroup pre- to post intervention differences were noted in intravaginal squeeze pressures or hip strength between age groups.

Further research is needed to examine the role of surrounding structures, such as hip muscles on pelvic floor function and strength to potentially optimize the efficacy of pelvic floor muscle exercises specifically tailored to older women with UI.

Beyond the First-line Behavioral Management

Most approaches beyond the first-line treatment of UI are often not ideal for older women as they have increased risk for adverse events from pharmacologic therapies and/or surgical interventions due to comorbidities and diminished physiologic reserve.

Pharmacotherapy

Currently no oral medications are approved by the United States Food and Drug Administration (FDA) for the treatment of SUI. For UUI symptoms, there are two classes of medications; antimuscarinic and beta-3 adrenergic agents.

Antimuscarinic medications have been shown to provide a modest benefit over placebo (median “cure” rate 49%, interquartile range [IQR] 36–58%) for the treatment of UUI. No significant difference in the efficacy was noted among different antimuscarinic agents [39]. Although the overall rate of medication discontinuation due to adverse effects are relatively low (1–6%) [40], there are potential adverse effects that limit the use of these agents especially in older women. Anticholinergic effects include xerostomia, constipation, blurred vision, drowsiness, and decreased cognitive function. Anticholinergic medications on cognitive function are of significant interest especially in older adults. Of the currently available antimuscarinic medications, darifenacin and trospium chloride are thought to have reduced adverse impact on the central nervous system due to their chemical properties (decreased ability to cross the blood brain barrier). However, there is no robust data that confirms the safety of these agents in this vulnerable population. As older women may have increased co-morbidities and polypharmacy, anticholinergic side effects are concerning. In a nested case control study of 58,769 patients with dementia compared to 224,457 controls (55 years or older), there was a slightly increased risk of dementia associated with exposure to anticholinergic agents over the prior 1–11 years (adjusted odds ratio [OR] 1.65, 95%CI: 1.56–1.75) [41••]. In another population based prospective cohort study of 3,434 participants, those in the highest anticholinergic medication exposure category (corresponding to oxybutynin chloride 5 mg daily for more than 3 years) were associated with an

increased risk of dementia (adjusted hazard ratio [HR] 1.54, 95%CI: 1.24–1.96) and Alzheimer's disease (adjusted HR 1.63, 95%CI: 1.24–2.14) compared to no use [42]. Given the methodology of existing studies, causation between anticholinergic exposure and the development of dementia cannot be determined; however, this association is notable.

Mirabegron, a beta-3 agonist, is another pharmacologic agent for the treatment of overactive bladder and UUI. It is considered a “safer” option for older women as there are no anticholinergic adverse effects, especially cognitive function or central nervous system effects given its pharmacokinetics. Adverse effects of mirabegron include headache and cardiac effects, most notably increasing blood pressure. Thus, mirabegron should be avoided in those with uncontrolled hypertension. In a pooled analysis of 668 persons aged 65 and older, treatment of emergent hypertension was seen in 14% of those on mirabegron 25 mg, 10% on mirabegron 50 mg, compared to 8% on placebo [43]. Efficacy of mirabegron versus antimuscarinic medications do not differ based on existing systematic reviews [44, 45].

The overall consensus regarding pharmacologic management in older women with UUI or overactive bladder is that the lowest effective dose of medication should be prescribed, and alternative options such as mirabegron should be considered to reduce anticholinergic burden [46, 47••]. However, this can be challenging, especially as the cost of mirabegron is often considerably higher even with insurance coverage compared to some of the generic antimuscarinic agents.

Other Treatment Options

Pessaries

Continence pessaries are intravaginal devices used to treat SUI in older women. The most common type is an incontinence ring pessary, which has a knob that is placed under the urethra to provide support (Fig. 1). Due to vaginal atrophy and smaller genital hiatus, fitting a pessary in older women for SUI may be difficult. Once successfully fit, those who elect not to continue with pessaries will typically do so within the first few weeks of fitting. [48] The initial continuation rate (6 months) ranges from 60 to 92% [49–51], however this rate declines over-time to < 15% over 10 years [52]. For older women who are unable to perform self-care (removal and reinsertion), regular follow-up visits for pessary maintenance are important to prevent complications, such as vaginal epithelial abnormalities, excoriations, erosions, as well as pessary incarceration and fistula to surrounding organs (bladder or rectum), although rare. Risk factors of serious complications include older age and cognitive impairment. Therefore,



Fig. 1 Incontinence ring pessary (with knob)

patient education (patient, care-giver, family members) is essential in preventing complications. To prevent discomfort and vaginal complications, vaginal estrogen should be considered in older women without contraindications.

Beyond Conservative Management of UI in Older Women

SUI Management

For older women whose SUI symptoms do not improve with conservative management and who accept risks of surgery, surgical management, such as a midurethral sling, is an option. Surgical management is associated with significantly higher rates of success compared to conservative management.

UUI Management

In older women who have persistent UUI despite conservative treatments or unable to tolerate pharmacologic therapy, third-line treatment options should be discussed. Factors that influence treatment selection include the goals of therapy/patient preference, efficacy, safety, time commitment, and insurance coverage. Currently available third-line treatment options for UUI include:

1. Intradetrusor injection of botulinum toxin: A median duration of therapeutic effect of botulinum toxin is 8–10 months [53, 54]. Adverse effects include temporary uri-

nary retention (up to 6.5%) and urinary tract infection (up to 35%) [55–57].

2. Sacral neuromodulation: This electrical stimulation therapy requires a lead insertion into the S3 foramen with a pulse generator implanted in the buttock. Adverse events include device malfunction, buttock pain, stimulation discomfort, infection, lead migration, or lack of efficacy.
3. Percutaneous tibial nerve stimulation: This is another type of electrical stimulation therapy that involves placement of an acupuncture-type needle by the medial ankle to deliver electrical stimulation for 30 min. These sessions are offered in a clinical setting, once a week for 12 consecutive weeks followed by maintenance sessions, typically once a month, but can be less frequent. Adverse events are rare, and the efficacy is similar to pharmacologic therapies (60%). The most common reason of the lack of efficacy is non-compliance due to frequent clinic visits [58–60].

Existing data is conflicting regarding the differential impact of age on treatment responses in women with UUI undergoing third-line treatments. While botulinum toxin injection and sacral neuromodulation have been shown to result in significant decrease in UUI symptoms in both young and older women, some studies demonstrated that greater improvement was noted in younger women, whereas others found no age discrepancies [61, 62, 63].

Conclusion

UI is a physically and psychosocially debilitating condition which negatively impacts QOL. Many women with UI are reluctant to seek care and feel succumbed to the condition. Despite the high prevalence of UI among older women, treatment options are currently limited. Given the detrimental impact of UI, it is critical to provide safe yet effective treatment options utilizing a transdisciplinary approach. Further research is needed to develop an evidence-based management algorithm for UI specifically tailored to older women, addressing unique physiologic changes associated with aging.

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Compliance with Ethical Standards

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