Urinary incontinence

By Dr Luke Bereznicki

Learning objectives

After reading this article you should be able to:

- Define the main presentations of urinary incontinence.
- Discuss the role of non-pharmacological treatment options in urinary incontinence.
- Discuss the range of medications available to improve the symptoms of urinary incontinence.

Competency standards (2010) addressed:

4.2.2, 7.1.2, 7.1.3, 7.2.2.

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Case study

Kate is a 62-year-old kindergarten teacher. At least weekly she has a strong sense of urgency to urinate that is followed by urinary leakage when she rushes to the bathroom during her lunch break. She also infrequently leaks drops of urine while exercising. Kate’s body mass index is 31 and she has mild hypertension, for which she is treated with amlodipine. She is planning to see her general practitioner about her symptoms next week. How should she be managed?

Introduction

Urinary incontinence is one of the most common chronic medical conditions seen in primary care, but it receives less attention than diabetes, Alzheimer’s disease and many other conditions that are less prevalent. Urinary incontinence is defined by the International Continence Society as the complaint of any involuntary leakage of urine. An estimated four million Australians are affected by urinary incontinence to some degree. The published prevalence of urinary incontinence in Australian adults living in the community ranges from 2.2% to 13.0% in men and from 19.3% to 37.0% in women (depending on the definitions used and measures of severity) with a higher prevalence in people aged over 65 years.

Incontinence is under-reported, and people often delay seeking help. This is often due to embarrassment or the belief that incontinence is a normal part of the ageing process, and a lack of awareness that effective treatment is available.

The prevalence is much higher in those living in residential care and institutions; between 32% and 78% of adults living in long-term care facilities are estimated to experience urinary incontinence. Incontinence is considered a significant predictor for institutionalisation of the elderly. Urinary incontinence has both physical and psychological consequences, including damage to skin, urinary...
Urinary incontinence occurs when there is dysfunction in either the storage function of the bladder or in the emptying function of the lower urinary tract. There are five main types of urinary incontinence, the classification of which are based on the presentation and cause (see Table 1). In women, stress incontinence and urge incontinence are the two most common types of urinary incontinence; in men overflow incontinence and urge incontinence are the most common.9

**Pathophysiology**

### Stress incontinence

Stress incontinence is defined as the involuntary loss of urine occurring when, in the absence of a detrusor contraction, the intravesical pressure exceeds the maximum urethral pressure.10 Stress incontinence results from weakness of the pelvic floor muscles and bladder neck and is associated with obesity, pregnancy, vaginal delivery and hysterectomy in women.11,12 In men, it may occur as a consequence of prostatectomy.13 The failure of the sphincter to maintain closure pressure is generally due to muscle or nerve damage, age-related denervation of muscle, changes in collagen and elastin as a result of birth related damage, genetic factors or declining hormonal status.9 Stress incontinence is experienced as the involuntary loss of urine during physical activity which increases intra-abdominal pressure (e.g. sneezing, lifting or jumping).

### Urge incontinence

Urge incontinence is defined as involuntary urinary leakage accompanied by or immediately preceded by urgency. It results from uncontrolled detrusor contractions which overcome urethral resistance.1 People with urge incontinence typically experience involuntary voiding of large volumes of urine due to uninhibited contractions of the detrusor muscle. They experience a strong desire to void urine (urgency), which may be accompanied by frequency and nocturia. Increasing age, female sex, obesity, impaired functional status, depression, recurrent urinary tract infection, diabetes, some neurological disorders and bladder symptoms in childhood are associated with overactive bladder syndrome (or overactive bladder), which may occur with or without urge incontinence.14,15 Detrusor overactivity may be caused by a neurological disorder (e.g. spinal cord injury, multiple sclerosis or stroke) or by bladder abnormalities such as infection, but it is common for no cause to be identified.16

### Overflow incontinence

Overflow incontinence involves the involuntary loss of small amounts of urine from a full bladder.9 Patients may have a range of symptoms including constant or frequent dribbling, frequent urination and nocturia. These symptoms may occur as a result of blockage of the bladder outlet (e.g. benign prostatic hypertrophy, prostate cancer, urethral stricture, renal stones), the inability of the detrusor muscle to generate adequate closure pressure or the use of alpha-agonists or anticholinergic medications in men with subclinical bladder obstruction.9

### Mixed and functional incontinence

Many people with urge incontinence also report stress incontinence (mixed incontinence). Treatment should focus on the predominant symptom.16 Functional incontinence, caused by cognitive impairment, reduced mobility, reduced manual dexterity or depression, also commonly accompanies urge or stress incontinence.

### Management

The aims of treatment are to reduce symptoms and improve quality of life. Factors that contribute to incontinence should be identified and managed.
Obesity is associated with an elevated risk of urge and stress incontinence, so weight loss is advisable. In one study, an intensive six-month weight loss program (mean weight loss of 8 kg) reduced incontinence episodes by almost half (from an average of 24 to 13 episodes per week) in overweight and obese women with urinary incontinence. Constipation may contribute to incontinence by straining pelvic floor muscles and treatment may improve symptoms. Modifying the fluid intake may assist if intake is excessive or insufficient. A reduced fluid intake may result in overly concentrated urine which may irritate the bladder and worsen incontinence. On the other hand, a decrease in fluid intake by around 25% if intake is excessive may improve symptoms in urge and stress incontinence.

Reducing caffeine intake may assist patients with overactive bladder syndrome or urge incontinence. Urgency and frequency were reduced in men and women who limited their intake to a maximum of 100 mg per day (approximately two cups of weak instant coffee) in one study.

Table 2 shows a list of medications that may cause or worsen incontinence. Where possible, these medications should be stopped, replaced or have their dosing regimen modified. Paradoxically, some medications that cause or contribute to some types of urinary incontinence may be used to treat another type of urinary incontinence.

### Physical and behavioural therapies

Pelvic floor training involves strengthening the pelvic floor muscles. It is the first-line treatment for stress or mixed incontinence in men and women and may be part of the treatment plan for urge incontinence. It is recommended that pelvic floor exercises are trialled for at least three months. They can also be used to reduce the risk of incontinence following childbirth. The evidence for pelvic floor exercises is less clear in men as most studies have been conducted before or after prostatectomy; however, the available evidence suggests that they are still likely to be beneficial. Bladder training is first-line treatment for men and women with urge incontinence as it is noninvasive, inexpensive and can be relatively easily implemented. The aim of this training is to re-establish voluntary bladder control and increase bladder capacity. Bladder training may include pelvic floor exercises, scheduled voiding with gradual increases in the duration between voids, and urge suppression techniques with distraction or relaxation. It is recommended that bladder training be trialled for a minimum of six weeks.

While effective in older people, pelvic floor and bladder training may be inappropriate in frail elderly people and those with cognitive impairment. Prompted (carers ask regularly about the need to go to the toilet) and timed voiding programs can be used for people with stress and urge incontinence who are not able to toilet independently (e.g. those who are cognitively impaired or frail).

### Pharmacological therapies

A range of medications may be used in the management of urinary incontinence. These include anticholinergics, selective alpha-blockers, oestrogens, duloxetine and 5-alpha-reductase inhibitors.

### Anticholinergic medications

Anticholinergic medications are the basis of pharmacological treatment in urge incontinence and may be used

<table>
<thead>
<tr>
<th>Medication</th>
<th>Mechanism</th>
<th>Type of incontinence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha agonists</td>
<td>Constrict the bladder outlet, voiding difficulty</td>
<td>Overflow</td>
</tr>
<tr>
<td>Alpha antagonists</td>
<td>Relax the bladder outlet</td>
<td>Stress</td>
</tr>
<tr>
<td>ACE inhibitors</td>
<td>Drug-induced cough</td>
<td>Stress</td>
</tr>
<tr>
<td>Anticholinergics*</td>
<td>Relax bladder contractions, voiding difficulty, constipation</td>
<td>Overflow</td>
</tr>
<tr>
<td>Beta agonists</td>
<td>Relax the bladder outlet</td>
<td>Stress</td>
</tr>
<tr>
<td>Beta blockers</td>
<td>Constrict the bladder outlet, voiding difficulty</td>
<td>Overflow</td>
</tr>
<tr>
<td>Calcium channel blockers</td>
<td>Relax bladder contractions</td>
<td>Overflow</td>
</tr>
<tr>
<td>Cholinergics</td>
<td>Increase bladder contractions</td>
<td>Urge</td>
</tr>
<tr>
<td>Cholinesterase inhibitors</td>
<td>Increase bladder contractions</td>
<td>Urge</td>
</tr>
<tr>
<td>Diuretics</td>
<td>Increase urine volume</td>
<td>Urge</td>
</tr>
<tr>
<td>Opioids</td>
<td>Reduce bladder contractions, confusion, constipation</td>
<td>Overflow, functional</td>
</tr>
<tr>
<td>Psychotropics</td>
<td>Constipation, confusion, sedation, Parkinsonism</td>
<td>Overflow, stress, functional</td>
</tr>
<tr>
<td>Anticholinergic effects, confusion, sedation, Parkinsonism, impaired mobility</td>
<td>Sedation, immobility</td>
<td>Overflow, functional</td>
</tr>
<tr>
<td>Increase bladder contractions, sedation</td>
<td>Urge, functional</td>
<td></td>
</tr>
<tr>
<td>Increase bladder contractions, sedation, immobilty</td>
<td>Overflow, functional</td>
<td></td>
</tr>
</tbody>
</table>

*Including drugs with significant anticholinergic effects, e.g. some antidepressants, first-generation antihistamines.
in combination with bladder training or as monotherapy if bladder training is unsuccessful or impossible.\(^{24,25}\) They act by blocking muscarinic receptors in the bladder, reducing bladder muscle contractility. The most commonly prescribed anticholinergic in Australia is immediate-release oxybutynin.\(^7\) A transdermal formulation of oxybutynin is also available and is listed on the PBS for people unable to take tablets. Newer, more uroselective agents include solifenacin and darifenacin. There is no evidence that these agents are more effective than oxybutynin, and they are not currently listed on the PBS. Other anticholinergics available in Australia indicated for urge incontinence include tolterodine and propantheline.

Anticholinergic medications are effective in reducing the number of episodes of incontinence per day (by about 1.5 per day on average) and the number of voiding episodes per day (by about 2.2 on average).\(^{26}\) In two trials, the decrease in the number of incontinence episodes with extended-release oxybutynin and extended-release tolterodine (not currently available in Australia) was greater than with immediate-release tolterodine, although the difference in efficacy was small.\(^{26}\) Anticholinergics may also improve quality of life and reduce distress due to urine leakage.\(^{24}\) Elderly people are more susceptible to adverse effects such as blurred vision, dry mouth, constipation and confusion. Anticholinergic agents should be avoided in people with dementia because of the risk of cognitive decline and delirium.\(^{27}\) Around one in three patients taking anticholinergic medications report dry mouth, but symptoms are generally reported as mild.\(^{24}\) While the anticholinergics are regarded as having broadly similar efficacy, there may be differences in the incidence of adverse effects. Tolterodine is less likely to cause dry mouth than immediate-release oxybutynin,\(^{26}\) as is extended-release oxybutynin.\(^{26}\) Darifenacin and solifenacin are more uroselective than oxybutynin, and are also less likely to cause dry mouth.\(^{26}\)

**Selective alpha blockers**

Alpha blockers are mainly used to relax bladder and prostate smooth muscle in men with benign prostatic hypertrophy (BPH). Alpha blockers (e.g. prazosin, tamsulosin, terazosin and alfuzosin) have similar efficacy in improving urinary flow rate, and their effect is maximal within a month of treatment.\(^{28}\) Tamsulosin and alfuzosin have less effect on blood pressure than terazosin and prazosin, and may be better tolerated.\(^{28}\)

**5-alpha-reductase inhibitors**

Finasteride and dutasteride reduce prostate volume, and improve symptoms and urinary flow rate in BPH. They are a treatment option when the size of the prostate exceeds 30–40 cm\(^3\) and are generally used in combination with a selective alpha-blocker as it may take six months of treatment to improve symptoms if they are used alone.\(^{29}\) The limited short-term evidence suggests that there are no major differences between finasteride and dutasteride in the degree of prostate size reduction, symptom improvement, urinary flow rate or in the incidence of adverse effects.\(^{29}\)

**Other medications for incontinence**

Duloxetine, a serotonin and noradrenaline reuptake inhibitor currently approved in Australia for depression, anxiety and diabetic neuropathy, may also be an effective treatment for stress incontinence. A recent meta-analysis found that duloxetine decreased the frequency of episodes of stress incontinence and improved quality of life.\(^{30}\)

Imipramine may be used to reduce detrusor contractility and increase outlet resistance in urge incontinence.\(^{7}\) The role of alpha agonists (e.g. clonidine) for urinary incontinence is limited, and not supported by rigorous studies.\(^{31}\) Postmenopausal oestrogen treatment was previously believed to decrease the symptoms of urinary incontinence. However, recent data demonstrates that women taking oral hormone replacement therapy (HRT) have a significantly higher risk of stress and urge incontinence than women taking placebo.\(^{32,33}\) Oral HRT may also worsen the severity of pre-existing urgency incontinence. Intravaginal oestrogen, on the other hand, may improve symptoms of urinary incontinence in postmenopausal women.\(^{32}\)

**Other management options**

A range of absorbent products (pads and pants) and toileting aids (e.g. handheld urinals) may be used as adjuncts to treatment or for long-term management of symptoms that do not respond to treatment. Catheterisation may be considered for men and women whose incontinence is secondary to chronic urinary retention.\(^9\) The choice of method (e.g. intermittent self-catheterisation or long-term indwelling catheterisation) depends on the patient’s (and/or carer’s) choice and the risk of potential complications. Other non-pharmacological treatment options include biofeedback, insertion of mechanical devices, neuromodulation, urethral injections or surgery.

**Conclusions and recommendations**

In the above case, it appears that Kate has symptoms of mixed urinary incontinence, but her most troublesome symptom seems to be urge urinary incontinence. She should see her GP to determine a treatment plan, which might include completion of a voiding diary and, if present, infrequent voiding or excessive fluid or caffeine intake should be addressed. Weight loss may also be beneficial in reducing incontinence episodes. Behavioural therapies, such as pelvic floor training and bladder training should be considered as first-line therapy. If symptoms do not improve, an anticholinergic medication could be considered. It would be worth asking Kate about her bowel function, as constipation may be a contributor to her incontinence. Dihydropyridines (e.g. amlodipine) are less likely than other calcium channel blockers to cause constipation, but it might be worth considering this as a potential contributor to constipation, if it is present. Kate may wish to consider, if she hasn’t already, absorbent products for use when exercising.

Urinary incontinence is one of the most common chronic medical conditions seen in primary care. Pharmacists are well placed to offer patients with urinary incontinence advice on lifestyle modifications, behavioural therapies and medication to improve their symptoms, and make recommendations to prescribers regarding their patients’ medications, which often contribute to symptoms.
Continuing Professional Development

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Questions

1. Which ONE of the following types of urinary incontinence best fits this description: ‘involuntary leakage associated with urgency and also with exertion, effort, sneezing or coughing’?
   a) Stress.
   b) Urge.
   c) Overflow.
   d) Mixed.

2. All of the following groups of medications are potential causes or contributors to urinary overflow incontinence, EXCEPT for:
   a) beta-blockers.
   b) calcium channel blockers.
   c) diuretics.
   d) alpha-agonists.

3. Which ONE of the following treatment options should generally be used first-line in urinary urge incontinence?
   a) Bladder training.
   b) Oxybutynin tablets.
   c) Oxybutynin transdermal patch.
   d) Alfuzosin.

4. Duloxetine, although not currently indicated for the treatment of urinary incontinence, has been shown to be effective in which ONE of the following?
   a) Stress incontinence.
   b) Urge incontinence.
   c) Overflow incontinence.
   d) Mixed incontinence.

5. Which ONE of the following statements regarding pelvic floor exercises is FALSE?
   Pelvic floor exercises:
   a) are part of the treatment plan for urge incontinence.
   b) are first-line treatment for stress or mixed incontinence.
   c) are only effective in women.
   d) should be trialled for at least three months.

References