

STRESS INCONTINENCE IN PRE-MENOPAUSAL WOMEN

Urinary incontinence is a common and distressing condition, which is significantly more common in women than in men. In this review, the authors focus on the investigation and management of stress urinary incontinence among younger women.

Bhawana Purwar MBBS, MRCOG, DFRSH, PGCert Medical Ultrasound

Jason Cooper BSc, MBBS, FRCOG, MD
Department of Obstetrics & Gynaecology University Hospital of North Staffordshire

Urinary incontinence (UI) – the involuntary loss of urine – is a significant healthcare problem. The prevalence of severe incontinence in the general population has been estimated to be 7%.¹ UI has a negative impact on all aspects of quality of life, even after controlling for co-morbidities and demographic variations,² with 10% of women with incontinence reporting their symptoms to be greatly bothersome.¹ In spite of its common occurrence, only a quarter of patients with any incontinence and half of patients with severe incontinence consult a doctor.³ Common forms of UI are stress urinary incontinence (SUI), urge urinary incontinence (UUI) and mixed urinary incontinence.

SUI – involuntary urinary leakage on effort or exertion, or on sneezing or coughing – is the most common cause of UI in premenopausal women.¹ The annual incidence of SUI has been estimated to be between 4% and 10%,⁴ peaking in women aged between 45 and 49 years.¹ Risk factors among middle-aged women include white race, increased age, high body mass index, multi-parity, current smoking, type 2 diabetes mellitus and previous hysterectomy.⁵ Obstetric risk factors include diabetes mellitus, high body mass index (BMI), older age at first delivery, multi-parity

and high birth weight.⁶

The pathophysiology of SUI is unclear. Typically it occurs when the intra-vesical pressure exceeds the intra-urethral pressure in the absence of excessive detrusor contractility. SUI may therefore occur if there is an increase in the intra-vesical pressure, (e.g. due to pregnancy, chronic cough or abdominal malignancy), or if there is reduced intra-urethral resistance due to damage to the urethral sphincters (external or internal) or urethral support structure (e.g. following intrapartum trauma or urethral scarring through previous surgery). Trauma during delivery or urogenital prolapse can cause damage or weakening of the pubourethral ligaments or pelvic floor musculature, leading to hypermobility of the bladder neck or pelvic denervation. Hypermobility of the bladder neck results in incomplete closure of the proximal urethra, causing urinary leakage.

Clinical presentation

A detailed history and physical examination is needed for the evaluation of SUI and to distinguish it from other forms of UI. The history should include screening questions for symptoms of SUI, UUI, frequency and nocturnal enuresis. Apart from the symptoms of UI, a history of lower urinary tract dysfunction should also be taken, including any voiding dysfunction such as hesitancy, poor stream and incomplete emptying, which may indicate overflow incontinence or recurrent urinary tract infections (UTIs). Symptoms such as urgency, dysuria and painful bladder should also be assessed to rule out other lower urinary tract disorders, such as inflammatory bladder conditions.

SUI may be accompanied by other gynaecological disorders, such as urogenital prolapse. History of recurrent urinary tract infections, acute urinary retention (AUR), menstrual problems, childhood enuresis and previous gynaecological surgeries should be taken. Obstetric history, including a history of big baby, pregnancy and delivery-related complications such as instrumentation, should be taken to assess the presence of risk factors. Neurological disorders such as multiple sclerosis and endocrine disorders like diabetes mellitus can also present as stress incontinence. Certain medications, including diuretics, tricyclic

FIGURE 1. MODIFIED OXFORD RATING SCALE

Grade 0	■ No discernible muscle contraction
Grade 1	■ A flicker or pulsation is felt under the examiner's finger
Grade 2	■ An increase in tension is detected, without any discernible lift
Grade 3	■ Muscle tension is further enhanced and characterised by lifting of the muscle belly and also elevation of the posterior vaginal wall. A grade 3 and stronger can be observed as an in-drawing of the perineum and anus
Grade 4	■ Increased tension and a good contraction are present which are capable of elevating the posterior vaginal wall against resistance (digital pressure applied to the posterior vaginal wall)
Grade 5	■ Strong resistance can be applied to the elevation of the posterior vaginal wall; the examining finger is squeezed and drawn into the vagina (like a hungry baby sucking a finger)

antidepressants and α -adrenergic blockers, can worsen urinary incontinence. Symptoms related to quality of life, low mood, reduced confidence and sexual dysfunction should be noted.⁷

Physical examination should include BMI and abdominal examination to rule out abdominal masses or signs of urinary retention. Vaginal examination should be performed to assess for pelvic organ prolapse and pelvic musculature tone and the presence of incontinence. Pelvic muscle tone is assessed by inserting one or two fingers into the lower third of the vagina and asking the patient to squeeze the examining fingers. The duration of the contraction should be noted and the strength of contraction could be rated using tools like the Modified Oxford Rating Scale (see Figure 1).⁸

A detailed neurological examination may be needed if an underlying neurological disorder is suspected. Anal tone, perineal sensation and bulbo-cavernous reflex will test the integrity of sacral nerve roots. Anal tone is assessed by asking the patient to squeeze the clinician's examining finger during rectal examination. Bulbo-cavernous reflex is elicited by lightly tapping the clitoris, which should produce reflex contraction of the external anal sphincter muscle. Pulmonary and cardiovascular assessment may be indicated to assess the control of cough or the need for medications such as diuretics.

Investigations

Urine dipstick and MSU should be taken to exclude a UTI. Patients should be asked to maintain a bladder diary for at least a 3-day period to record fluid intake, volume and frequency of micturition and incontinence episodes. Bladder diaries are a useful tool, not only to provide information on the nature and the severity of UI, but also to help in directing treatment. Further specialist urodynamic investigations are often needed, particularly before surgical interventions. Uroflowmetry is a simple test to measure urine flow rate. Bladder scan or post-void residual is usually carried out at the end of the procedure to determine the post-void urine, which can point towards voiding dysfunction. Cystometry is used to measure pressure-volume relationship of the bladder and helps diagnose urodynamic stress incontinence and detrusor overactivity.

Management

Management is based on the general health of the patient, severity of the condition and its impact on the

The annual incidence of SUI has been estimated to be between 4% and 10%⁴ peaking in women aged between 45 and 49 years

TABLE 1: INDICATIONS FOR REFERRAL (NICE Guideline-CG40, 2006)

Urgently refer women with any of the following to a urologist (National target of two weeks applies)

- Microscopic haematuria if aged 50 years and older
- Visible haematuria
- Recurrent or persisting UTI associated with haematuria if aged 40 years or older
- Suspected pelvic mass arising from the urinary tract

Refer women to a gynaecologist with:

- Symptomatic prolapse visible at or below the vaginal introitus
- Palpable bladder on bimanual or physical examination after voiding

Consider referring women with:

- Persisting bladder or urethral pain*
- Clinically benign pelvic masses*
- Associated faecal incontinence*
- Suspected neurological disease*
- Voiding difficulty*
- Suspected urogenital fistulae*
- Previous continence surgery
- Previous pelvic cancer surgery
- Previous pelvic radiation therapy

**In clinical practice, these patients will usually need referral to secondary services.*

patient's quality of life. Occasionally SUI may be the presenting complaint of a more sinister underlying pathology, such as bladder carcinomas. Urgent referral to the secondary care services must be made when a red flag symptom is present (see Table 1). Treatment modalities for SUI include behavioural and lifestyle modifications, medical and surgical treatments.

Conservative approaches

Absorbent products are useful in containing leakage, particularly in cases of light UI. While sanitary pads may be more economical, incontinence pads are superior in containing leakage and for overall acceptability.⁹ Regular hygiene and fragrance free wipes should be recommended to reduce irritation/excoriation of the vulva with constant urinary contact. Incontinence pads may be available through the NHS subject to eligibility criteria set out by the local clinical commissioning groups. This may warrant referral to local incontinence advisors or district nurses for the assessment of eligibility criteria.

Obesity is an independent risk factor for SUI. Weight loss of 5% or more has been associated with significant improvement in incontinence symptoms.^{10,11} Although more effective for urge or mixed incontinence, other lifestyle changes, such as modification of fluid intake, restricting consumption of carbonated drinks, and smoking cessation, may also help in alleviating SUI.

Pelvic floor muscle training

Pelvic floor muscle training (PMFT) is an effective, simply administered and risk free exercise that is supported by substantial evidence for its effectiveness. A recent Cochrane review concluded that women

Neurological disorders, such as multiple sclerosis, and endocrine disorders like diabetes mellitus can also present as stress incontinence

treated with PFMT are more likely to report cure or improvement, have better quality of life, experience fewer leakage episodes per day and have less urine leakage.¹² A trial of supervised PFMT of at least 3 months' duration should be offered as first-line treatment to women with stress or mixed UI. PFMT is usually delivered and supervised by specialist incontinence nurses or physiotherapists. Pelvic floor muscle training should also be offered to women in their first pregnancy as a preventive strategy for UI.¹³

PFMT may be further augmented with biofeedback or exercises using vaginal cones. Some patients with SUI may have difficulties in identifying and coordinating muscle groups involved in PFMT. Electromyographic monitoring of voluntary pelvic muscles while undertaking PFMT can increase patients' awareness of the pelvic floor muscles, thereby increasing the effectiveness of PFMT. Vaginal cones are weighted cone-shaped vaginal inserts of graduated weights. The patients are initially asked to insert the lightest cone and retain it using pelvic floor contraction. As their pelvic musculature becomes stronger, they are asked to progressively retain heavier cones, improving pelvic floor muscle tone.

Medical treatment

Oestrogen replacement therapy has a limited role in the management of SUI in premenopausal women; however, topical oestrogen may help in improving vaginal dryness and associated discomfort.

Duloxetine, a serotonin and noradrenaline reuptake inhibitor (SNRI), is the only medicine licensed for the treatment of SUI. Duloxetine increases the activity of the striated external urethral sphincter by modulating the serotonin and nor-adrenaline reuptake in the presynaptic neurons in onuf's nucleus in the sacral spinal cord. Duloxetine has been associated with a 50% or greater reduction in incontinence episodes in a number of randomised controlled trials.^{14,15} This may be particularly helpful as an interim measure in young, premenopausal women who have not yet completed their family. Duloxetine should not routinely be used as a second-line treatment for women with SUI, although it may be offered as second-line therapy if women prefer pharmacological to surgical treatment or are not suitable for surgery.¹³ The recommended dose is 40mg twice daily. There is lack of evidence for long-term safety of duloxetine; however, long-

term treatment may be needed if it is well-tolerated and other suitable treatments cannot be offered due to clinical reasons or patient preference. Combined PFMT and duloxetine treatment has been shown to be more effective than either of these given alone.¹⁶

Surgical treatment

If conservative measures are not successful, surgery remains the mainstay of treatment. Colposuspension (suspension of the bladder neck to the iliopectineal ligaments situated on the posterior aspect of the symphysis pubis, either through open abdominal or laparoscopic surgery) used to be considered the gold standard treatment. However with recent advances in surgical treatments, it has given way to the less invasive but equally effective procedures such as tension free tapes via transobturator (TOT) or retropubic (tension-free vaginal tape – TVT) approaches.

Long-term success rates for the TVT are reported to be extremely favourable. In a 17-year follow-up of TVT procedure, authors noted an objective cure rate of over 90% and subjective perception of either cure or significant improvement in over 87% of patients.¹⁷ In a comparative study between Burch colposuspension and TVT, the authors noted that there was no difference between the two groups in terms of cure rates. Operative time for TVT was significantly less, as was postoperative pain. Return to normal activity was also earlier in the TVT patients compared with the Burch colposuspension group.¹⁸ Vaginal tapes are the commonest treatments for SUI in the western world. Although these are generally day case procedures, poor voiding is a recognised complication, necessitating self catheterisation (usually for a limited period), mesh exposure and the development of overactive bladder. NICE guidelines recommend that TVT/TOT should be considered as the first line surgical treatment if PFMT has not been successful.¹³ While there may be no significant difference between outcomes following TVT or TOT, TOT has been reported to have a lower risk of postoperative complications.¹⁹

Other surgical interventions include peri-urethral injections of bulking agents – used mainly in frail elderly patients or where conventional surgery has failed. When bulking agents are used in the urethra, the goal is to improve the coaptation of the urethra (urethral seal effect) during the storage phase, and the maintenance of that coaptation during periods of increased abdominal pressure.²⁰ Intramural bulking agents improve coaptation by strengthening the urethral wall and increasing the forces needed for urethral closure. The procedure usually needs to be repeated as the effect wears off with time, but it has few complications. Rarely, artificial urethral sphincters, which consist of a fluid filled reservoir placed around the bladder neck with a battery operated pump in the labium majus, can also be implanted. However they have high complication rates and are only utilised when all conventional methods fail.

KEY POINTS

- 1 SUI is the most common cause of urinary incontinence in pre-menopausal women and has significant effect on the quality of life of the patients
- 2 Most women do not seek help
- 3 Bladder diary is an important investigatory tool for assessing severity of the condition
- 4 Urgent referral is needed if any red flag signs are present
- 5 Pelvic floor muscle training is the recommended first line treatment for SUI
- 6 Success rates for surgical treatment are high but it is usually considered only after women have completed their family

- 4 Reynolds W, Dmochowski R, Penson D. *Curr Urol Rep* 2011;12:370-6.
- 5 Danforth K, Townsend M, Lifford K, et al. *Am J Obstet Gynecol* 2006;194:339-45.
- 6 Persson J, Wolner-Hanssen P, Rydhstroem H. *Obstet Gynecol* 2000;96:440-5.
- 7 Daniel R, Mallen C, Cooper J. *BMJ* 2010;340:b5533.
- 8 Laycock J, Jerwood D. *Physiotherapy* 2001;87:631-642.
- 9 Fader M, Cottenden A, Getliffe K. *Cochrane Database Syst Rev*, 2007. CD001406.
- 10 Auwad W, Steggle P, Bombieri L, et al. *Int Urogynecol J Pelvic Floor Dysfunct* 2008;19:1251-9.
- 11 Subak L, Whitcomb E, Shen H, et al. *J Urol* 2005;174:190-5.
- 12 Dumoulin C, Hay-Smith J. *Cochrane Database Syst Rev*, 2010. CD005654.
- 13 NICE.Guideline-Cg40 2006. National Institute for Health and Clinical Excellence: Guidance Urinary Incontinence: The Management of Urinary Incontinence in Women. London.
- 14 Millard R, Moore K, Rencken R, et al. *BJU Int* 2004;93:311-8.
- 15 Van Kerrebroeck P, Abrams P, Lange R, et al. *BJOG* 2004;111:249-57.
- 16 Ghoniem G, Van Leeuwen J, Elser D, et al. *J Urol* 2005;173:1647-53.
- 17 Nilsson C, Palva K, Aarnio R, et al. *Int Urogynecol J* 2013;24:1265-9.
- 18 El-Barky E, El-Shazly A, El-Wahab O, et al. *Int Urol Nephrol* 2005;37:277-81.
- 19 Zugar V, Labanaris A, Rezaei-Jafari M, et al. TVT vs. TOT: *Int Urol Nephrol* 2010;42:915-20.
- 20 Kerr L. *Rev Urol*, 2005;7 Suppl 1:S3-S11.

References

- 1 Hannestad Y S, Rortveit G, Sandvik H, Hunskaar S. *J Clin Epidemiol* 2000;53:1150-7.
- 2 Ko Y, Lin S J, Salmon J W, Bron M S. *Am J Manag Care* 2005 11, S103-11.
- 3 Hannestad Y S, Rortveit G, Hunskaar S. *Scand J Prim Health Care* 2002;20:102-7.

BJFM



To find out what's new
in *The British Journal of
Family Medicine*, sign up
to our newsletter today
- go to www.bjfm.co.uk

Follow us on Twitter
 @BJfamilymed

www.bjfm.co.uk