

Female urinary incontinence: A review

Abdool Z, MBChB, MMed(O&G), FCOG(SA)
Consultant for the Department of Obstetrics and Gynaecology
University of Pretoria

Correspondence to: Dr Zeelha Abdool, E-mail: zeelha.abdool@up.ac.za

Abstract

Urinary incontinence affects approximately a quarter of a billion people worldwide. It is associated with high economic costs, psychological morbidity and adverse effects on the quality of life. Despite this, few women seek help for this condition either due to embarrassment and unwillingness to discuss the symptom with their family member or friend or, acceptance of the disorder as a natural part of aging or being unaware that treatment exists. More resources are utilised in maintaining patients with chronic incontinence rather than for diagnosis and treatment of the condition. Urinary incontinence is a complex problem resulting from many different causes and for which many different approaches to treatment exist. The commonest types of incontinence include stress urinary incontinence, urge urinary incontinence and mixed incontinence. Recently, better understanding of the pathophysiology of urinary incontinence has led to the development of numerous non-pharmacological, pharmacological and surgical interventions.

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Introduction

According to the World Health Organisation, urinary incontinence is "a widespread global disease and one of the last medical taboos for many people".² In South Africa, urinary incontinence and pelvic floor dysfunction are major health problems. Urinary incontinence affects all ages, both sexes, and all social classes. Its prevalence is underestimated and it is estimated that only one in four symptomatic women will seek help for this problem.³ The annual direct cost in all ages for incontinence is estimated to be over 16 billion US dollars (in 1995 dollars), which is more than that of breast, cervical, ovarian and uterine cancers combined.^{4,5}

In 2002, the Standardisation Subcommittee of the International Continence Society (ICS) changed the

original ICS definition of incontinence, from 'urinary incontinence is the involuntary loss of urine that is a social or hygienic problem,' since it relates the complaint to the quality of life, to 'urinary incontinence is the complaint of any involuntary loss of urine'.⁶ Standardisation thus facilitates comparison of results and effective communication between clinicians.

Types of Urinary Incontinence

There are three main types of urinary incontinence (UI), stress urinary incontinence, urge urinary incontinence and mixed urinary incontinence.

According to the ICS, the definitions are as follows:

- Stress UI is the complaint of involuntary leakage on effort or exertion, or on sneezing or coughing.

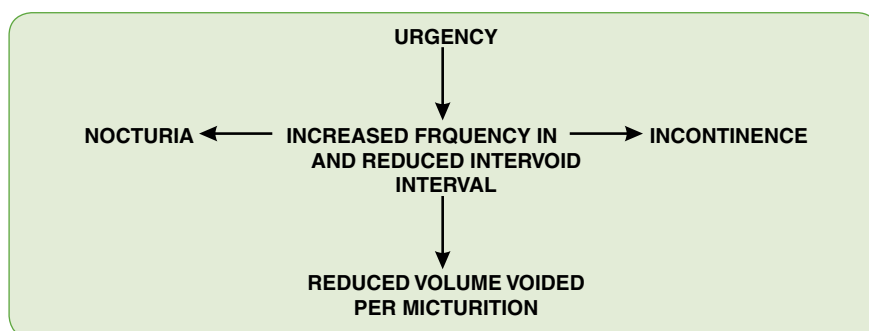
- Urge UI is the complaint of involuntary leakage accompanied by or immediately preceded by urgency (a sudden compelling desire to urinate that is difficult to defer).
- Mixed UI is the complaint of involuntary leakage associated with urgency and also with exertion, effort, sneezing or coughing.

Stress UI (SUI) is a very common condition affecting approximately half of incontinent women between 18 and 90 years of age. In stress UI there are two main mechanisms for urinary leakage:

- Insufficient urethral support from the endopelvic fascia and muscles. Periods of increased intra-abdominal pressure causes descent of the urethra-vesical junction. Increased urethral mobility forces urine from the bladder into the urethra
- Intrinsic sphincter deficiency (ISD) occurs when there is failure of the urethral sphincter due to mucosal and muscular atrophy and denervation, occurring alone or in combination with inadequate urethral support. It is commonly due to aging, neurologic disorders, obstetric/surgical trauma and lack of estrogen.

Urge incontinence, together with other symptoms such as urgency, frequency, and nocturia forms part of the overactive bladder (OAB) symptom syndrome. Urgency is the 'driving' symptom in OAB, with the patient experiencing urgency at

Figure 1: Urgency drives the other symptoms of the overactive bladder syndrome.



Adapted from Chapple, *et al*. The role of urinary urgency and its measurement in the overactive bladder symptom syndrome: current concepts and future prospects. *BJU Int* 2005; 95: 335-340.⁷

unpredictable and inconvenient times resulting in the loss of urine before the toilet can be reached.⁷ (See Figure 1). The overall prevalence of OAB is estimated to be 16.9% in the United States, the prevalence increasing with advancing age.⁸ Incontinence occurs in approximately one third of patients presenting clinically with OAB.

Recently a cross-sectional population based survey of 11521 individuals aged 40- 64 years, conducted in France, Germany, Italy, Spain, Sweden and the United Kingdom concluded that the OAB symptoms have a significant effect on the emotional well-being and productivity of the patient both at home and at work.⁹

Mixed urinary incontinence, a combination of both stress and urge incontinence, may result from compensatory responses initiated by the incontinent patient. Approximately 50% of patients with incontinence will have mixed urinary incontinence symptoms. The degree to which each component contributes to the patient's incontinence varies, but one symptom will be dominant either stress or urgency.

Initial Assessment

In the initial assessment, the patient's incontinence should be categorised, and treatment tailored toward the predominant symptom.

To achieve optimum success, good communication between the healthcare professional and patient is imperative. According to the National Institute of Clinical Excellence (NICE) Clinical Guideline, healthcare professionals should adopt a 'women-centered care' approach women should be provided with evidence based information and the treatment and care tailored to their individual needs and preferences.¹⁰

During examination a routine digital assessment of pelvic floor muscle contraction should be done, using the Oxford grading system. The grade, strength and duration of muscle contraction is assessed. The scale is as follows:

Table 1: Oxford Grading System

0	Nil
1	Flicker
2	Weak
3	Moderate
4	Good
5	Strong

The Q-tip test evaluates the mobility of the urethra and bladder neck. This is done by inserting a sterile, lubricated cotton-bud into the urethra to the level of the bladder neck. The patient is then asked to strain. The resting and straining angles are measured, and the difference between the two angles is calculated. A difference of greater than 30 degrees is thought to be indicative of hypermobile urethra. Note that this test does not establish the diagnosis of SUI and does not add any extra information to history and examination.^{11, 12}

The Bonney test is a test of bladder neck elevation and indicates the likelihood of curing stress incontinence with a vaginal repair. It is currently not recommended for testing urethral competence. To demonstrate SUI the patient should have a full bladder. Note that often women will empty their bladder prior to a gynaecologic examination.

After history and examination, a urine dipstick test should be done to exclude a urinary tract infection. Urine positive for leucocytes and nitrites should be sent for microscopy, culture and sensitivity. A post-void residual should be done either by a bladder scan or by catheterisation.

This should be followed by a 3 day bladder diary, incorporating both a working and a leisure day. Bladder diaries are a reliable method of quantifying urinary frequency and incontinence episodes.

Identify factors warranting urgent referral i.e.:

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

Categorise the urinary incontinence and discuss treatment options with patient, family or carer.

The use of multi-channel cystometry, ambulatory urodynamics or video-urodynamics is not recommended before starting conservative treatment. It is recommended in women before surgery for UI if:

- There is clinical suspicion of overactive bladder, or
- There has been previous surgery for stress incontinence or an anterior compartment prolapse, or
- There are symptoms suggestive of voiding dysfunction.

It has not been shown that carrying out urodynamic investigations before initial treatment improves outcome.

CONSERVATIVE TREATMENT

Lifestyle interventions:

This includes the following:

In patients with urge UI/ OAB:

- Reduction in caffeine consumption
- Fluid restriction to 2 - 2,5 liters per 24 hour
- Reduction of body mass index to ≤ 30

Physical therapy

In patients with mild SUI or mixed UI, a trial of supervised pelvic floor muscle training of at least three month's duration should be offered as first line treatment. Evidence suggests that pelvic muscle floor training continued for three months is safe and effective.

Pelvic floor muscle training should be offered to women in their first pregnancy as a preventative strategy for UI, since it reduces the likelihood of postnatal UI.

Therapy should comprise at least eight contractions three times day. Electrical stimulation and/or biofeedback should be considered when women do not actively contract their pelvic floor muscles, thereby promoting motivation.

In patients with urge or mixed UI, bladder training for a minimum of 6 weeks should be offered as first line treatment. Bladder training has fewer adverse effects and lower relapse rates than treatment with anti-muscarinic agents. The addition of an anti-muscarinic agent should be considered should one not achieve benefit from bladder training alone.

DRUG THERAPY

Although the mainstay of treatment for SUI is surgical treatment, new drug therapies are being sought worldwide. Attention has focused on alpha-agonists with a high specificity for urethral smooth muscle and selective serotonin norepinephrine reuptake inhibitors, specifically duloxetine.

Duloxetine inhibits the reuptake of serotonin and norepinephrine in the motor neurons of the pudendal nerve. This increases the amount of neurotransmitters in the sacral spinal cord (Onuf's nucleus), the end result being increased pudendal stimulation of the urethral striated sphincter muscle. It has been shown to significantly improve the incontinence episode frequency and quality of life in patients with SUI.¹³ Nau-

sea is the most common adverse effect which may result in discontinuation of treatment. Other side-effects include fatigue, dry mouth, insomnia, constipation, dizziness and somnolence. It is, however, not recommended as first-line treatment. It may be offered as second-line treatment when:

- Women prefer pharmacological treatment to surgical treatment
- Women not suitable for surgical treatment

Drug therapy is the mainstay of treatment for overactive bladder. Most of the drugs exert their effects by acting on the acetylcholine receptors within the detrusor muscle. These are not without side-effects and therefore therapy is seldom continued indefinitely. Among the list below, oxybutynin has a well documented efficacy and is becoming more widely available with new and novel delivery systems. Oxybutynin and tolterodine are currently the firstline treatment for patients with overactive bladder. Table 2 below compares the different drugs used in the treatment of overactive bladder.

SURGICAL TREATMENT

When conservative management has failed, a detailed discussion of benefits versus risks of surgical treatment is the first step.

Stress UI:

The retropubic mid-urethral tape (bottom-up approach), with a type 1 mesh (acroporous polypropylene with pore size > 50µm) is the procedure of choice due to the efficacy of long-term data.

Other options include open Burch colpo-suspension, retropubic (top-down approach), or the transobturator approach. Note that the transobturator approach is limited by the lack of long-term data.

The use of intramural bulking agents is limited by:

- need for repeat injections
- diminishing efficacy with time
- inferior to the retropubic sling

Anterior colporaphy, needle suspensions and para-vaginal defect repair are not recommended for the treatment of stress incontinence.

Surgery should be performed by surgeons with appropriate training. For maintaining competence it is suggested that an annual workload of at least 20 cases of each primary procedure for stress incontinence be performed.

Surgeons should audit their data and submit their outcomes to national registries.

Overactive bladder:

For urinary incontinence, due to detrusor over activity, not responding to conser-

vative treatment or drug therapy, sacral nerve stimulation may be offered.

Other options include augmentation cytoplast in patients willing and able to catheterise.

The use of botulinum toxin A in patients with idiopathic detrusor over activity is limited by the lack of long-term data. The above treatments may be available at selected specialised centers.

It is quality of life assessment

important to evaluate the efficacy of a particular therapy and compare symptom severity between patients by measuring the quality of life in women with pelvic floor disorders. This can be done using the short forms of the Pelvic Floor Distress Inventory-20 and Pelvic Floor Impact Questionnaire - 7.¹⁴ These are valid, reliable and useful in clinical practice. There are many other questionnaires available, both generic (which lack sensitivity) and disease specific e.g. Kings Health Questionnaire.


Conclusion

Urinary incontinence is an important public health issue. Epidemiological data for South Africa is lacking. This may be due to patient factors, lack of community continence centres, competing health needs, etc. Effective non-pharmacological, pharmacologi-


Table 2: Comparison of the different drugs used in the treatment of overactive bladder

DRUG	STRENGTHS	WEAKNESSES	COMMENTS
Generic oxybutynin	Cheap Well established Safe in pregnancy Dosing versatility	Side-effects	Most commonly prescribed drug Often not continued due to side-effects
Slow release oxybutynin	Has good efficacy M ₃ predominant	While side-effects are reduced and therefore more acceptable side-effects still limit use	Single day dosing easier for many patients
Oxybutynin patches	Avoids conventional side-effects while maintaining efficacy	Patch irritation in 15%	Offers new option -patient may prefer patches to tablets
Tolterodine	Available as bd or ER preparations Tends toward bladder specificity	Fewer side-effects than oxybutynin but not as effective	Developed from terodoline, but associated with torsades de pointes. Withdrawn in early 1990's
Tropium chloride	Quaternary ammonium compound Fewer CNS side-effects	Broad spectrum anticholinergic gives rise to side-effects	Long established in many countries Good safety profile
Solifenacin	M ₃ selectivity Variable dosing regimen STAR study - some advantages over detrusitol	Constipation in some patients	May change from second-line to first-line choice for many secondary care clinicians
Darifenacin	Most M ₃ selective medication	Side effects	Recently launched in RSA

Adapted from Textbook of female urology and urogynaecology. Staskin S, Cardozo L.2006

cal and surgical treatments exist. Only by fully understanding the impact of urinary incontinence on quality of life of women can we hope to improve its treatment. 

See CPD Questionnaire, page 43

 This article has been peer reviewed

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