

# Concepts in the Management of the Overactive Bladder in Women

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## SUMMARY

The 'overactive bladder' is a common problem affecting the elderly female population especially after the menopause. Urgency with or without urge incontinence accompanied by frequency of micturition and nocturia are presenting symptoms. The diagnosis is established after excluding other diseases of the lower urinary tract which have similar presenting features. The aetiology is multifactorial and this problem often causes physical, psychological and emotional distress to the patient. Management can be provided by primary care physicians initiating behavioral changes which include life style interventions and bladder drills with or without antimuscarinic drugs. The recalcitrant patient not responding to conventional therapy should be referred for specialist care. Non-conventional treatment using acupuncture, neuromodulation and surgical methods are only instituted in indicated cases.

## KEY WORDS:

*Overactive bladder, Urgency, Frequency, Non-pharmacological treatment, Antimuscarinics*

## INTRODUCTION

Overactive bladder (OB) is a common condition affecting the elderly population. It is defined by the International Continence Society as: "urgency with or without urge incontinence, usually with frequency and nocturia in the absence of pathological or metabolic causes that would explain these symptoms"<sup>1</sup>. The main presenting symptom is urgency and patients typically complain of a sudden but compelling desire to pass urine. When it cannot be suppressed, involuntary leakage occurs causing 'wet overactive bladder'. OB leads to both physical and psychological distress to the patient and has a negative impact on health related quality of life (QoL)<sup>22</sup>. Majority of patients have mixed symptoms of increased frequency and disturbed sleep pattern due to nocturia.

Due to low self esteem and embarrassment some patients suffer silently and delay treatment. Others may regard OB as part of the aging practice and decline medical assistance.

## Epidemiology

The worldwide prevalence of overactive bladder varies widely ranging from 6% to 20 %. It affects both males and females

with women having a higher incidence of urge incontinence (UI)<sup>3</sup>. In one study it was reported the incidence of overactive bladder associated with urge incontinence increases after the age of 44 years in women and 64 in men with a higher incidence of OB without UI in the latter<sup>3</sup>. The magnitude of this problem in Malaysia remains unknown but women referred to gynecology clinics by primary care physicians tend to be in the perimenopausal years.

## Pathogenesis

In a normal healthy person, the detrusors of the bladder wall remain quiescent as urine slowly accumulates to about 150-200 milliliters. At this stage, a healthy person is able to postpone the desire to pass urine though the detrusors sense the presence of urine (first sensation)<sup>4</sup>. However, when the volume exceeds 450-500 milliliters, the bladder contracts initiating an intense desire to micturate (maximum bladder capacity). In OB irritative symptoms occur before these thresholds are reached. The aetiology of this problem is multifactorial and complex<sup>4,5</sup>.

## Clinical evaluation of overactive bladder

Most patients with OB have urgency with or without urinary incontinence. Urinary frequency is common in view of 'detrusor instability'. The primary care physician should be able to make a diagnosis based on history and relevant predisposing and precipitating factors.

As the symptoms of OB can mimic other lower urinary tract disorders one should exclude common problems like cystitis, neuropathological disorders, and genitourinary malignancy and bladder stones as pathological entities. Among the risk factors that are associated with OB are stroke, spinal cord injury, diabetes mellitus, advanced age, obesity, multiparity and pelvic organ prolapse<sup>6,7</sup>. The painful bladder syndrome and interstitial cystitis are more difficult to diagnose at primary care level and warrant referral to a specialist. Medical disorders like diabetes, congestive heart failure, constipation and use of medications like diuretics and antidepressants should be recorded as part of routine history taking.

As some patients may have a mixed syndrome of UI with urodynamic urinary stress incontinence suitable clinical evaluations are warranted. A cough 'stress' test with a partially filled bladder would elicit the presence of demonstrable stress incontinence at pelvic examination.

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Basic urogynecologic- neurological tests like perineal and labial reflexes are easy to perform at the same sitting during pelvic examination. Micturition history is integral to diagnosis as a majority of the patients with overactive bladder do not have clear cut clinical signs.

Urine examination (urine analysis with dipstix and urine culture when indicated) is essential apart from eliciting a detailed history. Ultrasonography for residual post- void urine and imaging the bladder and kidneys contribute to excluding other causes for urinary symptoms.

The use of multichannel cystometry and ambulatory urodynamic tests (filling and voiding cystometry) are done in specialists centres. Only about 20 % of patients appear to require such sophisticated tests when conventional behavior therapy and a trial of antimuscarinics fail<sup>6,7,15</sup>.

Determining residual urine after voiding is especially indicated if the patient gives a history of voiding difficulty, a common reason for overflow incontinence of neurogenic bladder, which should remain a good differential. Recurrent lower urinary tract infection and a palpable bladder (urinary retention) after normal voiding should alert to this diagnosis. The use of cystoscopy is indicated in those who have haematuria and urinary tract infections not responding to appropriate treatment.

The effects on QoL need to be assessed in all women with OB. The National Institute of Clinical Excellence (NICE) in the UK recommends the use of validated questionnaires (for example the International Consultation on Incontinence Modular (ICIQ)) for UI where one can determine with objectivity, the frequency of incontinence episodes, volume leaked, the effect on QoL and type of incontinence.

#### **Psychological Complications of Overactive Bladder**

Without proper management, OB leads to physical, psychological and emotional distress for the patient. Feeling embarrassed, guilt feelings and experiencing low self esteem are common reasons for delay in treatment. Some patients who have OB and UI may find difficulty in accessing public toilets in times of need and therefore avoid social activity. Anxiety and depression are found to be positively associated with OB<sup>16,17</sup>. Increased alcohol consumption also has been associated with overactive bladder<sup>17</sup>. Poor sleep is another common problem associated with nocturia and urgency.

#### **Management**

A well planned comprehensive and holistic approach is necessary in order to achieve the best treatment outcome for the patient with OB. Conservative measures include life style interventions and weight loss if the BMI exceeds 30 Kg/m<sup>2</sup>, especially if there is mixed UI. Avoiding bladder irritants like caffeine and spicy food together with reduction of fluid intake to 1000-1500 milliliters are recommended as initial treatment strategies<sup>4,18</sup>.

The NICE guidelines recommend bladder training for six weeks as first line treatment for UI and mixed UI (UI + Stress incontinence) apart from life style interventions<sup>19</sup>.

Patient counseling, rehabilitation and healthy life style play major roles in optimizing QoL.

#### **Common Pharmacological Agents**

##### *Antimuscarinics*

The antimuscarinics (anticholinergic) remain the mainstay of pharmacotherapy. Anticholinergic drugs (for example: Tolteradine, Oxybutynin, Darifenacin, Solifenacin Fesoterodine, Trospium) are commonly prescribed as first line therapy<sup>17</sup>. As medication is usually long term patients need adequate counseling especially that related to side effects of drugs.

Antimuscarinics reduce the amplitude of bladder contractions improving bladder capacity and voluntary contractions. Side effects of drugs are commonly related to action at the muscarinic receptors in the bladder. These include mental confusion, dry mouth, and constipation, prolongation of QT interval, papillary dilatation and difficulties in lens accommodation. The antimuscarinic drugs should not be prescribed to those with narrow angle glaucoma and myasthenia gravis. In the older population when higher doses of the drug are administered, ganglion blockade can occur resulting in muscle weakness and postural hypotension. Because of the non-selective action of antimuscarinics, it is important for primary care physicians to enquire about such effects. These side effects are part of the factors leading to falls in the elderly, contributing to morbidity due to bone fractures<sup>20</sup>.

In elderly postmenopausal women the use of local estrogen is associated with overall improvement in symptoms of frequency, urgency and nocturia<sup>21</sup>.

#### **Non pharmacotherapy**

The treatment of the overactive bladder can be frustrating to both patient and doctor as cure is near impossible and require long term medication.. Any form of treatment that does not require drugs or that can be used to complement conventional medication are often welcome. Combination of pharmacotherapy with behavioral modification proves to be more efficacious than either modality used alone<sup>22</sup>. Among the common non pharmacotherapy approaches are:

##### **Healthy lifestyle**

Invariably one needs to make some lifestyle changes. Reducing body weight is part of the management strategy in obese patient, because it is a known risk for overactive bladder. Stopping cigarette smoking and doing regular exercise should be encouraged.

##### **Bladder drills**

Bladder drills is a form of behavioral therapy. The aim is to provide adequate instructions in deliberate attempts to postpone the urge to micturate (voiding) for increasing intervals over a period of time.. This requires commitment and cooperation. Any successful delay, say for 10-15 minutes at each attempt puts the patient on the right path. These intervals are increased to half and then one hour. Repeating the process over days makes it possible to make the 'mind work over matter' and lessen the frequency of wetting the underclothes due to urge incontinence.

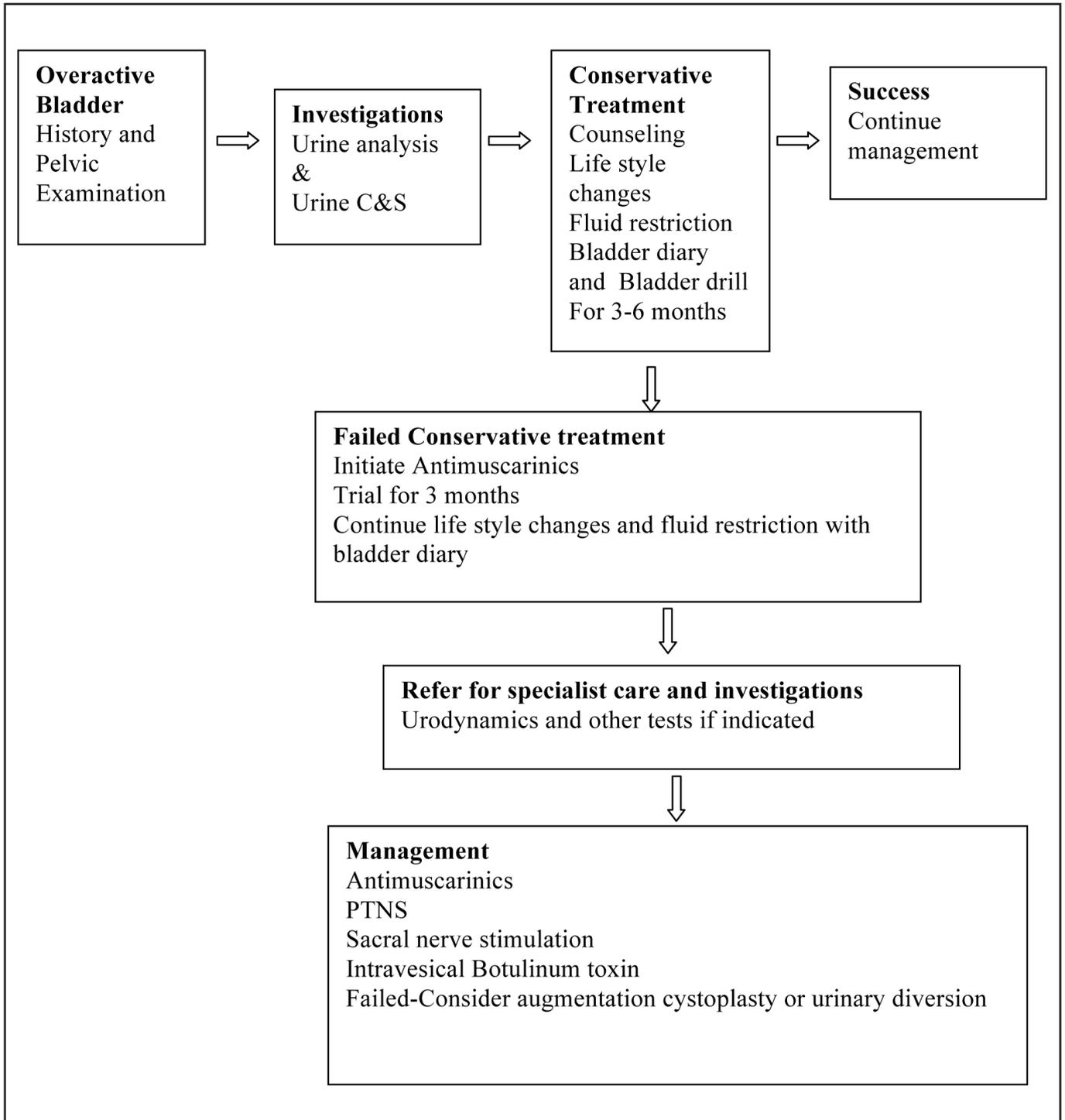


Fig. 1: Algorithm in the management of overactive bladder in women

Bladder drills work better by an organized attention to the types and volume of fluids (drinks) one consumes in a day. Reducing the total amount of drinks to 1.0-1.5 liters per day is good advice. Drinks containing caffeine and alcohol are best avoided, because these substances can cause diuresis. Not consuming fluids at night after, say 9 pm may avoid having to get up at night to pass urine.

Pelvic floor exercises are inexpensive and are done at home after some focused learning under the instructions of a physiotherapist. Sustaining these exercises for periods of 10 minutes several times of the day has contributed to success to bladder drills especially in those with mixed UI. Attention to diet and use of laxatives in those who are constipated is indicated. Success rates of over 60 % have been reported with bladder re-training and life style changes<sup>23</sup>.

#### **Bladder diary**

A 'bladder diary' is an objective tool in empowering the patient to take part actively in managing OB. The bladder diary permits the patient to record important information and events like time of each urination or incontinent episode and types of fluid consumed. A scoring system that is conventionally employed could be determined. The bladder diary is useful for both patient and physician so as keep track of the response to treatment and determine changes in voiding pattern.

#### **Electrical neuromodulation**

High rates of discontinuation of antimuscarinic drugs, the difficulty in adopting conservative measures like diet modification, life style changes and bladder re-training and the high complications with surgical methods employed for OB necessitates the need for alternative methods. One of the therapeutic interventions is neuromodulation. The introduction of neuromodulation for treating the OB is based on restoration of imbalances in the facilitatory-inhibitory control systems of the detrusor muscle. Neuromodulation could be directed to peripheral nerves like the posterior tibial nerve, pudendal nerve or the sacral nerve<sup>24</sup>.

#### *Sacral Nerve Stimulation*

The basis for sacral nerve stimulation lies in the modulation of hyperexcitable detrusors through induction of the somatic afferent inhibition of sensory processing in the spinal cord. The stimulation of the sacral nerve also has an added effect in its action on the pudendal nerve as voiding is inhibited by direct action on the reflex pathways coordinated by the pudendal nerve<sup>29</sup>.

Electrodes are implanted on one or both sides into the sacral nerves at S3/4. The electrodes are then connected to implantable impulse generators and continuous frequency stimulation is given. It is common to go through a trial period of about a week where percutaneous stimulation is done before implantation of electrodes permanently to determine successful reduction of OB symptoms to about 50%.

Permanent implants are retained for up to five years when a change of battery is required. Removal of the device would be warranted in the event there is migration of the electrodes. Efficacy of sacral nerve stimulation was shown by a

randomized trial involving 22 centres (N=125, women; N=30, men) in 1992 where patients with refractory UI were included. Forty seven per cent were completely dry at the end of six months compared to none in the control group with 76 % reporting clinical benefit ( either no benefit or reduction of at least half in leakage episodes). QoL improvement scores compared with other studies<sup>30,31,32</sup>.

The stimulation of sacral nerves through electrode implantation has also been effective in the treatment of other disorders like pelvic pain and urinary retention. Safety of sacral nerve stimulation electrode implantation has been investigated after reviewing 633 patients who had undergone 914 test stimulation procedures; 250 having had the neuromodulation system implanted. No permanent injury was seen at the end of a year. Improvement in techniques and equipment has made it possible for minimal invasiveness and electrode placement in the buttocks.

Although sacral nerve stimulation appears to be a safe procedure for OB and its efficacy is now clear, it remains an expensive tool that would impact on health costs<sup>33,34,35</sup>.

#### **Injecting Botulinum toxin**

The Botulinum toxin (Botox) is a neurotoxin which has become a popular means of treating the skin effects seen with aging and many patients appear to seek such treatment for cosmetic purpose. Using the same principles, the toxin has been seen to inhibit the overpowering effects of the detrusor muscles in making the bladder irritable. It inhibits the release of acetylcholine including adenosine triphosphate and neuropeptides. Currently it is only recommended for use in research settings.

As the treatment is a new modality and not without failures, patients need to be told of the possible problems like urinary retention after the injection. Reported incidence of urinary retention requiring self catheterization ranges from 4-45%<sup>36,37</sup>. Pain over the injections site is another common problem with or without haematuria, as the botulinum toxin is directly injected into the bladder muscle through a cystoscope with an operating channel. Other minor side effects are rashes, 'flu like' symptoms, myalgia and lethargy.

Although favourable results are reported in the intravesical injections of botulinum toxin, it is prudent not to resort to this form of treatment unless the patient is refractory to conventional medication and the overactive bladder symptoms have prevailed for over a minimum of six months.

#### **Role of surgery**

There are a few surgical procedures available for treating overactive bladder in patients where conventional and minimally invasive treatment have failed and QoL is severely impaired. Patient selection including those who are fit for the procedure and are well motivated are mandatory requirements for invasive surgical procedures.

Two procedures are surgical augmentation of the bladder and urinary diversion. Augmentation cystoplasty is performed by implanting a portion of the small intestine onto the urinary bladder so as to increase the capacity of the bladder.

Complication includes bladder rupture and other surgical complications like intestinal obstruction and failure to establish a leak-free anastomosis<sup>38,39</sup>. Another method is to completely divert the ureters (urinary diversion) into a segment of the small intestine (ileum) maintaining its vascular supply leading the ileum to a new stoma in the skin of the abdominal wall (ileal conduit). Fluid and electrolyte imbalance can occur and close monitoring of the patient is required. Total cystectomy may be offered in indicated cases. Surgical treatment is not commonly performed unless the patient fails all the conventional methods of treatment. Much thought needs to be given to using surgical treatment for the overactive bladder and a combined discussion with patient and surgeon in weighing the benefits of surgery over its risks would be appropriate.

### CONCLUSION

The overactive bladder is a common age related dysfunction of the bladder wall and reduced bladder capacity combined with hyper-excitability of detrusor muscles cause urgency and UI. Non pharmacological therapy involving behavioral therapy, bladder drills, counseling and healthy lifestyle help reduce symptoms and should be the mainstay of treatment. Antimuscarinic medications are useful in a majority of patients in improving their quality of life but treatment is long term. No drug is definitely superior to another and cost-effectiveness, compliance and side effects are important factors to be considered. Acupuncture and invasive surgical procedures are rarely needed in a majority of cases. The multitude of treatment options available is testament to the need for careful evaluation and adopting a conservative and step wise approach as outlined appears sensible.

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## Concepts in the management of the overactive bladder in women

### (True/False)

1. **The following are recognized risk factors for overactive bladder.**
  - A. Brain injury
  - B. Diabetes mellitus
  - C. Obesity
  - D. Advancing age
  - E. Multiparity
  
2. **Which of the following are presenting features of overactive bladder?**
  - A. Urgency
  - B. Nocturia
  - C. Hematuria
  - D. Suprapubic pain
  - E. Frequency
  
3. **Recognised psychosocial complications of overactive bladder are:**
  - A. Depression
  - B. Low self esteem
  - C. Social isolation
  - D. Guilt feelings
  - E. Embarrassment
  
4. **The following statements are true regarding treatment of overactive bladder:**
  - A. Anticholinergic is the first line of therapy.
  - B. Surgery should be performed without delay in patient who has urge incontinence.
  - C. Botulinum toxin injection is associated with urinary retention.
  - D. Bladder drills method helps patient to control the frequency of passing urine.
  - E. Electroneuromodulation therapy is superior to anticholinergic drug treatment.
  
5. **The overactive bladder may be associated with the following conditions:**
  - A. Cystitis
  - B. Pelvic organ prolapse
  - C. Benign prostatic hypertrophy
  - D. Bladder calculi
  - E. Menopause