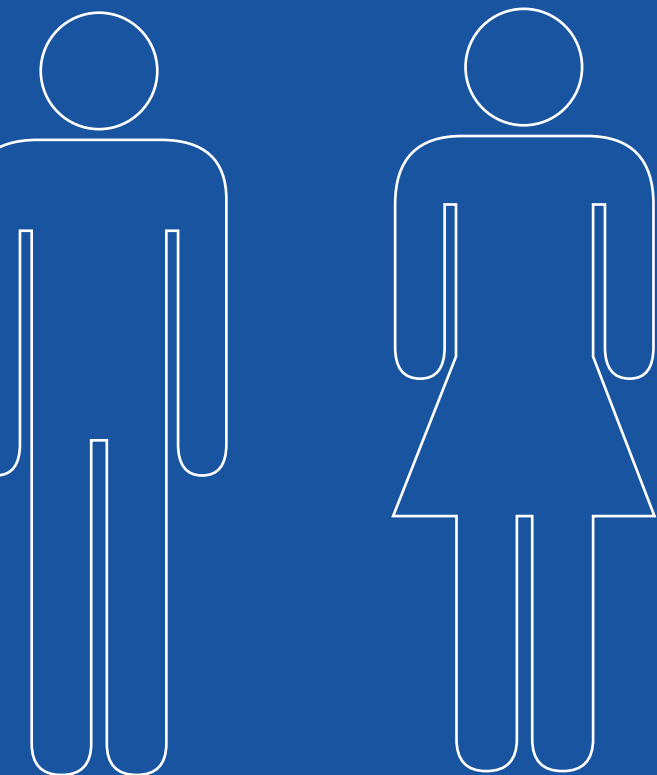


Overactive bladder Syndrome



Elderly care

Orthopaedic medicine

Stroke and rehabilitation

Gynaecology

Surgical recovery

Neurology

Overactive bladder

Paediatric medicine

Integrated Continence

Overactive Bladder Syndrome (OAB)

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In 2002, the standardisation subcommittee of the International Continence Society (ICS) defined overactive bladder syndrome (OAB) as urgency (U), with or without urge urinary incontinence (UUI), usually with frequency (F) and nocturia (N), if there is no proven infection or other obvious urethro-vesical pathology e.g. bladder tumour¹.

OAB is a symptom syndrome suggestive of detrusor overactivity (DO). Synonyms include urgency syndrome and urgency-frequency syndrome. DO may be idiopathic, if there is no defined cause, or neurogenic, if there is a relevant neurological condition, e.g. multiple sclerosis, spinal cord lesion etc. DO replaces the older term of detrusor instability (DI). The above terms are defined below.

Definition of terms:

- **Urgency** - Complaint of a sudden compelling desire to pass urine which is difficult to defer.
- **Urge Urinary Incontinence** - Complaint of involuntary leakage accompanied by or immediately preceded by urgency.
- **Daytime Frequency** - Complaint by the patient who considers that he/she voids too often by day.
- **Nocturia** - Complaint that the individual has to wake up at night one or more times to void.
- **Detrusor Overactivity** - Urodynamically demonstrable involuntary detrusor contractions, during the filling phase of cystometry, which may be spontaneous or provoked.

Prevalence & cost

12-22% of the population in Europe over the age of 40 (over 49 million people) and 16.5% in the USA (about 34 million people) suffer with OAB^{2,3}. Only about 60% of patients seek help and 27% receive treatment. OAB affects all aspects of quality of life (QoL) and causes a significant impact on society. In 2000, the direct costs alone, in the USA, were about US \$12.6 billion⁴.

Other burdens include indirect and intangible costs e.g. lost wages, decrease in QoL etc. These are difficult to measure and thus the overall cost is likely to be higher than the figure mentioned above. Patients with OAB also have increased risk of falls and fractures⁵.

Theories of OAB

Normally the bladder should be relaxed when being filled with urine. In DO, there are involuntary detrusor contractions, the cause of which is unknown. Three theories have been proposed, however the reality is probably a spectrum encompassing one or more of them: Myogenic⁶ (muscle related) theory suggests that partial denervation of the detrusor results in alterations in the properties of the detrusor muscle cells leading to increased excitability thus producing involuntary pressure rises.

Neurogenic⁷ (nerve related) theory suggests that damage to central inhibitory pathways or sensitisation of peripheral afferent terminals in the bladder can unmask primitive voiding reflexes that trigger DO. Autonomous bladder⁸ theory suggests that DO is a consequence of inappropriate activation or modulation of phasic activity.

- Medical History
- Physical Examination
- Investigations
- Treatment
- Referral

Medical history

Urological history

Bowel function history, for example irritable bowel syndrome.

Past medical/surgical history such as cardiac failure or major abdominal surgery causing denervation.

Gynaecological/Obstetric history in women, the number and mode of delivery of children, relationship of incontinence to intercourse and other activities of daily living.

In men, enquiry about erectile dysfunction is important for example in neurogenic DO.

Drug history such as diuretics or alpha-blockers.

The amount and type of fluid intake, as caffeine⁹ and alcohol can exacerbate symptoms

Urological History

Enquire about 'storage' lower urinary tract symptoms (LUTS):

Urgency

Frequency

Nocturia

Urge urinary incontinence

Stress urinary incontinence

Ask the patient 'Which is your most bothersome symptom?'

Need to exclude 'voiding' LUTS:

Haematuria

Hesitancy

Slow stream

Interrupted stream

Physical Examination

Abdomen

External genitalia

Digital rectal examination (DRE) – check for anal reflex, tone, sensation and pelvic squeeze. Feel the prostate in men.

Per vaginal (PV) examination in women – look for atrophic vaginitis, leakage during coughing/straining, assess voluntary pelvic floor muscle contraction and check for pelvic organ prolapse using a Sim's speculum with the patient lying in the left lateral position, and asking the patient

to bear down (strain).

Neurological examination of the lower limb and perineum, including reflexes.

Investigations

Height and weight (important in stress incontinence).

Urinalysis – ‘dipstick’ the urine to exclude infection (leucocytes & nitrites), haematuria (blood) and glucosuria (glucose).

Measure post-void residual (PVR) using a bladder scan e.g. BVI 3000 or BVI6100. If not available then use ‘in/out’ catheterisation but this is invasive and may be uncomfortable.

Ask the patient to complete a voiding diary and a quality of life questionnaire⁹ e.g. ICIQ-UI; ICIQ-OAB.



Voiding Diaries

There are 3 types of diaries1:

Micturition time chart: records only the times of micturitions for at least 24 hours.

Frequency/volume chart (FVC): records the voided volume and the time of each micturition, day and night, for at least 24 hours.

Bladder diary: records the time of micturitions, voided volume and additional information such as, incontinence episodes, pad usage, urgency episodes, and fluid intake.

The duration that a diary is kept depends on how much information is required without compromising its diagnostic and management value. 7 days is the maximum (3 days being the minimum number required in men¹⁰ and 4 days in women¹¹).

Treatment

Since the cause of OAB is unknown, there is no curative treatment in almost all OAB patients and thus treatment is aimed at alleviating symptoms.

The principles of treatment are to increase voided volume, decrease urgency and reduce urge urinary incontinence episodes. There are five treatment

Modalities:

Lifestyle interventions

Bladder training (BT) and pelvic floor muscle exercises (PFME)

Pharmacotherapy

Neuromodulation

Surgery

Lifestyle Interventions

These include patient education about the condition, reducing alcohol and caffeine intake for example by switching to decaffeinated tea and coffee. Both alcohol and caffeine can act as mild diuretics and can exacerbate symptoms¹². Other measures include stopping fluid intake after 6pm and emptying the bladder before going to bed at night and before going out.

Bladder training and pelvic floor exercises

BT¹³ helps regain bladder control by suppressing involuntary detrusor contractions through feedback inhibition, thereby increasing the voided volumes and the time interval between voids. Combining BT with PFME (Kegel exercises) offers a simple, cheap and effective treatment that does not involve taking any medication.

There are many educational resources available and most urology departments produce leaflets explaining how to perform these exercises. Alternatively they can be obtained from Continence Advisors. The internet is also a useful tool and many websites explain how to perform these exercises e.g. www.continence-foundation.org.uk.

Pharmacotherapy

The detrusor muscle is supplied by the parasympathetic nerves (S2, 3 and 4). Acetylcholine (Ach) is the main neurotransmitter in the bladder smooth muscle and thus anticholinergics are the mainstay of medical treatment in OAB, acting on muscarinic receptors and blocking the effect of Ach¹⁴. However, anticholinergics lack selectivity for the bladder smooth muscle and thus have many side effects throughout the body such as dry mouth, blurred vision and constipation.

The main anticholinergics that are available are listed in Table 1 below. The availability depends on the local hospital formulary and national country guidelines. Choice of one drug over the other depends on cost, availability and patient tolerability.

Table 1: Drugs used for treatment of OAB

Generic Name	Trade Name	Available Doses	Mode of Delivery
Oxybutynin Chloride	Cystrin; Ditropan	IR: 2.5mg; 3mg; 5mg	Oral
	Lyrinel XL	ER: 5mg, 10mg, 5mg	Oral
	Oxytrol	36mg/patch (3.9mg/d)	Transdermal
Tolterodine Tartrate	Detrusitol; Detrol LA	IR: 1mg or 2mg	Oral
	Detrusitol XL	ER: 2mg, 4mg	Oral
Trospium Chloride	Regurin; Sanctura	20mg	Oral
Propiverine Hydrochloride	Detrunorm	15mg	Oral
Solifenacin Succinate	Vesicare	15mg or 10mg	Oral

IR – Immediate Release ER – Extended Release MG – milligram

The new antimuscarinics that will be available on the market within the next 2 years are Darifenacin and Fesoterodine. Other treatments include Botulinum A-toxin (Botox) injections into the bladder submucosa and intravesical resiniferatoxin, an analogue of capcaisin. These have been mainly used in neurogenic DO.

Neuromodulation

Sacral nerve stimulation¹⁵ (SNS) such as Interstim, and possibly percutaneous tibial nerve stimulation¹⁶ (PTNS) for example Urgent PC, are new modalities that have been used in some centres world-wide and will probably help bridge the gap between pharmacotherapy and major surgery.

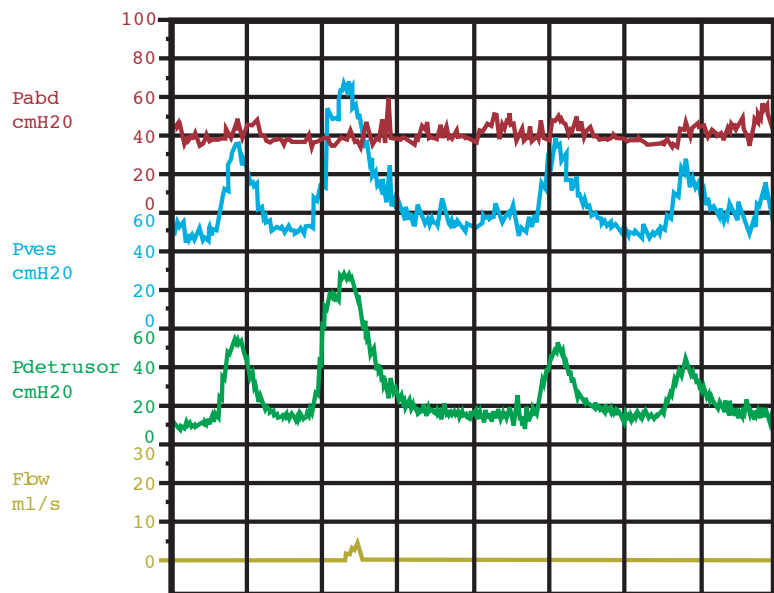
SNS is minimally invasive. It involves inserting a lead through the third sacral foramina to lie close to the third sacral nerve (S3) under local anaesthesia, and implanting a neurostimulator in the buttock if an initial trial period of stimulation is successful. This sends electric impulses to the sacral nerves and helps control OAB symptoms. PTNS is less invasive than SNS and has been approved by the FDA and European authorities. It involves inserting a needle electrode proximal to the medial malleolus. This modulates the sacral nerve plexus via the peripheral nervous system by stimulating the afferent nerve fibres of the tibial nerve and thus controls symptoms of OAB. The treatment is done in 30-minute sessions for 12 sessions and then repeated as required.

Surgery

If all treatments fail then surgery is the last resort¹⁷. This can be in the form of augmentation cystoplasty (increases functional bladder capacity), detrusor myectomy (removes the bladder smooth muscle and thus the nerves) or cystectomy and urinary diversion (removes the bladder completely). The main aim of all the surgical options is to abolish urgency and urge urinary incontinence.

OAB can normally be treated in the community by primary care physicians. If however conservative and medical treatment fail then patients should be referred to a urologist for a specialist opinion. Urodynamics is then performed to confirm the diagnosis of DO (Fig.1) and specialist treatment such as neuromodulation or surgery may be considered if the symptoms are bothersome.

Figure 1: Detrusor overactivity and urge urinary incontinence during the filling phase of urodynamics

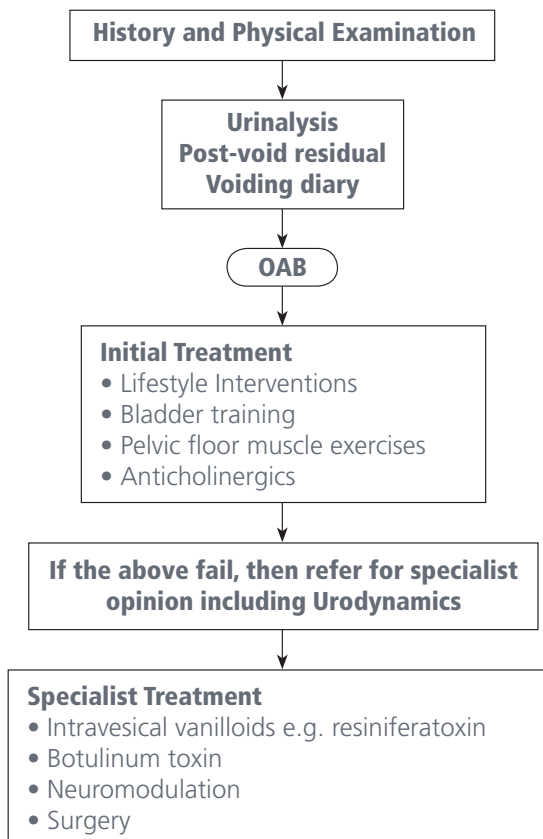


OAB is a prevalent condition that has a significant impact on an individual's QoL with a considerable financial burden to society. The exact cause of OAB is unknown and thus treatment, in the form of lifestyle interventions, bladder training, pelvic floor muscle exercises and anticholinergics, is mainly aimed at alleviating symptoms. Research into

Conclusion

the treatment of OAB continues with newer pharmacological treatments being launched in the near future. Most patients with OAB can be treated in the community although some resistant cases need urodynamics and specialist opinion to confirm the diagnosis and offer alternative treatments. Other modalities and interventions, such as neuromodulation, are being introduced to bridge the gap between medical treatment and surgical intervention.

Treatment algorithm for OAB



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