What is Overactive Bladder?

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INTRODUCTION

According to the report from the standardisation sub-committee of the International Continence Society (ICS), "overactive bladder" (OAB) is characterized by urgency, with or without urge incontinence, and is usually with frequency and nocturia [1]. The symptoms must be exhibited in the absence of pathological or metabolic disorders such as urinary tract infection, bladder cancer or benign prostatic enlargement which might otherwise cause such symptoms [2]. The above symptoms can also be described as "urge syndrome" or "urgency-frequency syndrome" [1]. Moreover, the ICS defines the full range of lower urinary tract symptoms (LUTS) [1]. **Urgency** *is the complaint of a sudden compelling desire to pass urine, which is difficult to defer*. **Urge incontinence** is defined as *involuntary urine leakage accompanied by or immediately preceded by urgency*. **Urinary frequency** is *the complaint by the patient who considers that he/she voids too often by day*. **Nocturia** means that *the individual has to wake at night one or more times to void*. Lower urinary tract symptoms are primarily defined from the patient's perspective because the same symptoms might be acceptable to one individual and intolerable to another. For example, "urinating six times during working hours" would be bothersome for a long-distance truck driver, but would be refreshing breaks to a bank manager. Therefore when evaluating a patient with OAB symptoms, we should endeavor to know the impact of their symptoms on the patient's quality of life.

WHAT IS OAB AND WHAT IS NOT OAB?

The definition of OAB seems to be concise and precise. However, much controversy had been generated since the term was introduced in 1999. For patients with monosymptomatic urinary frequency or monosymptomatic nocturia, is it possible to make a diagnosis of OAB? As the core symptom of OAB is urgency, those patients without urgency can not be categorized as having OAB. In 2001, Milson et al reported that the prevalence of OAB in Europe is 16.6% [3]. However, in that study frequency alone or nocturia alone was qualified as OAB. Abrams suggested that these patients should be excluded from the OAB group and stated that the true prevalence of OAB should be closer to the prevalence of urgency (9.2%) [4]. Therefore patients who drink large volume of water, which will cause polyuria and urinary frequency, should not be diagnosed as OAB. Similarly patients with congestive heart failure and lower limbs edema, will have nocturnal polyuria because of increased venous return in supine position and thus do not have OAB.

How about patients with urgency only? Monosymptomatic urgency is unusual, but it is known to occur. Abrams describes an example [4] where patients with OAB may learn that rapid bladder filling will aggravate urgency. Therefore they restrict their fluid intake to avoid these embarrassing symptoms. The key to evaluate such patients is a frequency-volume chart, or bladder diary. The diary may show a voiding frequency of seven times during daytime and nocturia once per night, with a daily urine output of 800 mL and an average voiding volume of around 100 mL. When these patients were asked to drink adequate fluid, urinary frequency and nocturia will occur, as the OAB definition illustrates.

The greatest controversy comes from the relationship between overactive bladder (OAB) and benign prostatic enlargement (BPE). As we know, BPE is a common diagnosis among male patients more than 50-year-old. Can we make the diagnosis of OAB if a BPE patient has urinary urgency and frequency? According to the international prostatic symptom score, BPE symptoms can be categorized as obstructive symptoms and irritative symptoms [5]. The irritative symptoms include frequency, urgency and nocturia. Therefore, the irritative BPE symptoms are almost the same as OAB symptoms. If we categorize all those BPE patients as having OAB, the prevalence of OAB among aging men will be as high as 50%. However, there do exist BPE patients who, having received medical therapy or even prostatectomy surgery, still persist in having urgency and frequency. In such cases, the irritative symptoms are due to an etiology other than BPE and we can diagnose such patients as having both BPE and OAB. Figure 1 illustrates the overlap of OAB and BPE symptoms [6]. As the definition of OAB says, the patient should not have a pathological or metabolic disorder that causes urgency and frequency. Thus benign prostatic enlargement, which is definitely a possible underlying pathology of urgency and frequency, should be excluded before we make a diagnosis of OAB.

Similarly, there is overlap between female stress urinary incontinence and OAB symptoms. For a female patient with mixed urinary incontinence (both urge incontinence and stress incontinence), urge incontinence might be due to bladder neck incompetence, which can be resolved by anti-incontinence surgery. In this case the underlying pathology of urgency and frequency is bladder neck incompetence. Therefore OAB should not be diagnosed simply because of her urgency and urge incontinence and anticholinergics should not be administered. However, urgency and frequency might persist after the anti-incontinence surgery. In this situation we can confidently make a diagnosis of both stress incontinence and OAB.

WHY WE NEED THE TERM "OAB"?

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Abrams stated that it's far easier to communicate with patients and physicians of different subspecialties by using "OAB" rather than "unstable bladder" or "detrusor hyperreflexia" [4]. Furthermore in primary care settings, most patients with symptoms suggestive of an overactive detrusor (urgency, urge incontinence, frequency and nocturia) can be treated once OAB is diagnosed. It means that OAB is an easily comprehended diagnosis, does not require a sophisticated examination and allows empirical therapy to be started.

The contribution of "OAB" is best illustrated by Prof. Yat-Ching Tong. In a Letter to the Editors entitled "OAB - The Apocalypse" [7], Prof. Tong used a fictitious story as follows: *There was a time when people in the world were living in grief. Many men and women, approximately 17% of the adult population, suffered from a mysterious urinary problem. They sought help from doctors. They were given various tests, including embarrassing and painful ones. In return, they received different diagnoses, with terms incomprehensible and unheard of. On the other hand, some doctors told them that there was nothing wrong with their urinary tract. Nothing! The men and women were furious. They charged the health providers with incompetence. Nothing was wrong ... No prescriptions! The pharmaceutical companies were disappointed. Then the dawn comes. Three wise men proclaim that all who suffer from the problem are actually afflicted with a disease called OAB. The beleaguered are redeemed and thankful. Gone with the tests; all the smart doctors can now point to the exact diagnosis. They are given the right to treat by the "authority". The pharmaceutical companies are happy. Even the health insurance companies are smiling, after calculating the profits saved from eliminating all those unnecessary clinical visits and examinations. The world is a better place.*

EVALUATION OF PATIENTS WITH OAB SYMPTOMS

The initial evaluation should include history taking, physical examination, urinalysis and a bladder diary. During the initial work-up, any underlying pathology that might cause the symptoms should be ruled out. Madersbacher pointed out that the second part of OAB definition, that is, *in the absence of local pathological or metabolic factors*, is often ignored [8]. Moreover, most GPs are unable to detect "local pathological or metabolic factors". The most common underlying pathologies are: neuropathic bladder, prostatic obstruction in men, urethral obstruction from pelvic organ prolapse in women and prior surgery in women [2]. Table 1 provides the complete list of etiologies.

The history taking should focus on the duration and severity of the OAB symptoms. It will help to differentiate acute illnesses (eg urinary tract infection, urolithiasis) from chronic diseases (eg BPE, stroke) that may cause the symptoms. The patient should be queried about any past history that may cause a neuropathic bladder, including diabetes, pelvic surgery history (eg radical hysterectomy, radical proctectomy), and neurological disease (eg stroke, Parkinsonism, lumbar spondylosis). Furthermore we should evaluate both voiding and storage symptoms, because voiding dysfunction may cause storage symptoms. For example, a woman with a bladder capacity of 300 mL may urinate 100 mL each time and have a post-voiding residual urine of 200 mL. In this situation her functional bladder capacity is only 100 mL, which will cause her urgency and frequency. Therefore we should treat her voiding dysfunction first instead of giving an antimuscarinic agent.

The physical examination should focus on excluding suspect etiologies based on the history taking. Flank knocking pain should be checked in cases where there is suspicion of urolithiasis. A vaginal examination should be performed on female patients with possibly pelvic organ prolapse (eg menopausal women, multiparous women

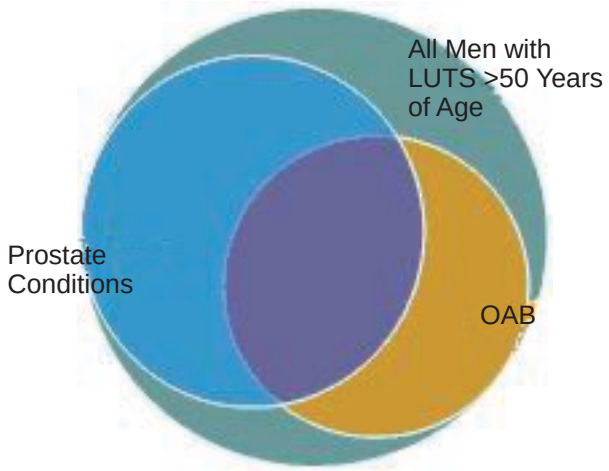

Fig. 1. The overlap of BPE symptoms and OAB symptoms in men older than 50-years of age.

Table 1. Etiology of OAB symptoms

Etiology of OAB symptoms	
Inflammation disorders	UTI (eg bacterial cystitis, prostatitis, TB cystitis)
	Interstitial cystitis
	Irradiation cystitis
	Chemical cystitis (eg Cyclophosphamide cystitis)
	Vaginitis
Anatomic disorders	Bladder outlet obstruction (eg BPH in men, pelvic organ prolapse in women)
	Urethral diverticulum
Neoplasm	Benign or malignant bladder tumor
	Uterine, cervical, vaginal or urethral cancer
Metabolic disorders	Diabetic mellitus
	Diabetic insipitus
Others	Bladder stone or lower ureteral stone
	Neurogenic voiding dysfunction (eg CVA, Parkinsonism, spinal cord injury)
	Non-neurogenic voiding dysfunction
	Psychogenic (anxiety, depression, insomnia)

and obese patients), in order to rule out cystocele causing urethral angulation. A digital rectal examination should be routine for male patients older than 50-year-old to check if there is BPE. Gait and the low back of pediatric patients should be examined to exclude any neurological deficit or meningomyelocele.

Urinalysis is crucial on the patient's first visit. If the report reveals a urinary tract infection, treat it first with antibiotics instead of antimuscarinics. If hematuria is detected, it will be necessary to do further examinations including KUB, renal sonography, intravenous urography and cystoscopy.

A frequency-volume chart, or bladder diary, provides information on daily urine amount, daily fluid intake amount, functional bladder capacity, voiding frequency and the episodes of urine leakage and urge sensation. It helps to differentiate the etiology of urgency and frequency, such as polyuria, polydipsia or psychological stress. Furthermore from the diary the physician is able to determine the severity of the OAB symptoms.

Uroflowmetry and bladder sonography for post-voiding residual (PVR) measurement is optional. However, they will provide much information and are non-invasive. For a patient who is unable to provide a complete 3-day frequency-volume chart, the voiding volume recorded from the uroflowmetry can be used to represent the functional bladder capacity, if the patient urinates as the usual situation. By the way the flow pattern, the flow rate and the PVR help to access whether there is voiding dysfunction.

DO WE NEED URODYNAMICS?

The necessity of an urodynamic study before making a diagnosis of OAB is controversial. Blaivas suggested that an urodynamic test should serve as an essential part of therapy and will help to guide future research into the diagnosis and management of OAB [9]. He stated that if we think of OAB as a symptom complex of unknown etiology and simply seek treatments that ameliorate the symptoms without determining the cause, we stifle research and creativity [10].

Digesu GA et al reported that 1,641 (36.5%) out of 4,500 women with lower urinary tract symptoms who received an urodynamic study had detrusor overactivity (DO) [11], but only 27.5% of the DO patients (457 of 1,641) had OAB symptoms. On the other way, 843 (18.7%) of the 4,500 women with LUTS were classified as having OAB based on clinical symptoms. Of these 843 patients, 54.2% had urodynamically proven detrusor overactivity, whereas 45.8% had a stable urodynamic trace. Based on the results they concluded that diagnosing OAB from urinary symptoms under-diagnoses the detrusor overactivity, which they believed should be treated. Therefore they suggested that an urodynamic study is mandatory in the management of the women with OAB symptoms.

However, "overactive bladder" is not equal to "detrusor overactivity". OAB is a symptomatic diagnosis, whereas DO is an urodynamic diagnosis. In another article, Madersbacher stated that only 50% of patients with OAB have detrusor overactivity and, on the other hand 50% of those who show detrusor overactivity by urodynamics have no clinical symptoms [8]. For the asymptomatic DO patients, detrusor overactivity might be provoked due to the non-physiological bladder infusion rate during the urodynamic study, which is usually faster than normal urine production rate. Therefore DO diagnosed by an urodynamic study is not necessarily significant and asymptomatic DO does not necessarily require therapy.

As the ICS sub-committee stated, *the OAB symptom combinations are suggestive of urodynamically demonstrable detrusor overactivity, but can be due to other forms of urethro-vesical dysfunction*. The sub-committee then suggested that *the term "OAB" could be used if there is no proven infection or other obvious pathology* [1]. It is true that as more investigations are performed on an individual patient, the more likely is it that the underlying pathology will be discovered [2]. However, ahead of defining the term "OAB", the ICS stated that *in clinical practice, empirical diagnoses are often used as the basis for initial management after accessing the individual's lower urinary tract symptoms, physical findings and the results of urinalysis and other indicated investigation*. It thus becomes clear that OAB can be diagnosed and be the basis of empirical therapy without a sophisticated urodynamic study. Wein suggested that urodynamic testing should be reserved for patients where conservative therapies fail or who have a large post-void residual urine volume, a low uroflow and in otherwise complicated or confusing cases [2].

CONCLUSION

For the patients with urinary urgency and one or more of the other symptoms, including urge incontinence, frequency and nocturia, OAB is a tentative diagnosis before the underlying pathology could be discovered. On the other way, OAB is a definitive diagnosis if no pathological condition could be attributed to after a thorough examination. Empirical behavior therapy and antimuscarinic agent therapy may be administered once OAB is diagnosed. However, antimuscarinics are not a panacea for all patients with the OAB symptoms. The physician should re-examine the patient if such empirical therapies fail.

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