

Incidence and Prevalence of Overactive Bladder

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Recent changes in terminology, diagnosis, and therapy have refocused attention on overactive bladder (OAB). This symptom syndrome is highly prevalent worldwide and significantly impairs the quality of life of those who suffer from it.

Accurate epidemiologic incidence and prevalence studies of OAB have been hampered in the past by, among other issues, a generalized lack of agreement regarding definition of the disorder, and consequently, accurate case finding. This obstacle resulted in considerably wide estimates in the reported incidence and prevalence of OAB in the literature. A new symptom-based definition of OAB, formally adopted by the Standardization Committee at a recent International Continence Society meeting, should provide a framework for future epidemiologic studies. Current estimates of incidence, prevalence, effects on quality of life, and societal costs may need to be reassessed based on these new data.

Introduction

The overactive bladder (OAB) is a highly prevalent disorder that impacts the lives of millions of people worldwide. Despite its high prevalence, many sufferers do not seek medical attention and are not aware that OAB is treatable. It is difficult to estimate the true prevalence of bladder overactivity. Despite the considerable impact of bladder storage symptoms on quality of life, many patients never seek medical help and are statistically "invisible." A central element necessary to quantify public health consequences, consistently achieve accurate diagnoses, and successfully treat OAB is a useful, well-accepted definition. Unfortunately, until recently, this crucial element has been lacking. After years of debate, the International Continence Society (ICS) has finally provided a working definition for OAB [1••]. This new definition will provide the framework for more accurate epidemiologic studies in the future. This paper reviews the recent changes in terminology and definition of OAB and introduces a discussion of some of the more recent epidemiologic studies in this area.

Definition of Overactive Bladder

The exact origin of the term OAB is unknown, nevertheless, it became widely utilized and popularized in the medical lexicon in the latter half of the 1990s. Coincident with the rise of this term were several publications [2-4] describing potential problems with its use and expressing confusion about characterization of the condition. As newer and more promising therapies became available it was evident that the term needed clarification. It is interesting that although much argument was engendered by the use of the term OAB, this exact term was never actually defined or described by the ICS in any terminology reports before 2001. The term overactive detrusor function (generally shortened to overactive detrusor) does appear in the lexicon as a finding on urodynamic testing [1••]. This term is defined by the occurrence of involuntary detrusor contractions during the filling phase of cystometry, which may be spontaneous or provoked. Overactive detrusor function was then divided into detrusor hyperreflexia (DH) (due to neurologic disease) and the unstable detrusor (due to a non-neurogenic cause). This latter term was often replaced by the term idiopathic detrusor instability (DI). The term OAB was used interchangeably with overactive detrusor function and overactive detrusor, although it seems clear that this was never the intent of the ICS Standardization of Terminology Committees.

Thus, overactive detrusor function and the terms that, correctly or incorrectly, have been used as substitutes (overactive detrusor, detrusor overactivity, and eventually, OAB) were all urodynamic terms used to describe abnormalities of detrusor function during filling cystometry. A urodynamic study was required to describe the finding of detrusor overactivity, which, in turn, then provided the patient with a de facto diagnosis of OAB, a condition that, strictly speaking, did not even exist as a term in the urologic lexicon. The limitations of this model were recognized by several authors, including Abrams and Wein [2,3]. It was apparent to these and other authors that the requirement of using urodynamics to diagnose OAB placed an undue burden on the practicing physician, the patient, and the healthcare system in general. In addition, the term OAB would need to be formally defined. Artibani [5], Wein [6], and others pointed out several problems in using only a urodynamic-based definition for OAB.

1. Cystometry is an invasive test that requires expensive and complex equipment not widely available

- to practitioners outside of specialized centers, as well as performance, administration, and evaluation of the test by skilled and trained specialists.
2. In light of the high worldwide prevalence of patients with OAB it was not practical nor economically feasible for all patients to be evaluated initially by specialists using cystometry. There were overwhelming numbers of patients who clearly suffered from symptoms of OAB who could benefit from effective therapy, but were undiagnosed due to the relative shortage of urodynamic testing.
 3. The test characteristics of urodynamics in diagnosing OAB are suboptimal. The sensitivity and specificity of this test in detecting involuntary detrusor contractions in patients with OAB symptoms varies with the type of study done, with up to 60% to 80% of patients who are "negative" on routine supine cystometry demonstrating involuntary bladder contractions on either provocative cystometry or ambulatory urodynamics. Also, more than 60% of normal, asymptomatic volunteers demonstrated involuntary detrusor contractions during ambulatory urodynamics.
 4. It was evident to and acknowledged by many clinicians that the overwhelming majority of patients with OAB could be safely diagnosed and treated initially with reversible conservative therapy after a minimal evaluation without urodynamics, and that in this paradigm primary care providers could and should become more involved in the initial management of such patients.
 5. Finally, adoption of the term OAB into the medical lexicon was further supported by the view that it had become a very patient- and physician-friendly term over the years.

Based on these observations, it became apparent that it was necessary to create a definition for OAB that could be utilized as a symptomatic diagnosis sufficient for the initiation of management for the majority of patients, without resorting to complex urodynamic testing. Researchers and clinicians further proposed reserving the term detrusor overactivity or overactive detrusor as a urodynamic definition to describe a particular type of detrusor dysfunction during filling cystometry. Spirited discussions regarding terminology occurred after Abrams and Wein [2] chaired a consensus conference that produced a subsequent publication entitled "The Overactive Bladder: From Basic Science to Clinical Management." Further correspondence on this subject followed [4], finally resulting in the formalization of the term OAB as a recognized symptom complex.

The ICS now classifies OAB as a symptom syndrome suggestive of lower urinary tract dysfunction [1••]. The formation of a Standardization Committee was announced at the ICS meeting in 1999, to resolve increasing debate and discussion about various aspects of terminology. This com-

mittee convened at the annual ICS meeting in August 2000, and at a 2-day committee meeting in London in January 2001, the latter resulting in an approved draft. This draft was subsequently presented to the ICS membership via their official website and at the ICS meeting in Seoul, South Korea in September 2001. Minor changes were made at that point, and the document was formalized after an additional 2 months on the website. Specifically, OAB is now defined as denoting urgency, with or without urge incontinence, usually with frequency and nocturia. Technically, the document refers to OAB as the OAB syndrome. Synonyms include urge syndrome and urgency-frequency syndrome. This particular section of the lexicon revision is introduced by the following quotation [1••]:

Syndromes describe constellations, or varying combinations of symptoms, but cannot be used for precise diagnosis. The use of the word syndrome can only be justified if there is at least one other symptom in addition to the symptom used to describe the syndrome. In scientific communications the incidence of individual symptoms within the syndrome should be stated, in addition to the number of individuals with the syndrome. The syndromes described are functional abnormalities for which a precise cause has not been defined. It is presumed that routine assessment (history taking, physical examination, and other appropriate investigations) has excluded obvious local pathologies, such as those that are infective, neoplastic, metabolic, or hormonal in nature.

The document adds that these symptom combinations are suggestive of detrusor overactivity (defined as urodynamically demonstrable involuntary bladder contractions) but can be caused by other forms of urethrovessical dysfunction. The document implies that OAB is an empiric diagnosis that can be used as the basis for initial management, after assessing the individual's lower urinary tract symptoms, physical findings, urinalysis, and other indicated investigations. The definitions and descriptions were meant to restate or update those presented in previous ICS Standardization of Terminology reports [1••].

These considerations and others prompted the ICS Standardization Subcommittee to also change other items in the ICS lexicon (Table 1). The terms DH and DI were eliminated in favor of neurogenic detrusor overactivity and idiopathic detrusor overactivity. The two former terms had been used as generic terms before the first ICS report in 1976. The most recent Subcommittee felt that because there was no real logic or intuitive meaning to these terms they should be abandoned in favor of others that were more descriptive and readily understood. Additionally, as most experienced clinicians have come to recognize, the extent of neurologic examination and investigation varies in clinical and research practice, and it is likely that the proportion of patients in the neurogenic versus the idio-

Table 1. International Continence Society Terminology

Eliminated	Replacement
Detrusor hyperreflexia	Neurogenic detrusor overactivity
Detrusor instability	Idiopathic detrusor overactivity
Motor urgency	None
Sensory urgency	None
Motor urge incontinence	Detrusor overactivity incontinence with urgency
Reflex incontinence	Detrusor overactivity incontinence without sensation urgency

(From Abrams *et al.* [1••].)

pathic overactivity group would increase if a more complete neurologic assessment were done. The terms motor urgency and sensory urgency have been completely eliminated, with no replacement terms assigned.

Epidemiology of Overactive Bladder: Prevalence
For several reasons it is difficult to estimate the true prevalence of bladder overactivity. First, there have been very few epidemiologic surveys investigating the symptoms of urinary urgency and frequency alone without incontinence. Surveys on the prevalence of urinary incontinence have been done, and estimates of the prevalence of bladder overactivity have been obtained by adding together the fractions with urge incontinence and mixed incontinence [7]. The median prevalence of incontinence in women has been reported as varying from 14% to 40.5% (using the ICS definition, 23.5%), whereas in men it varied from 4.6% to 15%. In women, urge and mixed incontinence accounted for a median relative share of 51% of cases, whereas in men the combined total was 92% [8]. However, it is apparent that many patients suffer from symptoms of OAB but do not have urinary incontinence, and as a consequence are not “captured” by these studies. Fortunately, some recent studies [9,10•,11•] have looked at the proportion of patients with OAB without incontinence, and reasonably accurate estimates of the total OAB population may be obtained with extrapolation of these data. The prevailing methodology used in these studies [9,10•,11•] to estimate the prevalence of OAB appears to have been the multiplication of the rough prevalence of urinary urge incontinence (including mixed incontinence) by three. This calculation estimates that approximately one third of patients with OAB, according to past and current definitions, had urinary urge incontinence, whereas the rest did not, and were manifesting OAB symptoms in the form of urgency, generally with frequency and nocturia [8,9]. Another problem with historic estimates of OAB prevalence is that the definition, as noted above, is relatively

new and does not require urodynamic confirmation. For this reason, historic studies utilizing a strict definition of OAB are subject to the limitations of urodynamic testing, and depending on the patient population may have over- or underestimated the prevalence of this condition. Finally, the methodology of previous studies must be carefully scrutinized. Epidemiologic data on voiding dysfunction, incontinence, and OAB may be obtained via chart review, direct patient questioning, postal questionnaire, and voiding diaries, as well as from urodynamics. Each methodology has its advantages and disadvantages, strengths and weaknesses, and inherent biases. Overestimation and underestimation are problematic. For example, studies that estimated the prevalence of OAB via postal surveys are subject to the biases imposed by questionnaire response rates, which almost never approach 100%. Studies that rely on patient description to characterize incontinence and voiding symptoms are likely subject to recall bias. Even voiding diaries, which are often felt to be the most accurate reflection of voiding behaviors, are problematic. It is well known that attempted patient self-measurement of certain behaviors (including voiding diaries) often result in unrecognized modification of the very behaviors they are supposed to be measuring.

Recently, Milsom *et al.* [10•] reported on a study carried out by the SIFO/Gallup Network in France, Germany, Italy, Spain, Sweden, and the United Kingdom. This study used a telephone questionnaire involving a two-stage screening procedure, first identifying individuals with bladder control problems and then characterizing the nature of the urinary condition. Respondents 40 years of age or older, with OAB only or mixed symptomatology, were included in this study. The first step specifically excluded individuals whose only complaint was a urinary tract infection. Symptoms attributable to OAB were identified by positive responses to specific questions about frequency, urgency, and urge incontinence. Frequency caused by OAB was arbitrarily defined as more than eight micturitions within 24 hours. The working definition of nocturia was having to get up twice or more at night to urinate. Respondents could have more than one OAB symptom, but were classified only once as having an OAB. Positive responses suggestive of only stress incontinence, prostatic obstruction, or the occurrence of urinary tract infection resulted in exclusion from further investigation.

The interviewed population totaled 16,776 subjects. About 19% of all respondents reported current bladder symptoms, but only 16.6% (15.6% of men and 17.4% of women) reported symptoms suggestive of OAB. Responses by country varied somewhat, without explanation. The prevalence of men and women with OAB in Spain was 20% and 24% respectively, whereas the prevalence in France was 11% and 13%, respectively. Seventy-nine percent of the surveyed patients had noted their symptoms for at least 1 year, and 49% had them for greater than 3 years. Of those reporting OAB-related symptomatology,

Table 2. Prevalence of overactive bladder symptoms

Symptom	Prevalence, %
Frequency alone	4.5
Urgency alone	1.5
Urge incontinence alone	1
Frequency and urgency	7
Urgency and incontinence	4.5
Frequency, urgency, and incontinence	3.5

(From Milsom et al. [10].)

frequency was the most commonly reported symptom (85%), followed by urgency (54%) and urge incontinence (36%). The presence of individual symptoms occurring in isolation was small, as was the prevalence of respondents with all symptoms of OAB (Table 2). The prevalence of OAB and of all three symptoms increased with advancing age, a trend apparent in both men and women. For men and women, respectively, prevalence percentages at age 40 to 44 years were 3.4% and 8.7%, at ages 50 to 54 years, 9.8% and 11.9%, at ages 60 to 64 years, 18.9%, and 16.9%, at ages 70 to 74 years, 22.3% and 22.1%, and at or over the age of 75 years, 41.9% and 31.3%.

In this study [10], 65% of men and 67% of women with an OAB reported that their symptoms had an effect on daily living. Sixty percent of those with symptoms found them bothersome enough to consult a medical practitioner. Frequency and urgency alone (59%) were almost as common as urge incontinence (66%) as reasons for seeking help. Of those who sought medical care, only 27% were receiving medication for symptoms at the time of the interview. Of those who were not on medication, 27% had previously tried pharmacologic treatment that failed. Of those who were not on medication and who had never tried drugs, 54% reported they were likely to discuss the problem with a doctor again and 46% were not. Of those who had tried drugs but failed, 65% reported they were likely to discuss the problem with a doctor again, and 35% were not.

Stewart et al. [11] have been conducting the National Overactive Bladder Evaluation (NOBLE) Program to provide a clinically valid research definition of OAB, and to establish estimates of its overall prevalence, the individual burden of illness, and to explore differences between OAB populations who are continent versus those who are incontinent. A computer-assisted telephone interview (CATI) was developed to estimate variation and prevalence of OAB by demographic and other factors. This survey was then assessed for reliability and clinical validity. When clinical validity was assessed by comparison with a clinician's diagnosis, the sensitivity and specificity of the CATI for OAB were 61% and 91%, respectively. This validated United States national telephone survey involved 5204 adults 18 years of age or over, representative of the noninstitutionalized US population with respect to gender, age, and geographic region. Patients with OAB symptoms were characterized as "OAB wet" or "OAB dry."

OAB dry was defined as four or more episodes of urgency in the previous 4 weeks, with either frequency of more than eight or more times per day or the use of one or more coping behaviors to control bladder function. OAB wet included the same criteria as OAB dry, with the addition of three or more episodes of urinary incontinence in the past 4 weeks that were clearly not episodes of stress incontinence. The overall prevalence of OAB was reported as 16.9% in women and 16% in men, with frequency increasing with age. The overall prevalence of OAB dry and OAB wet in women was 7.6% and 9.3%, respectively, whereas in men it was 13.6% and 2.6%, respectively. In the United States these figures would translate to 33.3 million adults with OAB, 12.2 million with incontinence and 21.2 million without. Prevalence by age rose by approximately the same slope in both men and women. The prevalence of OAB dry seemed to level off in men approximately 60 years of age and in women approximately 50 years of age. The prevalence of OAB wet was quite low in men up until approximately 60 years of age, and rose at that point from approximately 3% to approximately 8% at 65 years of age and over. For women, the prevalence of this same condition rose from approximately 12% at 60 years of age to approximately 20% at 65 years of age and over.

Conclusions

Overactive bladder is a highly prevalent disorder that impacts the lives of millions of people worldwide. The importance of OAB as a term has been recognized by the ICS, which now incorporates this term in its lexicon as a symptom syndrome. Prevalence of OAB distinct from urinary incontinence is now the subject of some well-done surveys, and through these we are beginning to characterize the disorder in terms of various demographic features. More accurate estimates of the prevalence of OAB will become increasingly available and important as we try to increase awareness of this significant problem worldwide, and impress upon other specialists and primary care providers the importance of identifying this clinical problem and managing it in a way that will maximize patient quality of life.

References and Recommended Reading

Papers of particular interest, published recently, have been highlighted as:

- Of importance
- Of major importance

- 1.●● Abrams P, Cardozo L, Fall M, et al.: The standardisation of terminology of lower urinary tract function: report from the Standardisation Sub-committee of the International Continence Society. *Neurourol Urodyn* 2002, 21:167-178.

This paper reviews the important and pertinent changes in the ICS lexicon regarding lower urinary terminology. This is an essential and long overdue update.

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6. Wein AJ: **Overactive bladder: defining the disease.** *Am J Manage Care* 2000, **6(11 Suppl)**:S559-564.
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10. • Milsom I, Abrams P, Cardozo L, *et al.*: **How widespread are the symptoms of an overactive bladder and how are they managed? A population-based prevalence study.** *BJU Int* 2001, **87**:760-766.
This paper describes a very large cross-sectional sampling of patients with OAB from several countries in Europe. This is probably one of the first papers to attempt to characterize the OAB population on a large scale.
11. • Stewart W, Herzog R, Wein A, *et al.*: **Prevalence and impact of overactive bladder in the US: results from the NOBLE program.** Paper presented at the Annual Meeting of the International Continence Society. Seoul, Korea. September 18-21, 2001.
This is a well-validated study of patients with OAB.