

# Urogynecological conditions associated with overactive bladder symptoms in women

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## Abstract

**Introduction:** Overactive bladder symptoms (OAB) affect 9–43% of women and are associated with underlying disorders, including pelvic organ prolapse (POP) and stress urinary incontinence (SUI). The aim of this study is to identify urogynecological conditions associated with OAB symptoms.

**Methods:** This prospective, institutional review board-approved study included women referred to a tertiary centre with lower urinary tract symptoms (LUTS). All women completed the self-administered OAB questionnaire (OABSS). Those with an OABSS  $\geq 8$ , the cutoff, were considered to have OAB symptoms. Patients underwent a history and physical examination (including Baden-Walker prolapse grading and stress test), 24-hour voiding diary, pad test (for urinary incontinence), urinalysis, and uroflow with post-void residual volume. Patients were classified clinically into the following: idiopathic OAB, SUI, POP, bladder outlet obstruction (BOO) neurogenic bladder (NGB), recurrent urinary tract infection (UTI), and miscellaneous.

**Results:** In total, 148 women met the inclusion criteria with a mean age of 67 years. Only 27% had no comorbid conditions and were considered idiopathic OAB. Associated urogynecological conditions included SUI in 37%, POP in 26%, miscellaneous conditions in 18%, recurrent UTI in 11%, NGB in 9%, and BOO in 8%. Some patients met criteria for more than one category, thus the total is greater than 100%.

**Conclusions:** In a tertiary care setting, a significant proportion of women with OAB symptoms have underlying conditions that may cause or contribute to their symptoms. Appropriate evaluation is desirable to enhance our understanding of the relationship of these conditions to the diagnosis, treatment, outcomes, and pathophysiology of OAB.

## Introduction

Up to 66% of community-based adult women report lower urinary tract symptoms (LUTS)<sup>1</sup> and it has been estimated that

9–43% have overactive bladder (OAB).<sup>1–5</sup> The International Continence Society (ICS) defines OAB as “urgency, with or without urge incontinence, usually with frequency and nocturia” and now recognizes that OAB is a “symptom syndrome suggestive of lower urinary tract dysfunction.”<sup>6</sup> They recommend that the diagnosis of OAB should be restricted to those in whom urinary tract infection (UTI) and other pathology has been excluded.<sup>5</sup> The aim of this study is define the “other pathology” that presents with OAB symptoms in a tertiary care setting.

In the original ICS terminology, the term OAB was combined with detrusor overactivity (DO).<sup>6</sup> DO is a urodynamic diagnosis, while OAB is a symptom complex;<sup>7</sup> however, over time, the term DO incorrectly became used interchangeably with the term OAB. The ICS confirmed this was not their intent,<sup>6</sup> as it is known that urodynamic DO is demonstrated in only 40–60% of patients with OAB.<sup>8,9</sup> OAB is diagnosed and managed at almost all levels of patient care, with a significant proportion of patients presenting to and being initially managed by their primary care provider. The guidelines for diagnosis and management of OAB were published by the American Urological Association (AUA)/Society of Urodynamics, Female Pelvic Medicine and Urogenital Reconstruction (SUFU).<sup>5</sup> The guidelines suggest a minimum diagnostic evaluation comprised of a history, physical exam, and urinalysis. The purpose of this evaluation is to document symptoms and signs that characterize OAB and exclude other disorders that could be the cause of the patient’s symptoms.<sup>10</sup> These confounding diagnoses are numerous and can include neurological diseases, mobility deficits, medically complicated or uncontrolled diabetes, a history of recurrent UTIs, prior pelvic/vaginal surgeries, pelvic cancer, pelvic radiation, and pelvic organ prolapse (POP).

Studies have shown that DO is present in other urological conditions, including stress urinary incontinence (SUI), POP, bladder outlet obstruction (BOO), impaired detrusor contractility, and neurogenic bladder (NGB).<sup>9</sup> Patients with bladder cancer can also present with symptoms suggestive

of OAB.<sup>11</sup> We have previously reported that 95% of men with OAB have associated urological pathology, the most common of which are benign prostatic hyperplasia (BPH) and prostatic obstruction.<sup>12</sup> In this study, we explore the urogynecological conditions in women presenting with OAB symptoms in a tertiary care setting.

## Methods

### Patient selection

We performed an institutional review board-approved, observational, descriptive study to identify underlying comorbid conditions associated with OAB symptoms. Patients were selected from consecutive women who attended a tertiary outpatient urology referral centre from January 1, 2014 to June 1, 2015 with a chief complaint of LUTS and who completed the Overactive Bladder Symptom Score (OABSS) questionnaire.<sup>13</sup> Those with an OABSS  $\geq 8$ , the cutoff for OAB, were included in the study. All patients underwent an extensive history and physical examination (including Baden-Walker prolapse grading and stress test), a 24-hour voiding diary and pad test (for those with incontinence), urinalysis, uroflowmetry, and determination of post-void residual urine volume. Selected patients underwent urodynamics and cystoscopy. On the basis of this evaluation, patients were classified clinically into one of the following groups: idiopathic OAB, SUI, POP, NGB, recurrent UTI, and miscellaneous.

### Criteria for urogynecological diagnoses

SUI was diagnosed by history and/or demonstrable leakage of urine during cough or Valsalva maneuver with a full bladder on exam and/or urodynamic confirmation of SUI. POP was diagnosed by history and physical examination with a full bladder in the lithotomy position and the grade was evaluated using the Baden-Walker prolapse grading. NGB was diagnosed in patients with a neurological condition known to affect the lower urinary tract, including spinal injury, cerebral vascular accident, Parkinson's disease, multiple sclerosis, and myelopathy. Urethral obstruction was diagnosed by the Blaivas-Groutz nomogram.<sup>14</sup> Recurrent UTI was defined as the persistence of OAB symptoms in patients with three or more episodes of bacterial cystitis in the previous year after undergoing successful antibiotic treatment, as documented by negative urine cultures. Urethral diverticula were diagnosed by voiding cystourethrogram performed at the time of videourodynamics or by magnetic resonance imaging (MRI). Patients who presented with acute cystitis and whose symptoms abated upon appropriate antimicrobial therapy were excluded.

## Results

During the observation period, 195 women with LUTS completed the OABSS. Of these, 148 (76%) had an OABSS  $\geq 8$ , the cutoff for OAB, and were included in the study. Their mean age was 67.3 years (range 20–92). OAB was the most bothersome LUTS in 93 patients (63%) and was their chief complaint in 41% (61 patients). Cystoscopy and videourodynamics were performed in 105 patients (71%). DO was demonstrated in 53 patients (50%) who underwent urodynamics.

The urogynecological conditions associated with OAB symptoms are listed in Table 1 and included SUI in 37%, POP in 26%, miscellaneous conditions in 18%, recurrent UTI in 11%, NGB in 9%, and BOO in 8%. Some patients met criteria for more than one diagnostic category, thus the total is greater than 100%. Overall, 27 patients (18%) were classified as miscellaneous urogynecological conditions and are listed in Table 2. Only 27% of patients had idiopathic OAB without any other associated urogynecological diagnosis.

Of the 38 women with prolapse, the Baden-Walker grade was Grade 1 in five patients (13%), Grade 2 in 17 (45%), Grade 3 in 14 (37%), and Grade 4 in 2 (5.0%). The mean OABSS for the entire cohort was 15.5 for 148 patients. The mean OABSS for each diagnostic category is detailed in Table 1.

## Discussion

It has been estimated that 9–43% of adult women in the general population have OAB.<sup>1–5</sup> It is well-recognized that OAB symptoms are common in other conditions, such as prostatic obstruction in men<sup>12</sup> and Grade 3 and 4 prolapse in women.<sup>15</sup> According to the ICS, patients with persistent OAB symptoms unaccompanied by hematuria or pyuria should be diagnosed with OAB, provided there is no “infection or other proven etiology.” The AUA/SUFU OAB guidelines provide a detailed discussion of what comprises “other proven etiologies,”<sup>5</sup> but there is a paucity of studies that actually quantify the incidence of those other etiologies among patients presenting with OAB symptoms. This data is important because, in our judgment, many physicians, particularly those in primary care, do no more than the cursory evaluation recommended by the AUA/SUFU guidelines and assume the preponderance have idiopathic OAB. This may subject patients to unnecessary, ineffective treatments and deny them early treatment of remediable conditions, such as high-grade POP.

In this series, 73% of women had underlying pathologies that might contribute to their OAB symptoms. Only 27% of patients had true idiopathic OAB. Twenty six percent of women in our study with OAB symptoms had POP. Romanzi et al first noted the association between POP and DO.<sup>15</sup> In that study, 52% of women with Grade 3 and 4 prolapse demonstrated

**Table 1. Comorbid conditions associated with overactive bladder (N=148)**

Diagnosis	Number (%)	Mean OABSS	Median OABSS	SD
Sphincteric incontinence/SUI	55 (37.2)	16.4	17	5.3
Idiopathic	40 (27.0)	14.5	15	4.4
Pelvic organ prolapse	38 (25.7)	14.7	14	5
Miscellaneous	27 (18.2)	15.3	15	4.2
Urinary tract infection	17 (11.5)	15.3	15	5.3
Neurogenic bladder	13 (8.8)	18.2	19	5.6
Bladder outlet obstruction	12 (8.1)	15.4	16	4.8
Total	201 (136.5)	15.5	15	5

Each subject could be represented in more than one diagnostic category, excluding the idiopathic category; thus, the total is greater than 100%. OABSS: overactive bladder symptom score; SD: standard deviation; SUI: stress urinary incontinence.

**Table 2. Miscellaneous diagnoses with OABSS  $\geq 8$  (N=27)**

Urethrovaginal fistula	1
Urethral caruncle	3
Urethral mesh sling	7
Bladder cancer	4
Vesicovaginal fistula	1
Pubovaginal sling	4
Urethral diverticulum	2
Periurethral mass	1
Mesh erosion	2
Bladder lipoma	1
Urethral cyst	1

OABSS: overactive bladder symptom score.

DO vs. 20% with Grade 1 and 2, a significant difference.<sup>15</sup> Foster et al demonstrated that 66% of patients with Grade 3 and 4 POP experienced urgency symptoms, 25% had DO on preoperative urodynamics, and correction with pelvic surgery led to a resolution of symptoms in 55–75% at one year.<sup>16</sup> In this series, 42% of the patients with POP were Grade 3–4; however, OAB symptoms were present even in those with less severe prolapse. Other investigators have found a significant improvement in OAB symptoms up to 53–82% following surgical repair of POP.<sup>17,18</sup> Of course, the mere presence of POP is not an indication for any treatment at all; it is a quality-of-life decision. Nevertheless, we believe that for patients with Grade 3 and 4 POP with refractory OAB, surgical treatment offers the best chance of symptom amelioration.

Eight per cent of the patients in this series had BOO. The association of OAB symptoms with BOO has been well-documented in men with prostatic obstruction, and relief of obstruction ameliorates the OAB symptoms in most patients.<sup>19</sup> It is estimated that 50–75% of men with BOO on urodynamics have OAB symptoms<sup>20</sup> and up to 47% have demonstrable DO.<sup>21</sup> Similarly in women, OAB is the presenting symptom in up to 75–90% of patients with BOO following anti-incontinence surgery.<sup>22,23</sup> Relief of this iatrogenic obstruction has been shown to improve or cure in OAB symptoms for the majority of women.<sup>23,24</sup> This highlights the importance of recognizing the underlying urogynecological conditions associated with the OAB symptom complex and the need to direct therapy to the underlying cause.

The majority of patients in our study (70%) underwent urodynamics. DO was demonstrated in 53 of these patients (50%). These findings are consistent with other studies where urodynamic DO is demonstrated in 40–60% of patients.<sup>8,9</sup> In this series, 37% of patients had SUI in addition to OAB. This is not surprising, as mixed stress and urge incontinence is evident in up to 50% of women with incontinence,<sup>25,26</sup> and approximately 18–67% of these patients have DO on uro-

dynamic evaluation.<sup>25–28</sup> Following sling surgery, studies have shown a resolution rate of 23–93% of OAB symptoms,<sup>27,29</sup> and a resolution of 31% in demonstrable DO.<sup>28</sup>

It is well-known that neurological conditions are frequently accompanied by OAB symptoms and neurogenic DO.<sup>30</sup> Other non-neurogenic causes of OAB symptoms include infection, bladder tumour, and bladder stones.<sup>30,31</sup> As identified in the present study, bladder cancer, even in the absence of hematuria, may present as OAB in women. The clinician should consider this diagnosis because not all bladder cancer presents with hematuria; sometimes, the only symptoms are those of OAB.<sup>11,32</sup> In 18.2%, other less common conditions were identified. The majority (26%) had OAB after implantation of a synthetic mesh sling. De novo OAB is a known complication of suburethral sling insertion and the incidence had been reported to vary from 3.1–25.9%.<sup>33–37</sup> In patients with refractory OAB, sling excision was found to relieve the OAB symptoms in 28–64% of patients.<sup>38</sup>

In our opinion, identifying underlying causes of OAB symptoms should occur before empiric OAB therapies begin. In fact, this is exactly what the AUA guideline panel recommended.<sup>6</sup> To this end, it is important to be sure that the history and physical examination is sufficient to evaluate for the possibility of all of the conditions described above and we also recommend the routine use of a bladder diary. SUI and high-grade POP should be excluded by history and exam. We also recommend that uroflowmetry and post-void residual urine be considered an integral part of the initial evaluation because there is no other way to screen for bladder outlet obstruction. In a prior publication, the authors demonstrated that over 90% of men with OAB symptoms have concomitant urological conditions that should be considered in the differential diagnosis.<sup>12</sup> The present study demonstrates a similar pattern in women; 73% had other urogynecological diagnoses that presented with symptoms of OAB.

This study suffers from both the limitations of a single-institution and retrospective analysis. Firstly, the sample size is relatively small. Secondly, the patients were seen at a tertiary referral centre for voiding dysfunction and, thus, this



sample may not represent those patients found in the general population. Accordingly, the breakdown of the comorbid conditions may not be applicable to other patient populations. However, previous studies in men have demonstrated that the pathophysiology of LUTS in a specialized centre may be representative of those in a primary urological setting.<sup>21</sup> This study is not the first to describe other urological pathologies as coexisting or causing OAB;<sup>11</sup> however, we primarily sought to emphasize that symptoms suggestive of OAB may coincide/present with other urological conditions and complete investigation is necessary before a diagnosis of OAB is made and relevant treatment commenced.

## Conclusion

The majority of women with symptoms of OAB have an underlying urogynecological condition, many of which are remediable to specific medical or surgical treatment. Most OAB guidelines suggest a stepwise, algorithmic approach to the diagnosis; however, a more thorough evaluation, as outlined in this study, even in primary urology and urogynecology settings, would likely lead to an earlier diagnosis and definitive treatment of conditions such as BOO and POP, thus avoiding unnecessary empirical treatments.

**Competing interests:** Dr. Weiss has served as an advisor for Allergan, Astellas, Ferring, Pfizer, and Vantia. Dr. Blaivas is cofounder and CSO of SympIntelligence Medical Informatics. The remaining authors report no competing personal or financial interests.

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