Differential Diagnosis of Overactive Bladder in Men

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Abbreviations and Acronyms

BOO = bladder outlet obstruction

BPE = benign prostatic enlargement

OAB = overactive bladder

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Purpose: We determined the differential diagnosis of concomitant pathological conditions in men with overactive bladder symptoms.

Materials and Methods: We performed an observational, descriptive study to elucidate the differential diagnosis in men with overactive bladder symptoms using a previously validated overactive bladder symptom questionnaire. All patients provided an extensive history, completed the self-administered questionnaire and a 24-hour voiding diary, and underwent physical examination, 24-hour pad test, uroflowmetry, post-void residual urine measurement, cystoscopy and urodynamics. Selection criteria were developed to assign cases to a category, including idiopathic overactive bladder, benign prostatic enlargement, benign prostatic obstruction, neurogenic bladder, bladder cancer, prostate cancer treatment complications, urethral stricture, bladder stones and bladder diverticulum.

Results: Of 122 men who met selection criteria for overactive bladder detrusor overactivity was identified in 99 (79%) on urodynamics. The differential diagnosis was benign prostatic enlargement in 40 men (32%), benign prostatic obstruction in 27 (22%), complications of prostate cancer treatment in 25 (20%), neurogenic bladder in 13 (11%), urethral stricture in 7 (6%), idiopathic overactive bladder in 6 (5%), bladder stone in 2 (2%), bladder cancer in 1 (1%) and bladder diverticulum in 1 (1%).

Conclusions: Overactive bladder is a complex diagnosis with many underlying, contributing urological pathologies. It should be considered a symptom complex and not a syndrome. Knowledge of the differential diagnosis in men with overactive bladder symptoms would hopefully provide clinicians with a diagnostic rubric to more specifically treat such patients with improved success.

Key Words: urinary bladder, overactive; diagnosis, differential; urinary bladder, neurogenic; prostatic hyperplasia; signs and symptoms

Approximately 9% to 16% of the general adult population has OAB symptoms.[1,2] As defined by the International Continence Society, OAB is "urgency, with or without urge incontinence, usually with frequency and nocturia" and "in the absence of infection or other proven etiology."[3] However, often patients with OAB symptoms have other proven etiologies. These concomitant pathological conditions include BPE, prostatic obstruction, neurogenic bladder, infection, bladder carcinoma, bladder stone, sphincteric incontinence and postoperative causes.[2,4–8] The etiology and prevalence of these pathological conditions in patients with OAB are less well-defined.

Research has focused on the relationship between the urodynamic finding of detrusor overactivity and associated urodynamic findings or urological

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Table 1. *OAB differential diagnoses*

Differential Diagnosis	No. Pts (%)
BPE	40 (32)
Benign prostatic obstruction	27 (22)
Prostate Ca treatment complications	25 (20)
Neurogenic bladder	13 (11)
Urethral stricture	7 (6)
Idiopathic OAB	6 (5)
Bladder stone	2 (2)
Bladder Ca	1 (1)
Bladder diverticulum	1 (1)
Total	122 (100)

disorders.[9–11] Limited information is available on the prevalence of associated urological diagnoses in patients with OAB syndrome. We used a previously validated questionnaire to identify patients with OAB[12] and report the prevalence of concomitant urological pathologies in this group.

MATERIALS AND METHODS

We performed an institutional review board approved, observational descriptive study to elucidate the differential diagnosis in men with OAB symptoms. A previously validated OAB symptom questionnaire[12] was administered in consecutive male patients who presented to 2 independent outpatient urology centers for evaluation of lower urinary tract symptoms during 1 year. Study inclusion criteria were based on previously validated results.[12] The questionnaire consisted of 7 questions, each scored on a 5-point scale of 0 to 4.[12] Patients were included in the OAB cohort if their response was scored as 3 or 4 to the question, "How often do you get a sudden urge or desire to urinate that makes you want to stop what you are doing and rush to the bathroom?"

All patients provided an extensive history, completed the self-administered questionnaire and a 24-hour voiding diary, and underwent physical examination, 24-hour pad test (in those with incontinence), uroflowmetry, post-void residual urine measurement, cystoscopy and urodynamics. Study selection criteria were developed to assign patients to a category, including idiopathic OAB, BPE, benign prostatic obstruction, neurogenic bladder, bladder cancer, complications of prostate cancer treatment, urethral stricture, bladder stones and bladder diverticulum.

All questionnaires and completed assessments were reviewed by an independent research associate. Patients were included in the study based on questionnaire results and placed in the appropriate category based on selection criteria. BPE was characterized by prostate size and estimated by digital rectal examination, as modified from the study of Roehrborn et al.[13] Prostate size was graded on a + system of 0 to 4 with the modification 0 representing less than normal prostate size. Prostate size 2+ or greater was categorized as BPE.[13] Prostatic obstruction was diagnosed by a Schafer obstruction grade greater than 2. Complications of prostate cancer treatment were defined as OAB symptoms after radical prostatectomy or radiation therapy without other identified bladder or prostate pathology. Neurogenic bladder was defined as OAB symptoms in the presence of a known neurological disorder, including cerebrovascular accident, myelopathy, Parkinson's disease and multiple sclerosis. Idiopathic OAB was defined as urgency in the absence of the mentioned diagnoses.

RESULTS

In 122 men who met OAB selection criteria mean age was 70 years (median 67, range 28 to 90). Urodynamics revealed detrusor overactivity in 99 men (79%). Table 1 lists differential diagnoses.

Diagnosis in 13 patients with neurogenic bladder was cerebrovascular accident in 6, myelopathy in 4, Parkinson's disease in 1 and multiple sclerosis in 2. Cerebrovascular accident included traumatic hemiparesis, transient ischemic attack and stroke. Myelopathy was due to viral myelopathy, spinal stenosis and surgical trauma.

Based on modified Roehrborn criteria BPE was identified in 56 patients (table 2), of whom 15 had a diagnosis of BOO and 40 had symptomatic BPE without another diagnosis. OAB developed in 25 men after treatment for prostate cancer. Radical prostatectomy was done in 21 men and all had sphincteric incontinence and OAB. Four men had undergone radiation, including brachytherapy in 2, and brachytherapy and external beam radiotherapy in 2. Two of the latter patients also had urethral obstruction.

Table 2. *Prostate size in all patients*

Prostate Size	No. Pts (%)
0	15 (15)
1+	25 (25)
2+	44 (44)
3+	8 (8)
4+	4 (5)
Unknown	3 (3)
Total	99*
Benign prostatic obstruction:	
0	3 (13)
1+	4 (17)
2+	13 (57)
3+	3 (13)
4+	0
Total	23
No benign prostatic obstruction:	
0	12 (16)
1+	21 (28)
2+	31 (40)
3+	5 (7)
4+	4 (5)
Unknown	3 (4)
Total	76

* Omitting men with prostate cancer.

DISCUSSION

As defined by the International Continence Society, OAB indicates a symptom complex comprising "urgency, with or without urge incontinence, usually with frequency and nocturia. . . in the absence of infection or other proven etiology."[3] This definition fails to address the well-known differential diagnosis of OAB and the pathological conditions associated with these lower urinary tract symptoms. We noted the prevalence of concomitant urological pathologies in these men identified with OAB using a validated questionnaire.[12] Our study suggests that most men with OAB have concomitant urological diagnoses. The data show that the most common diagnoses were BPE (32% of cases), BOO (22%) and complications of prostate cancer treatment (20%). Truly idiopathic OAB was found in only 5% of this population. Considering this differential diagnosis intellectually engages the physician to consider new diagnostic and treatment algorithms that may be more precise and effective.

Current OAB treatment algorithms assume that "OAB is an empiric diagnosis that can be used for the initial management after assessing symptoms"[14] and anticholinergic therapy remains the mainstay empirical regimen prescribed. Due to the paucity of well controlled clinical studies there is insufficient evidence to determine whether any other medications are better or worse than anticholinergic therapy.[15] This rationale may result in suboptimal treatment, as in men with unidentified prostatic obstruction who present predominantly with urgency and are treated with anticholinergics. In this population 22% of patients with OAB symptoms had BOO. These patients may derive more benefit from treatments directed at relieving BOO.

Approximately 50% to 75% of men with BOO on urodynamics have OAB symptoms[16] and it is estimated that between 46% and 66% with prostatic obstruction on urodynamics have detrusor overactivity.[9–11] It was recently suggested that patients on combined tamsulosin and tolterodine therapy for lower urinary tract symptoms with urgency and frequency have significantly greater perception of treatment benefit compared to those on monotherapy or placebo.[17] Since therapy with tolterodine alone did not provide the same improvement, treating prostatic obstruction may provide benefit in patients with OAB symptoms and BOO. In men with OAB and prostatic obstruction surgical treatment for obstruction relieves detrusor overactivity and at least by implication OAB symptoms should also resolve. This has been the case in our clinical experience. Kageyama et al reported that certain detrusor overactivity patterns in patients with prostatic obstruction were completely alleviated after transurethral prostate resection.[18] In another small series detrusor overactivity resolved on urodynamics in 75% of patients after transurethral prostate resection.[19] Thus, treating BOO may provide more benefit since improvement on anticholinergics depends on patients continuing the medication indefinitely but most discontinue it within a few months because of dissatisfaction with the level of improvement and/or side effects.[20]

In our series 56 men had BPE, of whom 16 also had BOO. The remaining 40 patients had symptomatic BPE without urodynamic evidence of obstruction. We do not claim that BPE causes OAB but do not exclude the possibility that a pathophysiological relationship exists. Thus, it is important to include BPE as part of the differential diagnosis. Furthermore, patients with BPE are already being treated empirically with 5α-reductase inhibitors, implying that at least some practitioners believe that BPE is a pathological condition that should be diagnosed and treated.

In our series OAB developed in 25 men (20%) after prostate cancer treatment. Sphincteric incontinence often develops after radical prostatectomy but it appears less well-known that these patients may also have OAB requiring treatment. After prostatectomy about 12% of men with sphincteric incontinence also have detrusor overactivity on urodynamics.[21] Also, after prostate cancer treatment patients may have OAB and urethral obstruction. In our experience successful treatment for urethral obstruction often relieves OAB symptoms.

OAB may be the presenting symptom of bladder cancer even in the absence of hematuria. Although they were not included in this series, we treated 3 patients without hematuria empirically with anticholinergics for up to 18 months for what proved to be invasive bladder cancer. Two such patients ultimately died of metastatic disease.

This study is not the first to describe other urological pathologies as coexisting or causing OAB. Concomitant pathological conditions with symptoms dominated by OAB are documented in the literature. Lower urinary tract obstruction, including BPE and primary bladder neck dysfunction, may coexist with or be a cause of OAB.[4,7] In 1 series the most commonly diagnosed causes of OAB were neurogenic bladder and prostatic obstruction.[2] Other concomitant disorders were nonneurogenic causes, such as infection, bladder tumor, sphincteric incontinence, postoperative pathological conditions and bladder stones.[2,5] Neurogenic etiologies include cerebrovascular accident, Parkinson's disease, multiple sclerosis, spinal cord injury and myelodysplasia.[5–8] Many of these urological disorders related to OAB have been described in urodynamic studies.

Flisser et al characterized urodynamic data in a series of men and women with OAB symptoms and tabulated various associated diagnoses, including BPE in 28% of cases, sphincteric incontinence in 17%, idiopathic urge incontinence in 29% and uterovaginal or bladder prolapse in 17%.[22] Another 11% of patients had BOO, impaired detrusor contractility or neurogenic bladder conditions."

The study has several limitations. Data collection was limited by the relatively small database and the retrospective nature of the analysis. Many patients were seen at a urological center specializing in lower urinary tract disorders, which may have increased the likelihood that the cohort does represent the general male population. However, we previously reported that the pathophysiology underlying symptoms in men with lower urinary tract symptoms was similar in a primary urological setting and at a specialized center.[9] Although patient age was 28 to 90 years, median age was 67 years. Thus, results may not represent the general population. Women were not included in the study but they were studied later. The differential diagnosis in a population of women will be submitted for review.

CONCLUSIONS

OAB should be considered a symptom complex and not a syndrome. A syndrome is "the aggregate of symptoms and signs associated with any morbid process, together constituting the picture of the disease."[23] OAB should not be considered a disease entity but a complex diagnosis with many underlying contributing urological pathologies. Knowledge of the differential diagnosis in men with OAB symptoms would hopefully provide clinicians with a diagnostic rubric to more specifically treat such patients with improved success.

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EDITORIAL COMMENT

These authors make the important point that OAB, as a complex diagnosis with many underlying contributing urological pathologies and many causes, should be considered a symptom complex and not a syndrome. I do not believe that OAB is a symptom complex. By definition it is simply urgency. While it is not generally considered in this way, urgency alone is sufficient for the diagnosis. OAB is urgency with or without urge incontinence, usually with frequency and nocturia. One can have incontinence, frequency and nocturia without OAB or urgency alone and have OAB. However, while urgency is defined, it is an unclear, often debated concept that is undergoing scrutiny. If we can debate the interpretation of urgency, and OAB can be a singularity and, as I suggest, not a syndrome or symptom complex, what is it? Until this is clarified we should be careful how we use these terms.

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