A 14-year-old male was evaluated and treated for frequent urination associated with straining to void, a sensation of incomplete emptying, and nocturia. Treatment and outcomes are presented in this article.

**Key Words:** Urinary frequency, constipation, urinary tract infection, oxybutynin, Ditropan® XL, anticholinergic therapy, urodynamics, children, pediatrics.

**Objectives**
1. Discuss overactive bladder assessment in children.

A 14-year-old male presented to the pediatric urology office at the request of his pediatrician for evaluation and management of an acute onset of frequent urination associated with straining to void, a sensation of incomplete emptying, and nocturia starting 4 days prior to his visit. He denied hematuria, dysuria, flank or suprapubic pain, or fevers/chills. He did note recent constipation but denied changes in his gait. He denied drinking caffeinated or highly acidic fluids.

**CASE STUDY**

**Past Medical History**
Right nephrectomy for a multicystic dysplastic kidney at 6 months of age. Other relevant information – a urinalysis and culture were normal.

**Physical Examination**
Will is a healthy adolescent male in no apparent distress; his abdominal and genital examinations are normal, and his bladder is not palpable. There are no visible or palpable presacral or sacral abnormalities. Gait and uroflow study are normal. His initial postvoid residual (PVR) was 30 mL, which he was subsequently able to void on a second attempt. He admits to straining to void during the study.

**Management**
Initial management was a bowel regimen (increased fluids and fiber intake, as well as timed attempts for bowel movements) and a voiding regimen (timed and double voiding). He was seen shortly thereafter for increased urinary frequency and nocturia. PVR at that time demonstrated no residual void, and he was started on oxybutynin XL (Ditropan® XL) 5 mg once daily, which was increased to 10 mg over the week. Due to persistence of symptoms and parental anxiety, a urodynamics study was obtained (see Figure 1), which demonstrated detrusor overactivity. The dose of oxybutynin XL was increased to 20 mg before his symptoms resolved. An MRI of his lumbosacral spine was obtained due to the acute onset and severity of his symptoms and his change in bowel habits. There was no evidence of a tethered cord. Anticholinergic therapy was weaned and discontinued one month later with no recurrence.

**DISCUSSION**

**Results of Clinical Interaction**
The initial presentation was suspicious for dysfunctional voiding with the presence of straining to void, incomplete emptying, and constipation. Thus, a behavioral regimen was not effective, and the patient was referred for further evaluation. The key to management in this case was a combination of behavioral therapy and medical management with anticholinergic medication. The MRI ruled out any structural abnormality that could be causing the symptoms. The patient responded well to the treatment regimen, and his symptoms resolved.

**Note:** Pamela Ellsworth, MD, FAAP, FACS, disclosed that she is on the speakers’ Bureau and Advisory Boards for Pfizer, Allergan, and Novartis. She also discloses that some pharmacologic therapies that are not FDA-approved for use in children are presented, including alpha blockers and some anticholinergic agents, as well as use of minimally invasive procedures. Lack of approval is noted.

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Figure 1.
Urodynamics Study Demonstrating Detrusor Overactivity
instituted to treat both underlying bowel and bladder problems. At follow up, urinary frequency, nocturia, and a normal PVR were more indicative of overactive bladder. The severity of his symptoms and the anxiety and concerns of the parents and child prompted the increase of oxybutynin XL and the urodynamic test. The acute presentation associated with a change in bowel habits prompted the MRI to rule out a neurologic cause of his symptoms.

Assessment of Overactive Bladder in Children

There are other causes of overactive bladder symptoms that need to be ruled out in the initial evaluation of children presenting with overactive bladder symptoms. A physical examination is important to assess structural abnormalities, such as a distended bladder, meatal stenosis, signs of a neurologic etiology (such as abnormal presacral area [sacral dimple, hairy tuft, abnormal gluteal cleft] and abnormal gait). The history is important to identify constipation, which can aggravate bladder symptoms and become more problematic if not treated prior to the addition of anticholinergic therapy. Posterior urethral valves must be ruled out in boys with urinary incontinence and other bladder symptoms. Urinary tract infections may mimic overactive bladder symptoms, requiring the need for a urinalysis. Uncontrolled diabetes mellitus may lead to glucosuria and increased urine output, leading to urinary frequency, and rarely polydypsia can lead to overactive bladder symptoms. A careful history, physical examination, and uroflow/electromyogram (EMG) will allow differentiation between overactive bladder and other forms of voiding dysfunction.

CLINICAL IMPLICATIONS

Medical Considerations

Oxybutynin is the only anticholinergic agent approved for use in children. The clinical response to anticholinergic therapy is usually noted at one week, with further improvement noted by four weeks. Side effects of anticholinergic agents are common, especially dry mouth and constipation, and often affect compliance with therapy. The development of once-daily formulations has made these agents more tolerable. Pre-treatment of underlying constipation with anticholinergic therapy decreases the risk of significant constipation. Contrary to overactive bladder patterns in adults, overactive bladder in children is believed to be a transient bladder condition; however, there is little information regarding the duration of symptoms in children.

Nursing Considerations

Maximal improvement in overactive bladder symptoms is achieved through a combined approach utilizing behavioral therapy in addition to anticholinergic therapy. Behavioral therapy includes education regarding the condition, timed voiding and bowel regimens (increased fluid/fiber intake and laxatives), and appropriate fluid intake, both type (avoiding caffeinated and highly acidic fluids) and volume (concentrated urine acts as a bladder irritant). Patients should receive instructions regarding pelvic floor muscle exercises, which are useful in suppressing uninhibited bladder contractions.

QUALITY-OF-LIFE ISSUES

Overactive bladder symptoms greatly impact the quality of life in both children and adults. As with adults, children may become depressed and withdraw from social activities, such as after-school sports, field trips, or going to a friend’s house. Children with overactive bladder may also fear being ridiculed by their peers or teachers for using the bathroom frequently, and many complain that their teachers do not allow them to go to the bathroom during class time.

CONCLUSION

Overactive bladder occurs in children and must be differentiated from other forms of voiding dysfunction. It is often associated with constipation, which may exacerbate the overactive bladder symptoms and contribute to the risk of urinary tract infections. In older children, as with the child in this case, symptoms may be debilitating and have a significant effect on quality of life. When initial management with anticholinergic and behavioral therapy fails, urodynamic studies may be useful to confirm the diagnosis and help determine further therapy. As with adults, evaluation of overactive bladder symptoms requires a careful history, physical examination, and urinalysis to rule out other possible causes of such symptoms, such as urinary tract infections, diabetes mellitus, and neurologic abnormalities. Unlike adults, overactive bladder symptoms in children tend to be transient.