Neurogenic Bladder and Its Management

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KEYWORDS

• Neurogenic bladder • Voiding dysfunction • Cerebrovascular accident
• Parkinson disease • Cerebral palsy • Spinal cord injury • Multiple sclerosis
• Transverse myelitis

KEY POINTS

- Neurogenic bladder dysfunction can be caused by several neurologic conditions.
- It is important to recognize patients with neuropathic voiding dysfunction to manage any upper tract damage that can occur as a result.
- Treatment of neuropathic voiding dysfunction is aimed at maintaining adequate storage and drainage in a low-pressure system without upper tract damage or infection while maintaining continence
- Goals of therapy also include improving patient quality of life.

BACKGROUND

The functions of the lower urinary tract (LUT) are to store and eliminate urine. This is a coordinated behavior between the brain, spinal cord, urinary bladder, and outlet. For the bladder to empty, the bladder contracts, which is under control of the parasympathetic system, in coordination with relaxation of the sphincter, under control of the somatic nervous system. Disturbances in the nervous system that controls the LUT can lead to neuropathic voiding dysfunction or neurogenic bladder (NGB). NGB is a term used to denote LUT symptoms (LUTS) as a sequela of neurologic disease. It is important to recognize patients at risk because long-term effects of NGB can result in later upper tract dysfunction and renal damage and concomitant LUT deterioration. The risk of developing upper tract damage is highest in patients with traumatic neurologic disorders, such as spinal cord injury (SCI) and spina bifida, versus nontraumatic slow progressive disorders.[1] Other complications of having an NGB include hydronephrosis, urinary tract infections, and urinary calculi. Thus, it is important to keep in mind that these patients can also experience sexual dysfunction.

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RISK FACTORS AND EPIDEMIOLOGY

Neuropathic voiding dysfunction can be caused by various diseases or events that affect the nervous systems controlling the LUT. The location of the extent of the neurologic lesion dictate the extent of LUT damage (European Association of Urology guidelines, 2017). NGB dysfunction may arise as a result of several neurologic conditions. NGB has been found in 40% to 90% of patients in the United States with multiple sclerosis (MS), 37% to 72% of patients with parkinsonism, and 15% of patients with stroke.[2,3] It is estimated that up to 70% to 84% of patients with SCI have some component of voiding dysfunction.[2,4] In a recent retrospective study performed by Bulent,[5] the median patient age for SCI was 33 years (ages ranged from 18–75). The leading causes of SCI were motor vehicle accidents (40%) and falls (29%). Upper urinary tract deterioration as a serious complication of NGB was determined in 25% of patients. Less common scenarios for NGB may include diabetes mellitus with autonomic neuropathy, complications from pelvic surgery, and cauda equine syndrome due to lumbar spine pathology.[2]

EXAMINATION

Patients with NGB can experience irritative voiding symptoms, such as urinary frequency, urgency, nocturia, and urgency incontinence. Early diagnosis and treatment are essential for prevention of all these conditions, requiring a detailed history and physical examination. These should include past and present symptoms. Attention to fluid intake, voiding habits, and presence of incontinence is important. Inclusion of a bowel history, obstetric history, and sexual history is also important because all histories can be affected. During examination, it is vital to examine a patient's back, looking for a sacral dimple or hair tuft that could be a sign of occult spina bifida. It is also important to perform a thorough neurologic examination to identify sensory or motor function deficits. If incomplete bladder emptying is suspected, then a postvoid residual should be obtained because some patients may have incomplete voiding without appropriate sensation.

Laboratory Examination

Obtaining a urinalysis and urine culture is warranted; however, treatment of bacteriuria in patients with indwelling catheters or those performing intermittent self-catheterization is not routinely recommended for identification of asymptomatic bacteriuria given frequent colonization. Treatment in these patients is only recommended in the context of symptoms. Symptoms of UTI in these patients include fever, suprapubic pain, flank pain hematuria, abrupt change in continence, and autonomic dysreflexia (AD) in those susceptible. Urine odor is often an associated complaint; however, it must be accompanied by other symptoms, listed previously, and not treated in isolation. Other laboratory tests to be considered include serum creatinine and glomerular filtration rate to monitor renal function and prostate-specific antigen in appropriate patients.

Urodynamics

Urodynamics (UDS) provides a way to help evaluate and manage the bladder in patients with certain neurologic conditions. In a report by Kaplan and colleagues,[6] there was a general correlation between the neurologic level of injury and the expected vesicourethral function, but it was neither absolute nor specific, and UDS provides a more precise diagnosis for each patient. If there is any suspicion for upper tract deterioration from bladder symptomatology, then UDS is warranted.