Lower Urinary Tract Symptoms (LUTS) in Middle-Aged and Elderly Men

JMAJ 47(12): 543–548, 2004

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Abstract: Lower urinary tract symptoms (LUTS) include storage symptoms (previously termed as irritative symptoms), voiding symptoms (previously termed as obstructive symptoms) and post-micturition symptoms. The International Continence Society (ICS) published a new standardization of terminology of lower urinary tract function in 2002. Storage symptoms include increased daytime frequency, nocturia, urgency and incontinence. Of incontinence, stress, urge and mixed incontinence are the major symptoms, and ICS has also defined enuresis, continuous incontinence and giggle incontinence as other types of incontinence. Urgency, with or without urge incontinence, usually with frequency and nocturia, can be described as overactive bladder (OAB) syndrome, urge syndrome, or urgency/frequency syndrome. These syndromes suggest urodynamically demonstrable detrusor overactivity, but may be due to other forms of urethro-vesical dysfunction. Overactive bladder is an empirical diagnosis used as the basis for initial management after assessing lower urinary tract symptoms, physical findings, urinalysis, and other indicated evaluation. Voiding symptoms include slow stream, splitting or spraying, intermittency, hesitancy, straining and terminal dribble. Post micturition symptoms include a feeling of incomplete emptying and post micturition dribble. The “feeling of incomplete emptying” symptom was formerly categorized as either a storage symptom or a voiding symptom, but has been categorized among the post micturition symptoms in the new ICS terminology. “Post micturition dribble” is the term used when an individual describes the involuntary loss of urine immediately after he/she has finished passing urine, usually in men after leaving the toilet. Thus this symptom is not incontinence, and is categorized among the post micturition symptoms.

Key words: Lower urinary tract symptoms; Men; Overactive bladder; Incontinence; International Continence Society
Introduction

In middle-aged and elderly men, various urination disorders are caused by urinary tract obstruction due to prostatic hyperplasia and other diseases, as well as neurogenic bladder due to neurological diseases such as cerebral infarction.

Urination symptoms caused by these urination disorders are generally referred to as lower urinary tract symptoms (LUTS). As urination disorders are classified into storage disorders and voiding disorders, LUTS are accordingly classified into storage symptoms and voiding symptoms.

The terms related to lower urinary tract function, including LUTS, are defined by the International Continence Society (ICS), and the standard terminology was redefined in 2002. The new definition includes a new category of post micturition symptoms, in addition to conventional storage and voiding symptoms. This article explains LUTS according to the new terminology.

Storage Symptoms

Storage symptoms are symptoms occurring in the storage phase, such as increased daytime frequency, nocturia, urgency, and incontinence (Fig. 1). These symptoms were previously called irritative symptoms because they appeared as if resulting from irritation of the bladder. However, the term “storage symptoms” is now preferred because they actually are not related to irritation.

1. Increased daytime frequency or pollakiuria

This refers to an abnormal increase in the frequency of urination. The normal frequency of urination in adults is considered to be 4 to 6 times a day. Hence, a frequency of 8 times or more a day is regarded to constitute increased daytime frequency. The cause of this symptom is the decrease in functional bladder capacity (maximum bladder capacity minus residual urine volume). This may result either from decreased maximum bladder capacity as a result of overactive bladder (see below) or from the decrease in single voided volume reflecting the increase in residual urine.

When an abnormal increase in urine volume (diabetes insipidus) increases the frequency of urination, this condition is called polyuria. Polyuria is defined by a daily urine volume of 2,800 ml or more.
2. Nocturia
Nocturia is defined as waking at night to urinate. The ICS standard defines it as rising from sleep to void once or more at night. However, because voiding once at night is not rare in persons aged 50 or more, nocturia is often considered as voiding more than once at night. Nocturnal polyuria needs to be differentiated from nocturia. Nocturnal polyuria is a condition in which nighttime (from 23:00 to 7:00) urine volume is 33% or more (20% or more for young adults) of daily urine volume.

3. Urgency
Urgency is a sudden compelling desire to void with a feeling that micturition is imminent. The former definition classified urgency into motor urgency associated with overactive contraction of the detrusor muscle and sensory urgency caused by hypersensitivity of the bladder and the urethra in the absence of overactive contraction. However, because the distinction between motor urgency and sensory urgency cannot be shown clearly even by the use of advanced urodynamic tests, the revised terminology does not divide urgency into these types.

4. Urinary incontinence
(1) Stress urinary incontinence
This refers to the leaking of urine that occurs during effort or exertion causing sudden increases in abdominal pressure, such as coughing, straining, laughing, standing up from a sitting position, and lifting heavy objects. A cause of stress urinary incontinence is anatomical abnormalities involving weakening of supporting tissues around the bladder neck and the proximal urethra. Other causes include hypermobility of the fundus of bladder (Types I and II) and neurogenic conditions (intrinsic sphincter deficiency; ISD, Type III).

Stress urinary incontinence usually occurs in women. It is seen in middle-aged and elderly men after prostate surgery, in particular when the urethral sphincter muscle has been damaged in radical prostatectomy.

(2) Urge urinary incontinence
This refers to incontinence accompanying urgency. The cause is overactive contraction of the detrusor muscle. While detrusor overactivity is usually seen in the supranuclear neurogenic bladder due to cerebral infarction or cervical spondylosis, it also arises from lower urinary tract obstruction due to prostatic hyperplasia and from unknown causes.

Although the former was called detrusor hypersensitivity and the latter was called unstable bladder in the past, it is difficult to strictly differentiate these 2 conditions. The new definition, therefore, classifies into neurogenic and idiopathic detrusor overactivity (DO). Urge incontinence is the most commonly observed type of incontinence among middle-aged and elderly men.

[Overactive bladder (OAB)]
While detrusor overactivity is considered the cause of increased daytime frequency, urgency, and urge incontinence, the diagnosis of detrusor overactivity requires urodynamic testing to evaluate urination functions.

Diagnosis based on a urodynamic observation may vary depending on whether it is conventional cystometry or a new method such as ambulatory urodynamics (the measurement of intravesical pressure in essentially the same manner as Holter ECG), as well as whether the test is performed by a specialist in urination, a general physician, a technician, or a nurse. In addition, we cannot diagnose OAB with 100% reliability even when advanced urodynamic studies are performed.

Therefore, we need to be able to define conditions considered to arise from overactive detrusor based on symptoms in daily practice. For this reason, the ICS has defined such conditions as overactive bladder (syndrome). OAB is characterized by urinary urgency and typically accompanies increased daytime frequency and nocturia. There are 2 types of OAB: one with urge incontinence (OAB wet) and one without (OAB dry). The ICS considers
OAB to be synonymous with urge syndrome and urgency/frequency syndrome.

These terms are considered to lack scientific significance and should be used for initial micturition management based on empirical diagnosis in daily practice after the evaluation of symptoms and physical findings, and exclusion of organic disorders.1)

(3) Mixed incontinence

This type of incontinence is defined by the presence of both stress incontinence and urge incontinence.

(4) Enuresis and nocturnal enuresis

Enuresis is any involuntary urine leakage and usually refers to that occurring at night. Nocturnal enuresis is urine leakage occurring at night.

(5) Continuous incontinence

This is defined as continuous occurrence of urine incontinence. Continuous incontinence is considered the same as what was previously called total incontinence.2) In this condition, the bladder lacks the ability to store urine and works only as a channel for urine flow from the ureters to the urethra, resulting in the slow leakage of urine from the external urethral orifice. A congenital anomaly called myelomeningocele sometimes accompanies this condition. The incontinence seen in the cases of ectopic ureteral opening and vesicovaginal fistula is defined as extra-urethral incontinence.1,2)

(6) Other types of incontinence

There are other types of incontinence such as coitus incontinence, giggle incontinence, etc.

(7) Incontinence not defined in new ICS terminology

The following types of incontinence were defined in the 1988 terminology but were excluded from the new version:

a. Reflex incontinence: Reflex incontinence is seen in spine diseases at the lumbar or higher level without impairment of the sacral micturition center. The patient feels no voiding desire. When a certain amount of urine is stored in the bladder, the detrusor muscle contracts reflexively and causes urine leakage. While this condition with reflex contraction was previously called reflex bladder, it was unified in the above-mentioned category of neurogenic overactive detrusor. Because patients with reflex incontinence often have impairment in coordination between the detrusor muscle and the sphincter muscle of the urethra, they are at an elevated risk of upper urinary tract impairment and urinary tract infection due to high-pressure voiding and residual urine.2)

b. Overflow incontinence: Overflow incontinence occurs in cases with urinary retention or a large volume of residual urine. Physical activities that increase abdominal pressure cause overflowing of the urine stored in the bladder. This condition may occur in cases of prostatic hyperplasia developing advanced voiding impairment. Such cases need sufficient attention because there is a risk for upper urinary tract impairment. This condition is diagnosed based on the ultrasound confirmation of the presence of a large amount of residual urine. Treatment consists of urethral catheterization and treatment for voiding impairment.

c. Functional incontinence: Functional incontinence includes incontinence due to difficulty in moving and that due to dementia. Patients with incontinence due to difficulty in moving, patients with motor paralysis, parkinsonian syndrome, bone fracture, arthralgia, etc. feel a voiding desire and want to go to the bathroom, but are prevented from completing voiding actions because they are unable to reach the bathroom in time, assume a voiding posture, or remove their clothes. Incontinence due to dementia may result from disorientation, lack of comprehension, or attention deficit. Patients urinate in corners of rooms, entrance halls, corridors, or other inappropriate places because they do not know the location of the toilet, they do not understand how to use the toilet, they mistake the place for the toilet, they want to attract the attention of caregivers and other persons around them, or they want to embarrass them.
5. Bladder sensation
The new definition by the ICS classifies bladder sensation into 5 categories of normal, increased, reduced, absent, and non-specific.

Voiding Symptoms
Voiding symptoms include difficulties experienced during the voiding phase, such as slow stream, splitting or spraying, intermittency, hesitancy, straining to void, and terminal dribble.

Urinary retention is the condition with a total inability to void or very limited voiding. The former is called complete urinary retention, the latter incomplete urinary retention.

Post Micturition Symptoms
This term was newly defined in the revised terminology. These include symptoms observed shortly after voiding.

1. Feeling of incomplete emptying
While this symptom can be regarded as a voiding symptom (feeling of the presence of residual urine as a result of e.g., prostatic hyperplasia), it can also be regarded as a storage symptom (e.g., bladder irritation due to cystitis or prostatitis). Authors of reports in the past, therefore, classified this symptom into either of these categories. The new terminology classifies it into the new category of post micturition symptoms.

2. Post micturition dribble
Post micturition dribble in men is the dribbling of urine remaining in the urethra after the end of voiding. While “terminal dribble” refers to the dribbling of urine for several seconds or a few minutes at the end of micturition following the main urinary stream, this should be distinguished from post micturition dribble. The volume of dribbling urine is several milliliters at maximum. The urine remaining in the urethra is discharged by the action of the bulbocavernosus muscle. Probably due to the weakening of the contraction of this muscle in those aged over 40, post micturition dribble is not rare in men at these ages. Hence, in contrast with terminal dribble, post micturition dribble is usually not abnormal. Women sometimes experience dribbling shortly after standing up from the toilet.

Lower Urinary Tract Symptom Score
The scoring of symptoms is a useful means of evaluating LUTS, determining severity, and assessing treatment effects. The International Prostate Symptom Score (IPSS) is a scoring system that is most commonly used in prostatic hyperplasia.

The IPSS consists of 3 items regarding storage symptoms (frequency, urgency, nocturia), 3 items regarding voiding symptoms (intermittency, slow stream, straining to void), and an item regarding post micturition symptoms (feeling of incomplete emptying): 7 items in total. Each item is evaluated in a 6-point score from 0 (never) to 5 (almost always). According to the Guidelines on Benign Prostatic Hyperplasia, total scores of 8 or less represent mild symptoms, 9–15, moderate, and 16–35, severe. In addition, a quality of life (QOL) score evaluates the patient’s satisfaction with the current urination condition in a 7-point score from 0 (very satisfied) to 6 (very unsatisfied).

Since the presence of symptoms is an essential prerequisite for diagnosis of prostatic hyperplasia, the evaluation of LUTS is considered extremely important. However, the IPSS is poorly correlated with lower urinary tract functions and prostatic obstruction diagnosed based on urodynamic studies (including pressure/flow study). Other problems have also been pointed out, such as that the 6-point scoring in the IPSS is too detailed, the score evaluates only the frequency of symptoms without regarding degree of symptoms, and that the questions (in Japanese translation) cannot be easily understood by Japanese
patients. Because the content of the IPSS is not specific to prostatic hyperplasia, this score can be used to evaluate various voiding dysfunctions including those in women.

Aside from the IPSS, several LUTS scores have been proposed such as the Danish-PSS and the ICS score. Japanese urologists are developing a LUTS score that would be comprehensible to Japanese and correlate with lower urinary tract functions.

Symptom scores and QOL scores for the evaluation of urinary incontinence have also been proposed, including the Urogenital Distress Inventory (UDI)-6 and the International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF).5)

**Points in Interviews with Patients**

When we ask a patient about his condition, we need to: (1) clarify whether he has LUTS or not; (2) if there are LUTS, classify them into storage symptoms and voiding symptoms; and (3) ask about the degree of LUTS in detail and score these symptoms. It may seem easy to clarify whether the patient has LUTS or not, but this is actually rather difficult because many patients are not aware of the presence of abnormal symptoms.

Generally, voiding symptoms that have developed chronically are less likely to be realized by patients because distress from such symptoms tends to be relatively mild. On the other hand, patients are usually aware of storage symptoms because they cause distress. To obtain accurate information on incontinence and other storage symptoms, it is advisable to instruct patients to record the time and amount of urination, as well as the time and amount of involuntary urine loss, for several days using frequency volume charts.

**REFERENCES**


