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Approximately 75 per cent of patients diagnosed with multiple sclerosis will develop bladder symptoms. These usually result from the disease affecting the spinal cord and consequent impaired mobility. Bladder symptoms often become worse as lower limb disability increases. Collette Haslam explains why appropriate management strategies must be established for individual patients and their current level of disability

KEY WORDS

**Multiple sclerosis
Bladder
Management**

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Managing bladder symptoms in people with multiple sclerosis

Multiple sclerosis is a chronic disease of the central nervous system (brain and spinal cord). The cause is still unknown but there is evidence that suggests there is an autoimmune component to the disease that causes damage to the myelin sheath, a complex material that surrounds the axon of myelinated nerves (Fig 1). It affects 100–120 people per 100,000 population, approximately 75 per cent of whom will develop urinary symptoms (NICE, 2003). Bladder problems usually occur when the disease involves the spinal cord (Fig 2) and these can get worse as the disease progresses and the patient becomes less mobile. Bladder symptoms affect many aspects of daily life and their management is extremely important. As the disease progresses and symptoms worsen, a well-planned strategy can offer patients the most effective pathway to manage their bladder problems.

The bladder and multiple sclerosis The storage and voiding functions of the bladder require coordination of bladder and urethral sphincter activity. An intact central nervous system is needed to achieve this.

Patients with multiple sclerosis may present with urinary symptoms that are related either to the storage or voiding of urine. These include urinary urgency, increased daytime frequency, urge urinary incontinence, nocturnal enuresis, hesitancy, interrupted stream and incomplete bladder emptying (Box 1).

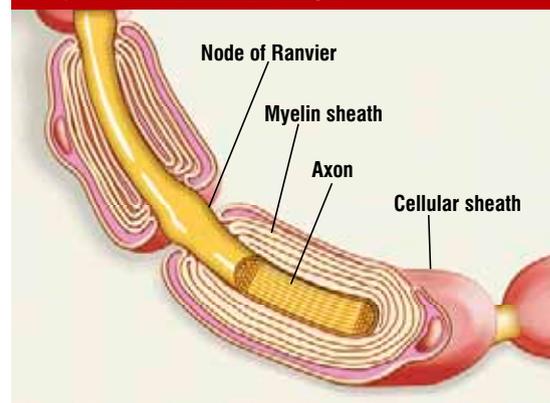
Betts et al (1993) identified that urinary urgency was the most common complaint made by patients. This results from an interruption of pathways between the brain and the spinal cord as a result of demyelination (loss of the myelin sheath) (Fig 1).

The most common bladder disorder experienced by patients with multiple sclerosis is neurogenic detrusor overactivity. This results from reflexes that cause contractions of the detrusor (muscle of the bladder wall) in an irregular, involuntary manner when only a small amount of urine is present in the bladder. The patient may have a sensation of urgency to micturate and if the bladder pressure exceeds that of the external urethral sphincter, urge incontinence (Box 1) may occur.

Interruption of the spinal pathways may also result in incomplete bladder emptying, owing to an inadequately sustained detrusor contraction or detrusor sphincter dyssynergia, or a combination of both.

Detrusor sphincter dyssynergia occurs when the external urethral sphincter contracts involuntarily at the same time as the detrusor, so that the patient presents with hesitancy of micturition, an interrupted stream and sometimes sensations of incomplete bladder emptying.

FIG 1. A MYELINATED AXON



Assessment and investigation The following steps should be part of any assessment and investigation:

- A bladder diary consisting of fluid intake and output should be completed. This should include space for fluid intake (amount and type), and frequent, urgent and incontinent episodes;
- A urine sample should be tested for nitrites and leucocytes and if the results are positive a specimen should be sent for microscopy, culture and sensitivity. Patients with multiple sclerosis may have an underlying urinary tract infection owing to their incomplete bladder emptying, which results in urinary frequency, urgency and/or incontinence. Infection can exacerbate existing neurogenic bladder symptoms;

BOX 1. TERMINOLOGY USED TO DESCRIBE LOWER URINARY TRACT FUNCTION

- **Urgency:** a sudden compelling desire to pass urine, which is difficult to defer
- **Urge urinary incontinence:** involuntary leakage accompanied by, or immediately preceded by, urgency
- **Increased daytime frequency:** the patient considers that she/he voids too often by day
- **Nocturia:** the patient has to wake one or more times at night to void
- **Nocturnal enuresis:** loss of urine during sleep
- **Intermittent stream (intermittency):** a urine flow that stops and starts on one or more occasions during micturition
- **Hesitancy:** difficulty in initiating micturition, resulting in delay in the onset of voiding after the individual is ready to pass urine

Source: Abrams et al, 2003

BOX 2. ANTICHOLINERGIC DRUGS FOR URINARY URGENCY, ENURESIS AND INCONTINENCE

- Oxybutynin 2.5mg–20mg daily
- Oxybutynin modified release 5mg–30mg daily
- Tolterodine 1mg–2mg twice daily
- Tolterodine modified release 4mg daily
- Trospium chloride 20mg twice daily
- Propiverine 15mg once to three times daily
- Solifenacin 5–10mg once a day

● The most important investigation on which to base any planned management strategies is the post-void residual volume of urine. This is the volume of urine in the patient's bladder immediately after micturition. Ideally, this should be measured using a bladder ultrasound scanner. Portable scanners enable patients to be scanned in their own homes. If a scanner is not available, the patient can void urine and an intermittent urethral catheter can then be inserted into the bladder to ascertain the post-void residual volume of urine;

● Other urodynamic studies, such as cystometry (assessment of bladder pressures) may be necessary if the patient has complex problems.

First-line management strategies

Practical advice Many patients with bladder symptoms, especially frequency, restrict their fluid intake. These patients should be advised to drink 1½–2 litres of fluid in 24 hours. Many patients benefit symptomatically from reducing their intake of caffeine.

The amount of fluids and type of diet can have a bearing on the frequency and type of bowel motions; some patients have noted that their bladder symptoms get worse if they become constipated.

Advice on voiding routine is sometimes necessary, as patients often go to the toilet when one is available rather than when they need to. This can make the symptoms of frequency worse as, by doing so, the bladder is not allowed to fill.

Medication

Neurogenic bladder overactivity: Patients with multiple sclerosis and neurogenic bladder overactivity usually respond well to oral anticholinergic drugs (Box 2). These reduce bladder contractions by blocking the action of acetylcholine (a neurotransmitter) on muscarinic receptors. The more common anticholinergic drugs such as oxybutynin and tolterodine are effective in the majority of patients. However, there are newer preparations, such

FIG 2. MRI SCAN OF DAMAGE TO THE SPINAL CORD IN A PATIENT WITH MULTIPLE SCLEROSIS



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as solifenacin, that could also be considered.

Modified-release preparations taken once a day are reported to be more effective, and are tolerated better because they have fewer side-effects; for example, a dry mouth. These preparations may not be suitable for all patients. Multiple sclerosis can present with relapses and remissions, particularly in the early stages and the ability to have a more flexible dosage of anticholinergic drugs can be an advantage (Box 2).

There is a possibility of an increase in the post-void residual volume of urine in the bladder while taking these drugs and it is necessary to repeat and review residual volumes regularly. In general, a residual of 100ml is considered significant. Management strategies to aid bladder emptying should be considered if this is exceeded (Fig 3).

Night-time frequency and nocturnal enuresis: Night-time frequency and nocturnal enuresis can be extremely frustrating and troublesome for both the patient and her/his partner or carer.

The use of desmopressin at night reduces urine output for six to eight hours. It should be used with care, as fluid overload is a side-effect. The drug should be avoided in those aged over 65. Several studies have shown that it

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can be used during the day to reduce urinary frequency on long journeys and for special occasions (Hoverd and Fowler, 1998).

Strategies for incomplete emptying

Voiding techniques Stimulation of trigger points such as tapping the abdomen, stroking the inner thigh, gentle pulling of the pubic hair, standing up and sitting down may precipitate voiding with some patients who have multiple sclerosis. In general, the Crede manoeuvre (abdominal pressure by hand) or the Valsalva manoeuvre (straining to urinate) should not be encouraged, although some patients carry out various versions of this (Fader and Graggs, 2003). Many patients with voiding problems develop their own methods, and experimentation can help to find the manoeuvre that will possibly assist with bladder emptying or hesitancy. However, this may not result in complete bladder emptying.

Aids for voiding There is little published data on the use of non-invasive aids to help with bladder emptying. Studies have shown that a hand-held vibrating device placed on the lower abdomen can help some patients to reduce their residual volumes of urine (DasGupta and Haslam, 1999; Prasad et al, 2003).

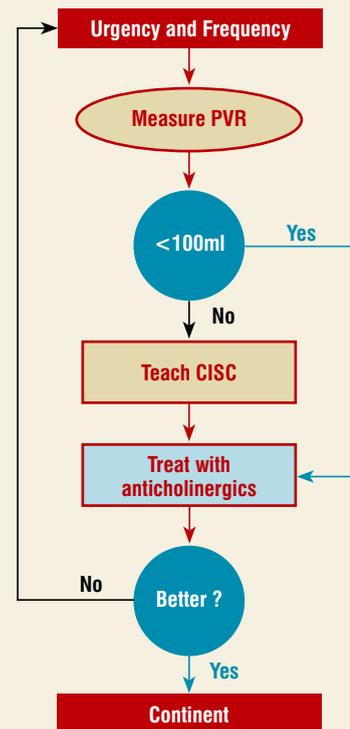
Pelvic floor exercises, electrical stimulation and biofeedback Guidelines from the National Institute for Clinical Excellence (2003) state that patients with multiple sclerosis who continue to have incontinence despite treatment ‘should be considered for a course of pelvic floor exercises preceded by a course of electrical stimulation of the pelvic floor muscles’.

Abrams et al (2003) described pelvic floor exercise training as ‘repetitive selective voluntary contraction and relaxation of specific pelvic floor muscles’ and electrical stimulation as ‘the application of electrical current to stimulate the pelvic viscera or their nerve supply’. NICE (2003) acknowledges, however, that not everyone will have access to such treatment.

Biofeedback is described by Abrams et al (2003) as ‘the technique by which information about a normally unconscious physiological process is presented to the individual and/or therapist as a visual, auditory or tactile signal’. Biofeedback increases awareness of how to use the pelvic floor muscles to postpone voiding and manage urinary urgency, and to aid bladder emptying by relaxation (McClurg et al, 2004).

Selection of the appropriate patients for these treatment options is important, as lack of motivation, poor cognition, and increased disability can affect

FIG 3. MANAGEMENT OF OVERACTIVE BLADDER: POST-VOID RESIDUAL GREATER THAN 100ML



Key: PVR – post-void residual urine
CISC – clean, intermittent self-catheterisation

patients with multiple sclerosis and will have a significant bearing on the success of this management strategy.

Intermittent catheterisation Patients with a post-void residual volume greater than 100ml and symptoms of overactivity and/or frequent urinary tract infections, may benefit from clean, intermittent self-catheterisation between one and five times a day (depending on the post-void residual volume and the patient’s symptoms).

The procedure should be taught to the patient by nurses who have experience in teaching the technique. If it is not explained fully, patient compliance may be poor. Most patients, including those with reduced mobility and dexterity, can be taught to self-catheterise. However, reduced cognition and motivation can be limiting factors.

Catheters for intermittent use are available in both male and female lengths, and with patience and understanding a suitable product can be found.

It is important that the patient is reassessed regularly,

as multiple sclerosis is a progressive disease with changing symptoms.

If patients are not able to carry out their own catheterisation, their partner/carer may be trained to undertake the procedure for them. This requires mutual understanding, and some thought should be given to the implications this may have on their relationship.

New treatments: second-line management strategies Patients with advanced disability may require an alternative management plan when none of the first-line strategies is effective.

Intravesical medication Various studies have looked at the effects of inserting drugs such as oxybutynin and atropine into the bladder (Glickman et al, 1995; Deaney et al, 1998). This route reduces the anticholinergic side-effects of these drugs that affect patient compliance. Intermittent catheterisation is necessary for instillation of the drug.

Intravesical vanilloids In the past, capsaicin was used to treat patients with intractable detrusor overactivity that was unresponsive to anticholinergic drugs. It increased bladder capacity and reduced overactivity. More recently, resiniferatoxin, a capsaicin analogue that is more potent and less irritant, was studied for use in controlling bladder overactivity. However, a pharmacological preparation of this agent is no longer available (DasGupta and Haslam, 1999).

Intradetrusor botulinum-A toxin Studies have shown that intra-detrusor injections of botulinum-A toxin are highly effective in treating the symptoms of detrusor overactivity (Reitz et al, 2004).

Studies involving patients with multiple sclerosis are showing that it is highly successful in reducing frequency, urgency and episodes of incontinence. It is not yet clear how botulinum-A toxin works in the bladder. However, at the International Continence Society meeting in Paris last year Apostolidis et al (2004) suggested that, in addition to the well known inhibition of the release of acetylcholine at the level of the detrusor muscle, botulinum-A toxin may also inhibit sensory receptors on the suburothelial nerve endings, which are thought to convey information with regard to the consciousness of bladder fullness status.

Cannabis-based extract Studies carried out using a medical cannabis extract showed that urinary urgency, incontinence, frequency and nocturia all reduced significantly following treatment (Brady et al, 2004). The

extract is taken sublingually and the dose is titrated by the patient to achieve the desired effect on bladder symptoms without psychotropic effects. Cannabis has not yet been licensed for medical use in the UK.

Long-term catheterisation If all management strategies fail and bladder symptom management has become increasingly troublesome for patients and/or their carer, an indwelling urinary catheter may be the best option. The choice for most patients is either urethral or suprapubic catheterisation, the latter being preferable for ease of changing, hygiene and comfort, especially for wheelchair-users and patients confined to bed. It is important to discuss all aspects of management and product ranges with the patient and carer. This will include catheter valves and types of bags and holders to ensure the correct choice is made.

Surgical management Only a few patients with multiple sclerosis will benefit from surgical intervention. Procedures such as cystoplasty or urinary diversion require careful consideration, and discussion with a urologist who appreciates the progressive nature of multiple sclerosis.

Conclusion There are many factors to consider when planning the management of bladder symptoms for people with multiple sclerosis. The disease is progressive and patients require ongoing assessment. It is the responsibility of nurses to offer a service that recognises this and responds to the varying and individual needs and expectations of each person. ■

POINTS FOR REFLECTION

When you have read this article consider the following points:

- Explain why patients with multiple sclerosis experience bladder symptoms;
- Explain the difference between nocturia and nocturnal enuresis.

Think about patients that you have nursed who have multiple sclerosis:

- Did they have bladder symptoms?
- How would you approach the topic of bladder problems with a patient?
- What investigations would you carry out as part of an assessment?
- Why is it important to assess the post-void residual urine volume regularly?
- What is the best method for assessing post-void residual volumes?