Managing multiple sclerosis and bladder dysfunction: part one

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Continence is an area that requires many community nurses to prescribe from the Nurse Practitioner’s Formulary to promote good patient care and appropriate service delivery. Recently in west Berkshire, with the full support of GPs, the continence advisory service has taken over the non-medical prescribing of all continence products, with the aim of providing a safe, cost-effective and timely service. This initiative is aimed at changing the way continence prescriptions are issued to patients. As well as examining the problems of bladder dysfunction in people with multiple sclerosis (MS), this first article of a two-part series, looks at the background to MS and bladder problems, as well as focusing on treatments such as clean intermittent self-catheterisation (CISC). The second part of the series will feature a case study looking at the management of a patient with MS and bladder dysfunction.

KEYWORDS:
Continence ■ Bladder problems ■ Multiple sclerosis ■ Prescribing

According to Compston and Coles (2008), 100,000 people in the UK are estimated to have multiple sclerosis (MS), which is a chronic neurological disorder and the most common cause of neurological disability in young adults. It is sometimes benign, frequently remitting, but often progressive, with gradually increasing disability. Although the nature of the disability will vary, the uncertainty and unpredictability is universal. For most, MS does not have a significant effect on life expectancy but it can mean facing 50 years of disability and poor quality of life.

BACKGROUND

MS was first described in the 1860s by the French neurologist Jean Martin-Charcot, however, for almost a century little research was carried out into the condition. Despite much research over recent years, the cause of MS is as yet unknown and a cure remains elusive (Multiple Sclerosis Trust, 2011). However, much can be done to manage the symptoms and, with the emergence of disease-modifying drugs, it is believed that increasing disability may be slowed (Multiple Sclerosis Trust, 2011).

Good management of MS is a huge challenge to health and social care services because the disease course is unpredictable and the symptoms endlessly variable, while the psychosocial consequences can be as profound as the physical symptoms. MS affects all aspects of life, work, social and family life and people with the condition continually have to readapt to changes in their condition and live with a lifetime of uncertainty. For this reason, a holistic approach, which places the individual with MS and their family at the centre of their own management, is essential.

Bladder problems, such as urinary urgency and frequency, are common in people with MS (Vahter et al, 2009), with studies frequently citing around 75% of people with the condition experiencing some kind of bladder issue (Marrie et al, 2007). These tend to occur as MS advances, appearing on average six years into the illness, although one in ten people may report symptoms at the time of initial onset (De Seze et al, 2007). This highlights the importance of community nurses raising bladder issues in routine assessments.

Multiple sclerosis

MS is the most common condition affecting the central nervous system (CNS), which is made up of the brain and spinal cord (Multiple Sclerosis Trust, 2011). It is generally diagnosed between the ages of 20 and 40, with women outnumbering men in a ratio of approximately 3:1 (Orton et al, 2006). Although MS can be diagnosed in very young children and in people over 65, this is unusual (Burgess et al, 2010).

Areas of low, medium and high prevalence of MS have been identified; it is commonest in temperate countries, decreasing with proximity to the equator (Richards et al, 2002), while in England and Wales, the prevalence is approximately 100–140 per 100,000 population (National Institute for Health and Care Excellence [NICE], 2003). This figure is higher still in Scotland, especially in Shetland and Orkney, where the highest known prevalence of 200 per 100,000 has been recorded (NICE, 2003).

According to the Multiple Sclerosis Trust (2011), the cause of MS remains unproven, but the evidence points toward a complex interplay of epigenetic, environmental and genetic factors that provoke the immune system to produce an autoimmune inflammatory response characterised by transient attacks on the cells that form myelin (the protective coating surrounding nerve fibres in the central nervous system). Over time, axonal loss (an axon is a projection from a nerve cell or neuron that conducts electrical impulses) and neurodegeneration leads
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The function of the bladder is to store urine until effective micturition is initiated in a socially acceptable time and place. An empty bladder sits low in the pelvis and is generally a triangular shape until it starts to fill and becomes more oval in appearance. The bladder is capable of distending to accommodate large volumes of urine, although it is accepted that in adults the normal filling capacity is achieved between 400 and 600mls before urination takes place.

The bladder itself consists of three layers:

- The outer layer: consists of connective tissue covered with a layer of peritoneum (serous membrane) and is highly vascular and innervated (having a dense supply of nerve endings)
- The middle layer: a mix of smooth muscle fibres and elastic tissue that are tightly intertwined into three layers known as the detrusor muscle. This layer enables the bladder to contract and expel urine
- The third and innermost layer: known as the mucosa, this layer is lined with transitional epithelium, which is capable of stretching as the bladder fills.

The mucosa is six or seven cells thick and is partly formed by umbrella cells that are in direct contact with urine. As the bladder empties, the walls contract into ripples or wrinkles, creating the potential for pockets of urine to be retained, which can lead to problems such as incomplete emptying, leakage, increased urge, and increased risk of infection among other issues. The mucosal layer is supported by the basement membrane, the lamina propria, muscularis mucosa and bladder muscle.

A triangle-shaped base of the bladder (the trigone), is found behind the symphysis pubis (a joint in the pubic bone) and is the least mobile part of the bladder’s structure, preventing stretching of the urethra or backflow of urine into the ureters. In males, the prostatic ligaments offer further stabilisation. The trigone contains three openings: two are the ureteric orifices are located on the posterior bladder wall and are the entry point for urine travelling down from the kidneys. Spiral smooth muscle fibres become elongated as the ureters approach the bladder and the Waldeyer’s sheath encases the lower ureter in fibromuscular tissue as it enters the bladder wall. The lowest bladder opening is the internal urethral orifice, which facilitates urine exiting the bladder and body. The trigone is less elastic than the mucosal lining and during filling, storage and emptying, undergoes relatively little movement.

Source: Holroyd (2016)

Susceptible person before puberty. This theory is supported by evidence that an individual living in the tropics is unlikely to develop MS, however, if they move to a more temperate environment before the age of puberty, they then become more vulnerable (Multiple Sclerosis Trust, 2011).

MS AND BLADDER DYSFUNCTION

Poor bladder control is disabling and many regard this as one of the most constraining aspects of MS (Nortvedt et al, 2001). Unpredictable urinary urgency with the potential for incontinence can cause a person to become housebound and unwilling to venture out, especially where access to toilets is uncertain. Although urinary urgency and frequency are the most common problems, many people with MS can experience difficulty in completely emptying their bladder. In some situations, such as before going out, they may find it difficult to pass urine even in the absence of urgency (this is reported by most patients with MS at the author’s clinic). They may have a reduced flow rate, an interrupted urine stream and/or the sensation of incomplete bladder emptying. It is important for community nurses to emphasise that much can be done to improve these symptoms.

Common bladder disorders

Bladder disorders that commonly occur in MS fall into two distinct types:

- Overactivity
- Incomplete emptying (Chancellor and Blaivas, 1994).

Bladder overactivity

Bladder overactivity is often the problem a person with MS is most aware of and results in a tendency for the bladder to contract unpredictably and sometimes uncontrollably, which leads to feelings of urge, frequency and urgency incontinence; at its worst, the bladder may seem to have ‘a life of its own’ (Multiple Sclerosis Trust, 2011).

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the spinal cord and controlling centres within the brain, particularly the micturition centre, which is situated at the base of the brain (Multiple Sclerosis Trust, 2011). In a spinal cord disease, this connection is disrupted, resulting in an overactive bladder, where after only partial filling, the bladder develops spontaneous contractions that provoke a sense of urinary urgency. Urinary incontinence occurs if the contraction pressure is too high for the muscles at the bladder outlet to resist.

Where disease affects the spinal cord (in the cervical cord area, a common site for demyelination in MS), neural impulses between the micturition centre and the nerves to the bladder will be interrupted, as will impulses between the brain and nerves to the legs. For this reason, difficulty with walking is usually associated with poor bladder control in MS and both problems can be the result of spinal cord disease (Betts et al, 1993). The effect of this means bladder control deteriorates at the same time as mobility worsens, making it increasingly difficult to respond to bladder urgency by getting to the toilet.

Another feature of the impaired nerve supply to the bladder muscle is that the normal capacity of the bladder is diminished, causing urinary frequency. In healthy individuals, the bladder has a capacity of between 300 and 500ml (approximately a pint of fluid), whereas the capacity in people with bladder problems due to MS may be reduced to 100ml or less. This increases the frequency of emptying from every three to five hours (depending on how much is drunk) to hourly or worse (Multiple Sclerosis Trust, 2011).

Incomplete emptying
Although some people with MS are aware that their bladders do not empty properly, others are not and for many, needing to urinate again soon after going to the toilet is an indicator that their bladder emptying is impeded (Multiple Sclerosis Trust, 2011). Research has shown that approximately half of people with MS who thought they were emptying their bladder completely were wrong and were surprised to find how much urine they had retained, resulting in feelings of hesitancy and retention (Betts et al, 1993).

According to the Multiple Sclerosis Trust (2011), incomplete bladder emptying is the result of two factors, both of which are due to spinal cord malfunction:

- The muscle which surrounds the bladder outlet tube (urethral sphincter) does not relax when the bladder muscle contracts, resulting in an interrupted flow
- The neural impulses that normally cause the bladder muscle to contract until the bladder is completely empty do not travel along the spinal cord. When the bladder does contract, the contractions, although frequent, are poorly sustained.

**MANAGEMENT**

The mainstay of treatment for bladder problems includes lifestyle advice, such as drinking adequately (30ml per kg for adults) and pelvic floor exercises, anticholinergic medication and clean intermittent self-catheterisation (CISC).

**CISC**

CISC involves the insertion of a small catheter into the bladder, which allows all of the urine to flow out before the catheter is then removed. The technique was pioneered by Lapides et al (1972) over 40 years ago, resulting in the single greatest improvement in the management of bladder problems in people with MS (Winder, 2002). CISC is recommended in the case of incomplete bladder emptying and can be repeated several times a day, while the technique has proven to be the most effective and practical means of facilitating bladder emptying (Moy and Wein, 2007).

CISC is indicated if there is a persistent post void residual volume in excess of 100ml (Fowlis et al, 2009), and must be initiated and taught by a urology specialist nurse or continence advisor. CISC will help to reduce the accumulation of urine in the bladder, which cannot be eliminated naturally. The procedure benefits people who have difficulty in voiding, as well as those who experience urinary frequency and urgency because their bladder is persistently almost full.

The recommended regimen is for patients to self-catherise two or three times a day and, if nocturnal frequency is problematic, last thing before bedtime (Multiple Sclerosis Trust, 2011). The patient will eventually become expert in how often they should carry out CISC, however, where patients find it necessary to perform the procedure up to 4–6 times in a 24-hour period, this may indicate that their bladder storage capacity is poor and antimuscarinic medications may need to be increased (Kalsi and Fowler, 2005).

A comprehensive systematic review of strategies to promote CISC in adults with neurogenic bladders (Adams et al, 2011), found the technique to be the ‘gold standard’ treatment in the management of neurogenic/neuropathic bladder disorders, providing independence and alleviating symptoms and complications of the urinary tract.

A UK consensus on the management of the bladder in MS (Fowlis et al, 2009) also considered CISC to be the most important treatment in the management of patients with neurogenic bladder dysfunction (NBD) caused by MS, although no formal evidence base for its use was found. Fowlis et al (2009) recommended CISC where there was a raised post-micturition residual volume of urine demonstrated either

**Practice point**

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by catheterisation or by ultrasound; the consensus further recommended that the technique be taught by specialist nurses.

A review of the literature on the use of CISC in people with MS found significant support and follow-up may be required to ensure long-term use of this technique (McClurg and Irshad, 2012). This review also found that there was little evidence in the literature for the physiological or social benefits of using CISC, the best technique and training methods, or the procedure’s benefit for the quality of life of people with MS.

However, it seems highly improbable that a placebo-controlled trial of CISC’s effectiveness will ever be undertaken, as the non-treatment of patients with a raised post micturition residual volume in a placebo arm would be considered unethical (Fowlis et al., 2009).

While CISC is considered the preferred way of emptying the bladder for people with MS, the condition’s multifaceted symptoms, which primarily follow a relapsing and remitting course but are ultimately progressive, mean that these patients are likely to have more complex issues affecting their training, adherence and follow-up needs compared with other groups using CISC (McClurg and Irshad, 2012). Therefore, further disease-specific research is needed on long-term use and adherence to CISC.

According to the Multiple Sclerosis Trust (2011), a lack of motivation is a common cause of failure to adhere to CISC, and there are also some medical conditions that make it impossible. Poor manual dexterity due to weakness or tremor is a major difficulty. A general benchmark is that people who can write and feed themselves are likely to have the necessary dexterity to self-catheterise. Lower limb spasticity or spasm may make thigh adduction (i.e. joint movement) difficult, but with appropriate management CISC may still be possible.

CONCLUSION

This article, the first in a two-part series on the management of urinary problems in people with MS, has looked at the background to the problem as well as the recommended treatments. The second article will look at practical application, including a case study of a patient with MS who was treated for bladder issues by the authors.

REFERENCES