Pelvic floor training for lower urinary tract dysfunction in MS

Does pelvic floor muscle training improve lower urinary tract function in MS?

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The aim of this study was to determine if pelvic floor muscle training (PFMT) improves lower urinary tract function in people with multiple sclerosis (MS). The authors found that a nine-week PFMT programme improved the function of the PFM, reduced the symptoms associated with lower urinary tract dysfunction and increased the quality of life in people with MS.

Lower urinary tract dysfunction can affect up to 84% of people with multiple sclerosis (MS). This may be due to dysfunction of the detrusor (bladder muscle), dysfunction of the urethral sphincter or a combination. Urine storage problems, leading to incontinence, may be associated with bladder-emptying problems and both must be considered at the same time.

Pelvic floor muscle training (PFMT) is defined as repetitive selective voluntary contraction and relaxation of specific PFMs (Abrams et al, 2002) and aims to make changes in functioning of the pelvic floor by improving the force, timing or coordination of the PFMs (Ba and Sherburn, 2005). PFMs are untrained in most people and appropriate training programme should produce a change in PFM function or force, even in the presence of tissue pathology such as neuropathy associated with MS (Ba and Sherburn, 2005).

In patients with detrusor overactivity, there is experimental evidence that contraction of the PFMs and urethral sphincter can have an inhibitory effect on the detrusor (De Groat et al, 2001). This is thought to occur because PFM contraction results in an increase in the pressure stopping urine from leaking, which reduces the pressure in the bladder leading to a reduction or cessation in the sensation of urgency.

A review of the literature regarding the use of PFMT in people with neurogenic disease produced few high-quality research articles. However, one study reported possible benefits in patients who had suffered a stroke (Tibaek et al, 2004) and two small studies reported possible benefits in people with MS (Fried et al, 1995; Klarskov et al, 1994).

Several studies reported some benefits following the use of PFMT and electrical stimulation (De Ridder et al, 1999; Vahtera et al, 1997; Primus and Kramer, 1996; Primus, 1992). More recently, a report from the Third International Consultation on Incontinence (Wyndaele et al, 2005) concluded that behavioural techniques that incorporate PFM exercises to control urgency appear to be beneficial for most neurological patients, but there was no consensus on the technique that should be used or the population that could benefit from such interventions.

The objective of this study was to assess if it was possible to improve PFM function in people with MS, and to report associated improvements in bladder dysfunction and quality of life.

Methodology

Participants were over 18 years and had a diagnosis of multiple sclerosis that was stable for the previous three months. They were all able to reach the toilet independently. They had to have sufficient dexterity to complete the assessments and treatment protocol. Participants were included if they presented with at least one of the following:

- Involuntary leakage of urine;
- Passing urine more than eight times in 24 hours (Stöhrer et al, 1999);
- Nocturia and/or reported voiding dysfunction such as hesitancy, straining, poor stream and incomplete emptying, demonstrated by uroflowmetry (measures the volume of urine and speed and time taken to pass urine).

Participants were excluded if they had suffered a relapse of MS requiring an inpatient stay three months prior to or during the study.
REFERENCES


Other exclusions included: symptomatic pelvic organ prolapse; previous or current treatment for prostatic hyperplasia; urinary tract infection; current or recent diagnosis of a serious medical condition (other than MS); and severe cognitive impairment.

Recruitment was by self-referral in response to advertising via MS charities and hospital outpatient departments. Treatment was conducted in 12 healthcare facilities throughout Northern Ireland. Ethical approval was granted.

All participants (n=37; 11 men, 26 women) were provided with both written and verbal information about the trial and gave written informed consent. Thirty-six participants completed the study.

Procedures
The intervention period was for nine weeks, with participants attending clinic once a week and performing PFM exercises daily at home.

At week one, PFM function was assessed during a vaginal/anal assessment and graded according to the modified Oxford scale (Laycock and Jerwood, 2001). Electromyography (EMG) biofeedback was also performed. During subsequent weekly visits to clinic, EMG biofeedback was undertaken again.

Based on the initial vaginal/anal assessment, participants were instructed to perform daily PFM exercises at home and were provided with a written regimen and a record card to record concordance.

The exercise regimen was reviewed weekly. A typical programme commenced with a holding time of three seconds with five seconds’ rest; this was repeated five times and done five times a day. This could be gradually increased according to the feedback to holding submaximally for 10 seconds with a five-second rest, repeated five times, five times a day.

Outcome measures
Outcome measures were recorded by an independent researcher at the initial assessment and then at nine, 16 and 24 weeks and included:

- Digital assessment of the strength and endurance by the Modified Oxford Scale (Laycock and Jerwood, 2001);
- EMG biofeedback, which measures muscle contraction and can provide an overview of the relaxation and contraction phases of PFM activity (Haslam, 2002);
- Symptomatic relief was measured using a three-day bladder diary which recorded the number of leakage episodes (Schafer et al, 2002), a 24-hour pad test (Siltberg et al, 1997) and uroflowmetry with measurement of post-void residual urine in the bladder;
- Patient perspective and quality of life were measured using the international prostate symptom score (Barry et al, 1992) and a visual analogue score relating to bothersomeness.

Results
Digital assessment
The initial digital assessment of PFMs demonstrated that seven women could not perform a PFM contraction; all men (n=11) could.

At baseline, the average grade was 1 on the modified Oxford Scale (a very weak contraction) and an average endurance was two seconds. Following EMG biofeedback, the results showed that five people were still unable to voluntarily contract their PFM. However, there was an average increase of one grade in the strength of the PFM (modified Oxford Scale) and an increase in endurance of 4.5 seconds. These increases were both statistically significant and were maintained at follow-up. Those unable to contract their PFMs stayed in the study.

There was a slight non-significant improvement in the contraction phase of the EMG biofeedback, which was maintained throughout the study.

Endurance was also measured. At the end of the treatment phase, a significant increase in endurance was demonstrated which was maintained at follow-up.

Bladder diary
The number of episodes of urine leakage recorded in the three-day bladder diary was reduced by 47% and this significant improvement was maintained at follow-up.

After the nine-week intervention period, participants reported an 18% reduction in frequency from nine to seven voids and a 53% reduction in night voids which was maintained at follow-up.

24-hour pad test
Results for the pad test demonstrated a 41% reduction in urine leakage at the end of the treatment period which was again largely maintained throughout the study.

Uroflowmetry
By week nine, uroflowmetry results demonstrated an improvement in bladder emptying. Non-significant improvements in maximum flow rate
Discussion
The aim of this paper was to determine if it is beneficial to patients with MS and who have bladder dysfunction to undertake a course of PFMT. To our knowledge this has not been definitively established in previous studies.

The function of the PFM has been shown to be impaired in MS (De Ridder et al, 1999; De Ridder et al, 1998; Jameson et al, 1994) and this impairment is suspected to be an important factor in urinary and faecal problems in this population (De Ridder et al, 1998).

At the beginning of the study, nearly all participants had a weakness in the contraction of PFM together with poor endurance and the muscles were quickly exhausted. It was also apparent that those with severe leakage had poorer contraction strength and endurance.

The results demonstrated that the function of PFMs of people with MS can be improved with an appropriate training programme.

Bø and Sherburn (2005) found that, even in the presence of tissue pathology such as neuropathy, if there is no change in PFM function after a PFMT programme, the training programme is likely to have been insufficient or the participants failed to adhere to it.

In this study, the strength and endurance of the PFMs, as measured by vaginal/anal palpation, improved significantly. Fried et al (1995) also reported a statistically significant association between increased PFM contraction duration and a reduction in incontinence episodes in patients with neurogenic problems.

Incontinent episodes and pad test weight were both reduced by over 40% following the nine weeks of intensive training; furthermore these reductions were maintained at six months. Frequency and nocturia were also reduced significantly and, interestingly, there also seemed to be an improvement in voiding ability, with a significant reduction in the post-void residues of urine in the bladder.

From initial assessments, it was evident that male and female patients had slightly different symptoms. Men tended to have less leakage, similar frequency and urgency but more voiding dysfunction than women. Following the treatment period, there was an improvement in these symptoms as demonstrated by the results of the uroflowmetry. This improvement in bladder emptying may be due to several factors such as a better relaxation of the PFM, improved voiding position and the use of the double void technique (urinating, then waiting a few minutes and going again).

From anecdotal reports from participants and the significant reduction in the score of the international prostate symptom score and the visual analogue score, it was evident that the decrease in symptoms resulted in a better quality of life.

Conclusion
Fifty per cent of people with MS will develop bladder dysfunction within three to five years of diagnosis (Nortvedt et al, 2007) and PFMT may help to reduce symptoms. It would seem practicable to include some form of PFMT as standard in a rehabilitative programme and, if necessary, direct referral to a specialist continence physiotherapist should be offered. This is likely to have a positive impact on people’s quality of life.

KEY POINTS
- Fifty per cent of people with multiple sclerosis develop bladder dysfunction within three to five years of diagnosis
- Pelvic floor muscle exercises may help to reduce symptoms
- Pelvic floor muscle training should be included in rehabilitation programmes
- Patients may benefit from a direct referral to continence physiotherapists

and post-void residual urine in the bladder were noted. There was a significant improvement in the volume of urine voided. These improvements in voiding were maintained at follow-up.

Quality of life and patients’ perspectives
At the end of treatment there was a statistically significant reduction in international prostate symptom score, indicating an improved quality of life, which was maintained at the end of the study period.

Participants also reported a reduction in bothersomeness of bladder dysfunction throughout the study.

REFERENCES


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