

The Relationship of Pelvic Floor Muscle Activity with Urinary Incontinence, Physical Activity Levels, Fatigue and Quality of Life in Patients with Multiple Sclerosis: Preliminary Results of a Cross-Sectional Study

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AIM

To investigate the relationship between pelvic floor muscle (PFM) activity assessed by surface electromyography (sEMG) and urinary incontinence severity, disability, quality of life, and fatigue in women with Multiple Sclerosis (MS).

METHODS

Design



Preliminary cross-sectional study.

Participants



n = 17
female patients with MS

Age

30–50 years
(mean: 44.88 ± 11.48)

BMI

24.20 ± 3.37
kg/m²

EDSS

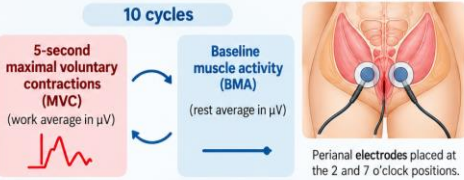
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EMG Assessment



Biofeedback-assisted surface electromyography (sEMG).
(NeuroTrac Myoplus, Verity Medical Ltd, UK).

Measurement Protocol



Clinical Outcomes

- Expanded Disability Status Scale (EDSS)
- Neurogenic Bladder Symptom Score (NBSS)
- International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF)
- Incontinence Impact Questionnaire-7 (IIQ-7)
- International Physical Activity Questionnaire (IPAQ)
- Fatigue Severity Scale (FSS)



Statistical Analysis



Pearson's correlation coefficients

RESULTS

Correlation of EMG Parameters with Clinical Measures

Mean MVC and MVC-BMA Difference (µV)

Clinical Measure	Mean MVC r (p)	MVC-BMA Difference r (p)
EDSS	-0.281 (0.275)	0.956 (<0.001) ★
FSS	-0.699 (0.002) ★	-0.622 (0.008) ★
IPAQ	0.713 (0.001) ★	0.702 (0.002) ★
ICIQ-SF	-0.898 (<0.001) ★	-0.873 (<0.001) ★
IIQ-7	-0.859 (<0.001) ★	-0.808 (<0.001) ★
NBSS Total	-0.914 (<0.001) ★	-0.858 (<0.001) ★
NBSS QoL	-0.840 (<0.001) ★	-0.834 (<0.001) ★

★ p < 0.05 (significant correlation)

Mean BMA (µV)

Clinical Measure	Mean BMA r (p)
EDSS	0.115 (0.661)
FSS	-0.238 (0.358)
IPAQ	0.011 (0.965)
ICIQ-SF	-0.057 (0.827)
IIQ-7	-0.144 (0.582)
NBSS Total	-0.159 (0.542)
NBSS QoL	0.008 (0.976)

INTERPRETATION

- While MVC represents maximal contraction and BMA resting muscle activity, the MVC–BMA difference may better reflect the PFM's ability to increase activation above baseline.
- Its consistent associations with clinical symptoms and disease severity suggest that net voluntary activation may be a more sensitive indicator of pelvic floor dysfunction in MS.

CONCLUSION

These preliminary findings highlight the need for further studies to confirm the relationship between PFM activation and clinical outcomes in MS.

Ethics approval and informed consent obtained • Declaration of Helsinki followed