

The Short-Term Effect of Functional Magnetic Stimulation on Symptoms of Refractory Neuropathic Overactive Bladder Syndrome in Women

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Hypothesis / aims of study

Functional magnetic stimulation (FMS) has been approved as a conservative treatment method for overactive bladder syndrome (OAB) by the FDA in 1998 [1]. Since then, several studies have tried to evaluate the effect of this kind of treatment. Some suggest that FMS improves OAB symptoms in the short- and medium-term, while others could not confirm its efficacy [1-3]. Our aim was to evaluate the short-term effect of FMS on bothersome lower urinary tract symptoms refractory neuropathic OAB, which can be a consequence of nerve entrapment by disc protrusion, spinal stenosis or neural foramina narrowing. In our experience, these patients are especially difficult to treat, as the first- and second-line conservative therapy often does not result in improvement of their condition.

Study design, materials and methods

- prospective study
 - **Inclusion criteria:** patients with OAB and coexisting chronic degenerative lumbar spine disease in whom conservative therapy did not relieve the symptoms
 - **Contraindications:** pregnancy, active UTI, implanted pacemaker or cardioverter defibrillator
 - **Patient work-up:**
 - urogynaecological history and examination
 - IIQ-7, UDI-6, PPIUS, I-QOL, and bladder diary before and 1 month after FMS
 - **FMS:** magnetic chair, 16 FMS courses in 2 months (2-3 courses per week)
- Descriptive statistics were used to describe basic patients' characteristics. Non-parametric paired samples test was used to compare results before and after FMS. Statistical significance was set at $p < 0.05$.

Results

- N = 12/13 (1 patient excluded because of UTI)
- average age 63 ± 15 years (range 23-75 years)
- ten patients (83.3%) were menopausal
- ten patients (83.3%) were taking an anticholinergic or beta-agonist before and during FMS

Table 1: Comparison of number of daytime and night-time voids, number of pads used per day, PPIUS score, and urgency bother score before and after FMS.

Variable	Before FMS	After FMS	p-value
Daytime frequency [No \pm SD, range]	8.2 \pm 3.4 (3.5-13)	5.9 \pm 3.1 (1.5-11)	0.007
Nocturia [No \pm SD, range]	5.2 \pm 5.5 (2-20)	2.7 \pm 2.7 (0-9)	0.005
Number of pads used per day [No \pm SD, range]	2.5 \pm 2.8 (0-8)	2.1 \pm 2.2 (0-6)	0.197
PPIUS [value \pm SD, range]	3.2 \pm 0.7 (2-4)	2.5 \pm 0.9 (1-3,5)	0.016
Urgency bother score [values \pm SD, range]	68.7 \pm 15.6 (44-90)	52.7 \pm 26.4 (5-80)	0.008

Table 2: Comparison of UDI-6, IIQ-7, I-QOL Avoidance, Psychosocial Impact, Embarrassment, and Total scores before and after FMS.

Variable [value \pm SD, range]	Before FMS	After FMS	p-value
UDI-6	75.4 \pm 24.7 (25-100)	34 \pm 19.5 (0-62.5)	0.004
IIQ-7	65.5 \pm 33.5 (0-95.1)	15.8 \pm 16.9 (0-52.4)	0.004
I-QOL Avoidance	18.3 \pm 9.2 (9-35)	22.8 \pm 8.6 (12-38)	0.059
I-QOL Psychosocial Impact	20.9 \pm 9.7 (9-39)	26 \pm 11.1 (14-44)	0.075
I-QOL Embarrassment	12.8 \pm 5.4 (7-24)	14.5 \pm 5.7 (9-25)	0.245
I-QOL Total	51.9 \pm 23.6 (28-98)	63.3 \pm 24.3 (38-106)	0.054

Conclusions

According to our results, FMS significantly decreases the number of daytime frequency and nocturia in women with refractory neuropathic OAB. FMS also significantly improved PPIUS, urgency bother, UDI-6, and IIQ-7 scores, but the difference in I-QOL scores was not statistically significant. It seems that FMS has some positive short-term effect on LUTS in the group of patients, which we often find most difficult to treat. The therapy was well accepted by patients. Some of them experienced lower back or back thigh pain during stimulation, but the pain was only transient and subsided after the stimulation. In the future, it would be necessary to determine the duration of these positive effects and evaluate whether these patients would benefit from repetitive FMS courses.

Take-home message

FMS significantly improves bothersome LUTS in women, who suffer from refractory neuropathic OAB, and decreases the daytime frequency and nocturia in the short term.

Disclosures: The magnetic chair was lent to us for the time of the study by Iskra Medical company.

References:

- 1 Lim R, Lee SW, Tan PY, Liong ML, Yuen KH. Efficacy of electromagnetic therapy for urinary incontinence: A systematic review. *Neurourol Urodyn* 2015; 34:713-22.
- 2 Yamanishi T, Homma Y, Nishizawa O, Yasuda K, Yokoyama O; SMN-X Study Group. Multicenter, randomized, sham-controlled study on the efficacy of magnetic stimulation for women with urgency urinary incontinence. *Int J Urol* 2014; 21:395-400.
- 3 Morris AR, O'Sullivan R, Dunkley P, Moore KH. Extracorporeal magnetic stimulation is of limited clinical benefit to women with idiopathic detrusor overactivity: a randomized sham controlled trial. *Eur Urol* 2007; 52:876-81.