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Title: SHORT-TERM INTRAVAGINAL MAXIMAL ELECTRICAL STIMULATION FOR THE TREATMENT OF REFRACTIVE DETRUSOR INSTABILITY

Aims of Study:

Maximal electrical stimulation (MES) for lower urinary tract dysfunction has been used for years, however few studies have evaluated its effect on detrusor instability (DI) (1,2). Moreover, because of the lack of good evidences due to used heterogeneous stimulation parameters such as amplitude, duration and frequency of pulses, no firm conclusion could be drawn on the effect of MES on DI from these studies (1-3). This prospective clinical trial was undertaken to determine the safety and objective and subjective efficacy of intravaginal MES for the treatment of refractive DI.

Methods:

A total of 35 consecutive patients with pure detrusor instability, in whom other conservative treatments including bladder drill and pharmacotherapy failed were enrolled in the study. After hospitalisation of the patients, MES was performed by using a software-driven electrostimulation device and a vaginal probe (Liberty System) for 30 minutes with a duty cycle of 5 seconds of stimulation and 5 seconds of rest, twice daily for 7 days under the control of a resident. A fixed frequency of 12.5 Hz was used and the current amount was adjusted to the highest tolerable level in 5mA increments from 5mA to 100mA.

All of the patients were evaluated subjectively by patients questionnaires and daily urinary dairy and objectively by 1-hour pad test and subtracted cystometry before and one week after the treatment. Improvement was defined as a >50% decrease in incontinence episodes Per day, fluid loss Per hour or peak detrusor pressures in cystometry. Cure defined as no incontinence episode, <2 gr./hour fluid loss or no involuntary detrusor contraction obtained by cystometry. Paired-t, and Chi Square test were used for the statistical analysis of the obtained data.

Results; All of 35 patients with a mean age of 56.5±10.2 years (35-80 years) and parity of 3.4±1.2 (1-6) completed the study. The results of the objective and subjective evaluation methods, obtained before and after the MES were presented in table I. After the treatment, subjective variables including mean number of voids, nocturia, urgency and urge incontinence Per day were observed to be decreased significantly ($p<0.01$). Among the objective variables it was found that the mean number of pads used Per day, urine leakage Per hour determined 1-hour pad test, detrusor pressure at maximum capacity were decreased, while maximum bladder capacity and postvoiding residual urine volume increased significantly ($p<0.01$). Urinary diaries showed 16 (45.7%) patients were cured and 15 (42.9%) were improved. Pad test and subtracted cystometry showed that 12 (34.3%) and 8 (22.9%) patients were cured and 16 (45.7%) and 18 (51.4%) patients were improved, respectively. There were no significant adverse effects related to the treatment, except vaginal irritation noted by 5 patients.

Variables	Before Treatment (mean ± SD)	After Treatment (mean ± SD)
Voids (No./day)	12.8 ± 2.5	6.8 ± 1.2
Nocturia (No./day)	3.2 ± 1.1	1.2 ± 0.8
Urgency (No./day)	6.3 ± 1.6	1.3 ± 0.6
Urge incontinence(No./day)	5.1 ± 1.2	0.9 ± 0.3
Pads used (No./day)	3.5 ± 0.8	0.5 ± 0.3
Leakage (gm/hour)	39.2 ± 7.4	9.9 ± 3.8
Maximum cystometric capacity (ml)	243.8 ± 32.7	385.4 ± 38.6
Detrusor pressure at maximum capacity (cm H_2O)	19.8 ± 4.7	8.6 ± 2.8
Postvoiding residual urine (ml)	12.5 ± 3.2	27.1 ± 11.2

Table I: The data obtained from patients questionnaires, urinary diary, pad test and subtracted cystometry before and after the maximal electrical stimulation therapy.

Conclusion: The results of this clinical trial suggested that MES, by suppressing involuntary detrusor contraction and increasing bladder capacity, could offer a safe, non-invasive and effective treatment for patients with DI who respond poorly to other conservative therapies.

References:

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