

THERAPEUTIC OUTCOMES OF FUNCTIONAL CONTINUOUS MAGNETIC STIMULATION (FCMS) COMBINED WITH PELVIC FLOOR MUSCLE EXERCISE(PFME) IN URINARY INCONTINENCE

Aims of Study

To evaluate the combination of FCMS with PFME(anal training) in urinary incontinence from the standpoint of urodynamic findings, pad test and patient diary records.

Methods

Patients, who visited our institute for urge incontinence or stress incontinence in the five-year period from 1998 to 2002 and agreed with the content of the study in written form, were instructed in PFME and to record patient diary. A total of 58 patients, who had urinary incontinence once or more a week, underwent urodynamic study (UDS). 31 patients had overactive bladder (OAB), urge incontinence and detrusor overactivity(DO) (urge incontinence group) and 27 had stress incontinence but not DO(stress incontinence group). These two groups of patients were randomly assigned either to sham-treatment (sham group) or to active treatment (active group), respectively. Of 27 patients with stress incontinence, 13 patients age:62±14.1 years ;13 female and 0 male received the active treatment and 14 patients(age: 52±12.5 years ;14 females and 0 male), the sham treatment. Of 31 patients with urge incontinence, 16 patients age: 62±18 years 9 females and 7 males received the active treatment and 15 patients (age: 68±14 years 11 females 4 males), the sham treatment.

Sham group underwent magnetic stimulation-free treatment once a week for 10 weeks and were instructed to practice PFME everyday. The active group underwent functional continuous magnetic stimulation (FCMS treatment) once a week for 10 weeks: the patients with urge incontinence were treated with magnetic stimulation at 10Hz for 20 minutes and the patients with stress incontinence, at 50Hz for 20 minutes. The patients on the active treatment were also instructed to do PFME every day. Therapeutic outcomes were evaluated after 10 weeks of treatment. In the urge incontinence group, the post-treatment UDS findings (bladder capacity at first desire to void (FD) and that at strong desire to void (SD)) were compared with the initial ones. In the stress incontinence group, therapeutic outcomes were evaluated by comparing the post-treatment UDS finding (leak point pressure: LPP) with the initial one and the post-treatment pad test data with the initial ones. The patients were instructed to record the number of leaks in the patient diary. The reduction in the number of leaks by 50% or more after treatment was defined as 50%- improvement.

Wilcoxon signed rank test, Mann-Whitney U test and Fisher's exact test were used for statistic analysis of data. P values less than 0.05 were regarded as statistically significant levels.

Results

In urge incontinence, bladder capacity at both FD and SD significantly increased after the active treatment (table 1). DO disappeared in 3 of 16 patients on the active treatment and in 1 of 15 on the sham treatment. LPP was evaluated in 11 patients with stress incontinence and it increased by 42.4 cmH₂O after the active treatment, whereas it did not change after the sham treatment (table 2). 60 minute pad test could be performed in 12 patients both before and after treatment. The results are summarized in table 3. The numbers of leaks, recorded in patient diary for 3 days previous to the initiation of treatment and for 3 days after treatment, were summed. As a result, the number of leaks was significantly improved in stress incontinence patients on the active treatment, as compared with those on the sham treatment (table 4). With regard to 50%-improvement, there was a significant difference between the active treatment and the sham treatment in urge incontinence, whereas no significant difference was noted between the two treatments in stress incontinence (table 5).

Table 1 UDS findings in urge incontinence

	treatment	Before treatment mean±SD(ml)	After treatment mean±SD(ml)	Wilcoxon signed rank test
Bladder capacity at FD	Active(n=16) Sham(n=15)	152±79 142±25	199±70 175±78	p=0.0032 p=0.1348
Bladder capacity at SD	Active(n=16) Sham(n=15)	223±101 218±49	300±128 243±118	p=0.0015 p=0.5320

Table 2 LPP(leak point pressure) in stress incontinence

treatment	Before treatment mean±SD (cmH ₂ O)	After treatment mean±SD (cmH ₂ O)	LPP deference (cmH ₂ O)	Mann-Whitney U test
Active (n=5)	93.4±30.8	135.8±23.1	42.4	p=0.0173
Sham (n=6)	107.0±27.8	107.0±25.6	0	

Table3 Results of pad test in stress incontinence

Treatment	Before treatment mean±SD (g)	After treatment mean±SD (g)	Wilcoxon signed rank test
Active(n=8)	15.4±20.4	10.0±17.4	p=0.4606
Sham(n=4)	14.7±18.8	10.5±8.9	p=0.8750

Table 4 numbers of leaks (3 - day sums)

group	treatment	Before treatment mean±SD	After treatment mean±SD	Wilcoxon Signed rank test
Urge incontinence	Active (n=14)	7.3±9.9	6.9±13.7	p=0.6848 p=0.4648
	Sham (n=12)	5.9±5.8	4.9±6.2	
Stress incontinence	Active (n=8)	12.0±18.3	6.6±14.8	p=0.0234 p=0.5781
	Sham (n=8)	14.1±18.2	12.8±16.2	

Table 5 50%-improvement rate

Urge incontinence	Active(n=14) Sham(n=12)	71.4% 33.3%	p=0.0182*
Stress incontinence	Active(n=8) Sham(n=8)	75.0% 50.0%	p=0.3042*

*Fisher's exact test

Conclusions

Combination of FCMS plus PFME resulted in a remarkable improvement of UDS parameters (bladder capacity at FD and SD) in urge incontinence and in an improvement of LPP in stress incontinence. With regard to the numbers of leaks, there was a significant intragroup difference in stress incontinence on the active treatment, but not in urge incontinence on the active or sham treatment. With regard to 50%-improvement rate, there was a significant difference between the active and sham treatments in urge incontinence, but not in stress incontinence, indicating that PFME itself may play a more therapeutic role in stress incontinence.

References

1) T. Yamanishi, K. Yasuda, S. Suda, et al : Effect of functional continuous magnetic stimulation for urinary incontinence. J Urol. 163:456,2000