

INTERFERENTIAL THERAPY VS. PELVIC FLOOR EXERCISES FOR THE TREATMENT OF STRESS URINARY INCONTINENCE IN WOMEN

ALI SOLIMAN HASSAN AND O. HASSAN*

Rheumatology & Rehabilitation and Urology Departments, ,
Zagazig University Faculty of Medicine*

KEY WORDS: *INTERFERENTIAL THERAPY, PELVIC FLOOR EXERCISES, STRESS INCONTINENCE.*

ABSTRACT

Objective: *To compare and evaluate interferential therapy and pelvic floor exercises for treatment of stress incontinence in women.*

Methodology: *Forty female patients with stress urinary incontinence were randomized to treatment with either interferential therapy (group I) or pelvic-floor exercises (group II) Patients were assessed with subjective response, provocation test and urethral pressure profile.*

Results: *The subjective improvement or cure rates were 60% in group I and 75% in group II. According to the provocation test, 55% of the patients in group I and 65% of the patients in group II were either cured or improved. The maximum urethral closure pressure was significantly increased after treatment in both groups.*

Conclusion: *Interferential therapy and pelvic floor exercises are both effective means of treatment of stress incontinence in women.*

INTRODUCTION

Urinary incontinence is a significant cause of disability and dependency among the elderly. The prevalence of urinary incontinence in the elderly living in the community in the United states is estimated to be as high as 30% (*Herzog & Fultz, 1990*).

Patients currently have few treatment choices for stress urinary incontinence.

Surgery is effective for the treatment of stress incontinence but is not without risks (*Santon, 1990*). There is, therefore, a place for conservative management, and physiotherapy has long been an option, particularly for women who have not completed their childbearing and for those with mild symptoms.

Physiotherapeutic treatment consists of training the patient to recognize, perform, and practice voluntary contraction of the muscles of the pelvic floor (*Harrison, 1973*). The purpose is to build up the muscle strength and bulk to support urethral closure especially in stress situations (*Mantle & Versi, 1991*).

Restoration of urinary continence is possible after electrical stimulation of different modalities (*Fal, 1984; Mantle & Versi, 1991 and Sand et al., 1995*). The most popular and successful form of such treatment is interferential therapy, where two slightly different, medium frequency alternating currents interact at the level of the pelvic floor to produce a low frequency therapeutic current (*Olah et al., 1990*).

Aim of Work:

The aim of the present study was to compare and evaluate interferential therapy and pelvic floor exercises for the treatment of stress urinary incontinence in women.

PATIENTS AND METHODS

This study included 40 female patients with stress urinary incontinence, attending the Outpatient Clinic of the Rheumatology and Rehabilitation Department, Zagazig University Hospital. Their ages ranged from 20 to 75 years with a mean age of 44.36 years. The patients were referred from the Departments of Gynecology and Urology for pelvic floor reeducation.

Diagnosis of stress incontinence was established based on typical history of the disease, direct visualization of urine leakage during coughing and normal cystometric findings. Patients suspected of having concomitant urge incontinence and those who had undergone a previous gynecological or neurological operations for correction of stress incontinence were excluded.

All patients were subjected to the following:

- Detailed history taking.

- Thorough clinical examination.
- Urine analysis and culture.
- Urodynamic studies (*Wein et al., 1988*) using Dantec Menuet DK-2240 apparatus, Denmark.
- Uroflowmetry.
- Cystometry to exclude bladder over activity (*bladder instability*).
- Urethral pressure profile (*Profiler*).

Patients were divided into 2 groups according to the line of treatment they received:

Group I: Included 20 patient who received interferential therapy, 3 sessions per week for 4 weeks, using Endomed M-433 apparatus, *Enraf-Nonuis, Holland*. Treatment was given with the patient in a semi-recumbent position with the hips and knees flexed. Four large electrodes were used, two placed on the abdomen and two placed on the inside of the thighs. An interferential current of between 0 and 100 Hz was used, the intensity depending on the maximum that the patient could comfortably tolerate Each treatment was given for 15 minutes. The frequency, duration and position of the interferential current were similar to those used by *Olah et al. (1990)*.

Group II: Included 20 patients who received pelvic floor exercises (*PFE*) program, 3 sessions per week for 4 weeks in the hospital. In addition, they were instructed to practice the exercise program 6 to 8 times per day at home. The PFE program was done according to *Hahn et al. (1991)*.

The two treatment groups were well matched for age, weight, parity duration of symptoms; clinic and urodynamic findings (table 1).

At the end of the course of treatment, all patients were subjected to:

Subjective evaluation: The patients assessed the results of treatment as worse unchanged, improved or cured (*Olah et al., 1990*).

Provocation test (*Hah et al., 1993*): The patient was not permitted to void for 1 to 2 hours prior to the start of the test, which was performed whilst standing on a sheet of paper. The test comprised the following.

- Coughing vigorously 5 times.
- Jumping on the spot with the feet together for 30 seconds.

- Jumping on the spot with the feet alternatively together and apart for 30 seconds.

Leakage was estimated as 0 = no leakage; 1 = slight leakage, a few drops of urine; 2 = moderate leakage during approximately half of the test; 3 = severe leakage during the whole test.

Urethra pressure profile studies.

RESULTS

The clinical features and urodynamic findings of the patients (groups I and II) before treatment are presented in table (1).

Table (1): Clinical and urodynamic findings of the patients before treatment.

	Group I (Mean \pm SD)	Group II (Mean \pm SD)
1- Age (years)	43.6 \pm 12.53	42.9 \pm 11.59
2- Body weigh (kg)	76.5 \pm 8.81	79.85 \pm 9.57
3- Parity (No.)	4.8 \pm 2.47	5.14 \pm 3.24
4- Duration of symptoms (years)	6.48 \pm 2.92	6.97 \pm 3.24
5- Provocation test (grade)	2.14 \pm 0.85	1.9 \pm 0.65
6- Maximum urine flow rate (ml/sec)	20.05 \pm 2.93	18.95 \pm 2.37
7- Maximum cystometric capacity (ml)	416.3 \pm 56.08	398.85 \pm 53.69
8- Maximum detruser pressure during cystometry (cm water).	3.05 \pm 2.98	2.8 \pm 2.65
9- Maximum urethral closure pressure (cm water)	35.7 \pm 6.74	33.6 \pm 6.3

The subjective response to treatment is outlined in table (2). After interferential therapy, 25% of the patients in group I considered themselves to be cured, 35% had improved and 40% were unchanged. In group II, 30% of the patients after PFE program were cured, 45% had improved and 25% were unchanged.

According to provocation test, 25% of the patients in group I were cured, 30% had improved and 45% were unchanged. In group II, 30% of the patients were changed. This is shown in table (3).

Table (2): Patients subjective evaluation of the results of treatment.

	Group I		Group I	
	No.	%	No.	&
Cured	5	25%	6	30%
Improved	7	35%	9	45%
Unchanged	8	40%	5	25%
worse	0	0%	0	0%

Table (3): Evaluation of the results of treatment by provocation test.

	Group I		Group I	
	No.	%	No.	&
Cured	5	25%	6	30%
Improved	6	30%	7	35%
Unchanged	9	45%	7	35%
worse	0	0%	0	0%

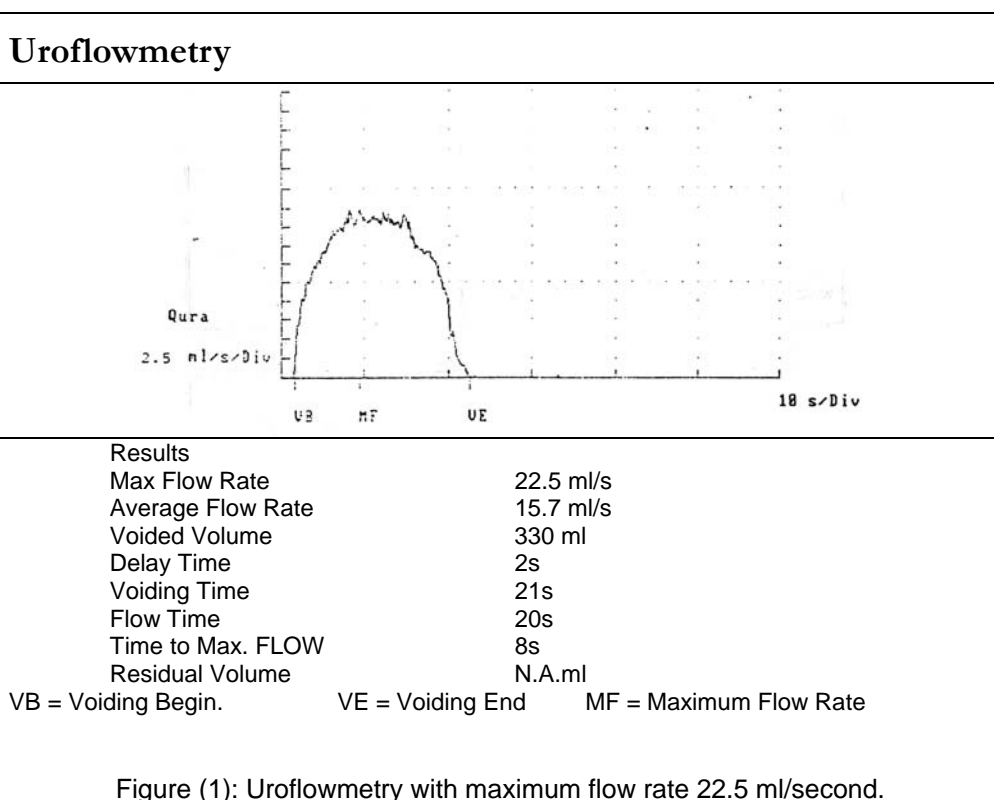
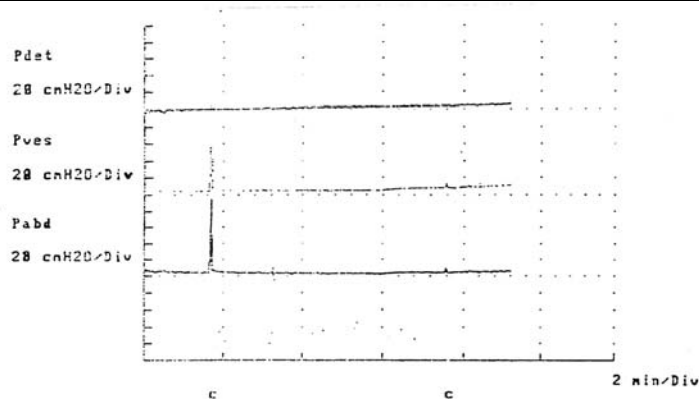


Table (4): Evaluation of the result of treatment by the maximum closure pressure.

	Before treatment	After treatment	p value
Group I	35.7 ± 6.74	46.53 ± 7.09	< 0.01
Group II	33.6 ± 6.3	43.15 ± 8.41	< 0.01

As regards the maximum urethral closure pressure, it was increased significantly after treatment in both groups ($p < 0.01$) (table 4 and Figs. 3&4).

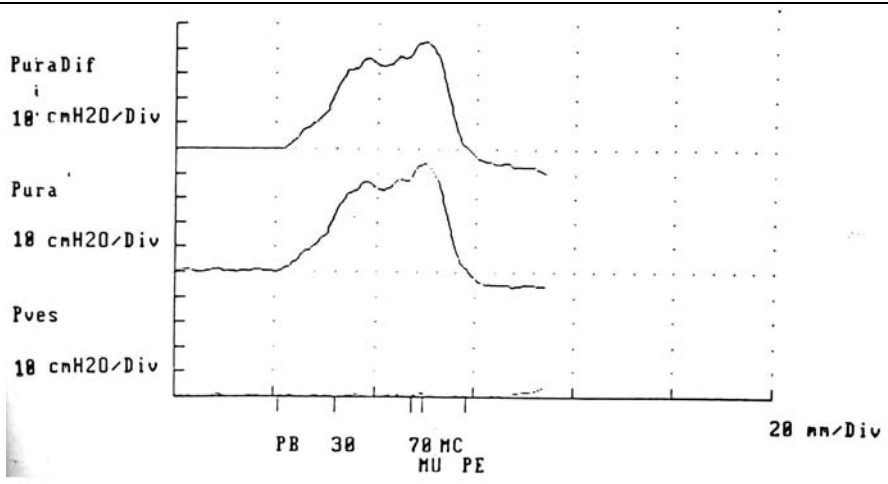
Water Cystometry



RESULTS (Storage phase)	Vinfus	Pdet	Compliance
Residual Volume	N.A. ml		
First Desire to void	326 ml	3 cm H2O	
Normal Desire to void	439 ml	4cm H2O	81.4 ml/cm H2O
Strong Desire to void	N.A ml	N.A. cm H2O	N.A. ml/ cm H2O
Urgency	N.A ml	N.A. cm H2O	N.A ml/cm H2O
Max Cystometric Capacity	462 ml	5 cm H2O	24.1 ml/cmH2O
TECHNIQUE	supine		
Position of Patient	Transurethral	catheter	
Filling by	open Catheter		
Catheter	continuous		
Type of Fluid	saline		
Infusion Rate	50 ml/min	Medium	
Electrode	None		
Pabd = Abdominal Pressure.	Pves = Vesical Pressure		
Pdet = Detrusor Pressure.	C = cough		
Vinfus = Infusion Volume.			

Fig. (2): Normal cystometry with maximum detrusor pressure 5 cm H₂O at maximum capacity 462 ml.

Urethral Pressure Measurement



<p>RESULTS Max Urethral Pressure Max Closure pressure Functional Length Length of Continence Zone Continence Area</p>	<p>Cm H2O Cm H2O mm mm mm cm H2O</p>	
<p>TECHNIQUE Position of Patient Catheter Infusion Rate Withdrawal ate Bladder Volume Electrode</p>	<p>supine open Catheter 2 ml/min 2.0 mm/s N.A.ml None</p>	<p>31 30.5 43 25 1013</p>
<p>Pves = Vesical Pressure PuraDif = Urethral Closure pressure. PE = Profile End MC = Maximum Closure Pressure.</p>	<p>Pura = Urethral Pressure. PB = Profile Begin. MU = Maximum Urethral pressure</p>	

Figure (3): Profilometry with maximum urethral closure 30.5 cm H₂O before treatment.

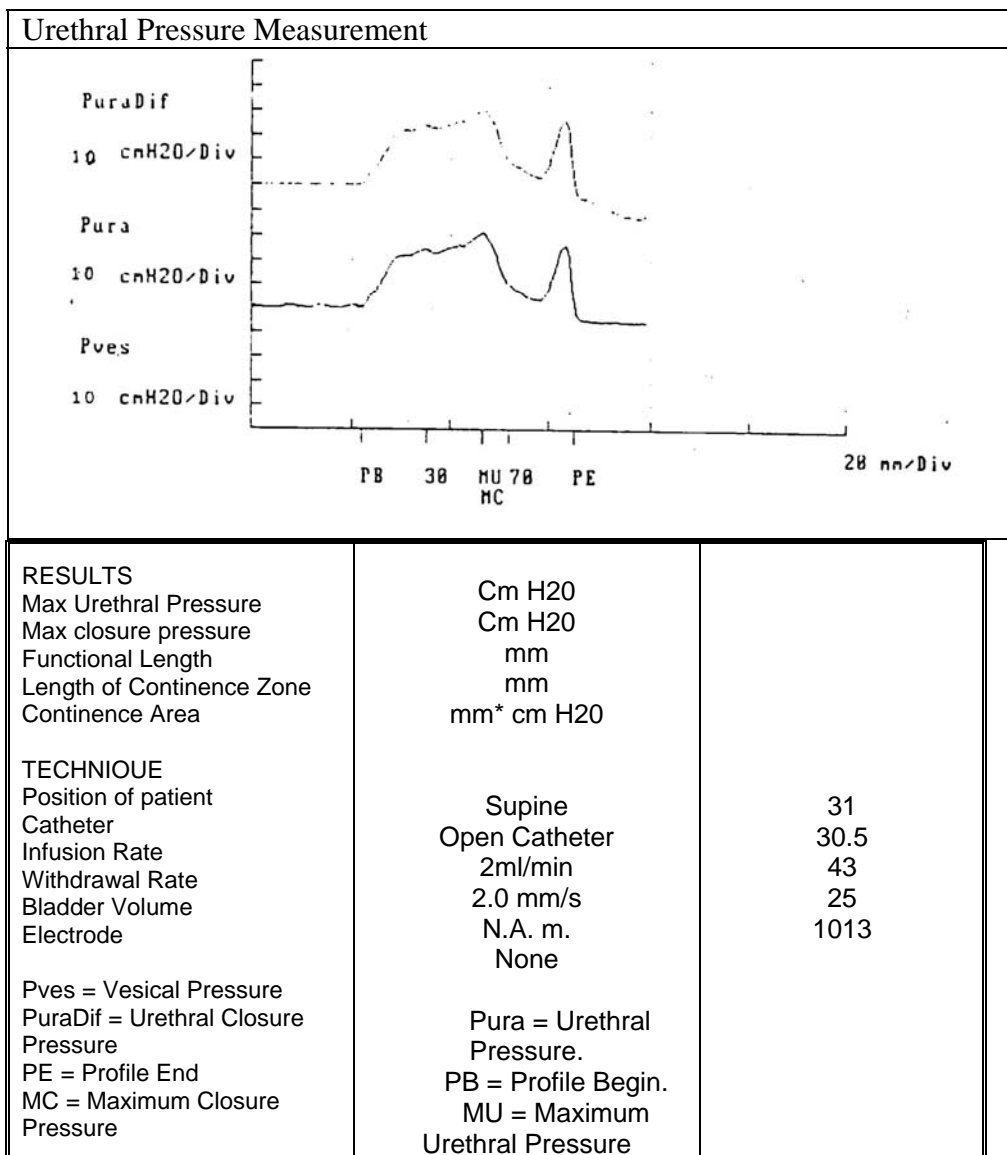


Fig. (4): Profilometry with maximum urethral closure pressure 43 cm H₂O of the same patient after treatment.

DISCUSSION

Electro-stimulation of the pelvic floor is widely used in the management of female urinary incontinence. The feeling of contracting the muscles of the pelvic floor is a useful reminder to the patient of the sensation that should be perceived, and they are encouraged to try to contract the pelvic floor muscles during treatment (*Olah et al., 1990*). Interferential therapy used alone has been shown to be an effective treatment in patients with stress incontinence (*Laycock and Green, 1988*) and is a useful adjunct to pelvic floor exercises.

In the present study, interferential therapy cured or improved 60% according to the patient's subjective assessments. These results are consistent with those who reported cure or improvement following interferential therapy. However, *Dougall (1985)* reported 36% cure rate with interferential therapy alone, and *Olah et al., (1990)* found that 90% of patients were improved or cured following interferential therapy combined with pelvic floor exercises.

Several reports confirmed the effect of pelvic floor exercises (*PFE*) on female urinary incontinence. The PFE program in this study cured or improved 75% according to the patient's subjective assessments. Our results are comparable to those reported by *Hahn et al., (1993)* who found that 71% of patients were cured or improved following PFE, and to those of *Henalla et al., (1988)*, who reported that 67% of patients were cured or their condition improved. In addition, *Wilson et al., (1987)* found 66% cured immediately after a hospital exercise program.

Similar results are reported by *Mantle and Versi (1991)*. A 192 English centers was surveyed and the general impression of the report was that the most effective treatment for stress incontinence was pelvic floor exercise in 74% of the cases, with interferential therapy being rated as 63% effective.

The patient's subjective report of improvement is crucial in clinical practice, but from a scientific standpoint it is an unreliable measurement. In the present study the results of treatment were also assessed objectively using a provocation test and urethral pressure profile. Provocation test demonstrated that 55% of patient under PFE program were either cured or improved. Also maximum urethral closure pressure was significantly increased after treatment in both groups.

Conclusion:

In conclusion, both interferential therapy and pelvic floor exercises are effective treatment for stress urinary incontinence in women, and since no side effects have been observed, these conservative approaches are recommended before surgery is considered.

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