Research Article

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Behavioral training in the treatment of urinary incontinence post-prostatectomy.

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Urinary incontinence post-prostatectomy is a common, disruptive and potentially disabling condition in which the subject complains of involuntary leakage of urine. This study was performed in order to detect the effectiveness of behavioral training in the treatment of urinary incontinence post prostatectomy. In addition, urodynamic and cystometric measures as important parameters in these subjects. In this prospective, randomized, controlled study, forty male patients with moderate intensity of urinary incontinence were included. Urinary bladder compliance, detrusor stability and bladder volume at maximum cystometric capacity were assessed by urodynamic machine. All of the parameters were evaluated before and after 36 sessions from the beginning of the treatment. Twenty cases underwent behavioral training and interferential current therapy, while only interferential current therapy was applied in the remaining twenty cases. Behavioral training included habit changes for managing symptoms and promoting bladder health as well as Training techniques for managing symptoms .Detrusor stability and bladder compliance showed non significant difference after the treatment while, the bladder volume at maximum cystometric capacity showed a significant difference in both groups at the end of the study. Physical therapy modalities used in this study are applied easily and non invasive. It can be concluded that behavioral training can be used effectively in patients with urinary incontinence in combination with interferential current therapy.

Key words: urinary incontinence; behavioral training; urodynamics.

Urinary incontinence (UI) is defined as the complaint of involuntary leakage of urine. Prevalence and risk factors depend on baseline physiological mechanisms, including weakness of pelvic floor muscles, hyperactive bladder that may result in urge UI, poor urethral sphincter function associated with stress UI, and impaired structural and functional integrity of pudendal nerve activity, associated with Pelvic floor muscle weakness plays an important role in UI etiology (Mattiasson, 2001). Pelvic floor muscles work to support the bladder neck in the intra-abdominal cavity and maintain urinary continence. Weakness of these muscles leads the bladder to shift to the extra-abdominal cavity and thus a change in the urethra-vesicle angle occurs. The result of intra abdominal pressure changes is to open the bladder neck rather than to close it ,thus causing urinary incontinence when intra-abdominal pressure is increased (Herman ,1988).pelvic floor muscles(PFM) exercise aims to control periurethral muscles to occlude the urethra during physical activity, while bladder training aims to extend the interval between voluntary voiding . Both exercises are known to be effective in treating stress and urge incontinence (Burgio, 2004). Investigators indicated that urinary incontinence is significantly improved by behavioral interventions, but most patients were not completely dry. Nevertheless the majority of patients were satisfied with the clinical progress achieved after behavioral intervention. For this reason, many

investigators have re-evaluated the definitions of success after behavioral intervention, and the findings of those studies suggest that a patient's perspective of quality of life and well-being should be used as measures of intervention outcome. Another consideration is that most behavioral intervention programs for urinary incontinence are provided by physicians in clinical settings, and therefore, are limited by a lack of provider availability and times. From the literature reviews, we noticed that many of related studies had following methodological weaknesses; 1) having no control group 2) not providing any intervention upon the control group even if there was the control group, thus threatening the study validity (Diokno et al. 2004), and 3) providing the treatments merely once or within short-term. Therefore, it was recognized that further complementary studies were needed to confirm the effectiveness of behavioral programs. The specific purposes were to evaluate: 1) the effectiveness of this program on urinary incontinence symptoms, and urodynamic measures such as compliance and stability of the bladder in addition to the bladder volume at maximum cystometric capacity. The effectiveness of this program on psycho-social well-being of patients and the proportion of subjects who continued self-training after terminating the program, and whether outcome variables were improved at follow-up assessment compared to the test conducted immediately after program termination through the urodynamics.

MATERIALS AND METHODS

This prospective randomized and controlled study, which aimed to compare the results of different physiotherapy techniques in patients with UI, was conducted in the National Institute of Urology and Nephrology in Cairo. The cases were diagnosed as urinary incontinence by an urologist and referred to the physical therapy department, between January and October 2010. Diagnosis was made according to the detailed history, clinical and physical examinations and using DANTIC UD 5000/5500 Urodynamic investigation system. Those patients with urinary tract infections, diabetes mellitus, neurological diseases, cognitive problems and neoplasm were excluded (Hahn et al.1991)**.** Patients were randomly assigned into behavioral training with interferential current(IC) and IC groups, according to the application order. Age, height, weight and body mass index values were recorded as physical characteristics. Duration of the incontinence problem was determined. Smoking habit and alcohol consumption, presence of constipation, chronic coughing, allergy, heart disease, blood pressure problems and diuretic drug usage were recorded because of their possible effects on urinary incontinence. DANTIC UD 5000/5500 Urodynamic investigation system was used to perform the urodynamic investigation. Measurements were done by the staff of the urodynamic unit in the National Institute of Urology and Nephrology. All patients were subjected to multichannel cystometry, before starting the study to measure bladder compliance, detrusor stability, in addition to the bladder volume at maximum cystometric capacity. All subjects asked to evacuate their bladder before starting the treatment sessions to ensure that they are relaxed and comfortable during the session .Two electrodes of interferential current are placed symmetrically on the abdomen above the inguinal ligament, 3 cm apart .Two electrodes are placed on the inside of the thighs below the inferior border of the femoral triangle. The procedure was repeated every other day for 36 sessions. Behavioral therapy was implemented in 12 visits approximately one week apart. The first visit consisted of an explanation of continence-Related anatomy and pelvic floor muscle exercises, followed by teaching using anal palpation. Participants were instructed in pelvic floor muscle contraction without breath holding or contraction of abdominal, thigh, or buttock muscles. Home exercises included 3 daily sessions from lying, sitting, and standing with 15 repetitions of a 2- to 10- second contraction followed by an equal period of relaxation depending on the participant's demonstrated ability. The contraction and relaxation duration was advanced by 1 second each week to a maximum of 10 to 20 seconds. Participants were instructed to practice interruption or slowing of the urinary stream during voiding once daily for the first 2weeks (Filocamo et al. 2005).Participant kept daily bladder diaries and exercise logs during the 12 weeks of treatment. Participants received a fluid management handout defining normal intake, which consisted of drinking 6 to 8 eight fluid- ounce glasses daily, and advising participants to avoid caffeine and distribute fluid consumption throughout the

day. At the second visit, participants were taught bladder control strategies. The strategy for preventing stress incontinence was to contract pelvic floor muscles just before and during activities that caused leakage, such as coughing or lifting. The urge control strategy involved instructions that :no rush to the toilet but instead to say still and contract the pelvic floor muscles repeatedly until urgency abated and then proceed to the bathroom at a normal pace (Klutke et al.2009). In subsequent visits bladder control strategies discussed in detail to improve results and adherence. The second group included twenty subjects, who received interferential current for 15 minutes per session extended to 30 minutes for a total of 36 sessions, the same manner as the first group. All of the cases were re-evaluated after the treatment protocol. Patients were also observed for possible adverse effects of the methods such as allergic skin reactions, erythema, inflammation and pain.

RESULTS

Demographic and other baseline data: Table (1) represents a summary of patients demographic data and clinical characteristics at the beginning of the study as age, and body mass index (BMI).

Urodynamic measures*:* It was observed that there were no statistical significant differences in bladder compliance and detrusor stability after 36 sessions of treatment in the behavioral training with interferential current group comparing it to the interferential current group ($p>0.05$) while, there were a significant statistical difference in bladder volume at maximum cystometric capacity when comparing between post treatment results of both groups ($p<0.05$). But there were statestical significant differences when comparing the results before and after the treatment protocol in bladder volume at maximum cystometric capacity of both groups while the bladder compliance and detrusor stability showed statistical significant differences before and after the treatment protocol for the behavioral training group but there were non significant differences in results of bladder compliance and detrusor stability for the interferential current therapy group as shown in tables (2 and 3) and demonstrated in figures (1 ,2 and 3).

DISCUSSION

Treatment with the lowest risk should be recommended first in the dealing with urinary incontinence although behavioral training are associated with low risk, they can unfortunately be perceived as being time consuming and too difficult to implement, especially when bladder symptoms become severe before they are recognized(Sampselle, 2000). Routine questioning of patients about voiding patterns would allow for symptoms to be recognized at an early point when information about healthy bladder habits could be optimally provided by the clinician. High priority conditions such as urinary tract infections, diabetes, obesity and hypertension should be avoided (Robert and Ross, 2006)**.** Scheduling a specific office visit every week to discuss bladder health issues and having the patient bring in a completed bladder training program would be an effective strategy in addressing any issues that might have been raised in each week. The key point is that the physiotherapist tries to invest the time educating patients about their condition and counsels them about strategies to manage their problems. It is important to keep in mind that treatment for other conditions and concomitant medical conditions may contribute to urinary incontinence symptoms, especially in older persons. Therefore, before adding another medication, it is important to ensure that an existing medication(s) is not contributing to the patient's symptoms (Payne, 2000). If so, this should be taken into account when setting a behavioral training strategy. In selecting the type of therapy to be used for the treatment of urinary incontinence, it is of paramount that clinicians gauge the patient's treatment preferences, motivations, expectations and goals. The decision to begin behavioral training before or with medications is driven by clinician and patient preference. Patients presenting with urinary incontinence symptoms should be taught skills for responding adaptively to urgency of urination, including relaxation tools, distraction techniques, pelvic floor muscles contractions and staying away from the bathroom until the urgency has subsided rather than rushing to the toilet. Bladder training or timed voiding can be especially helpful for patients whose symptoms include frequent urination (Mattiasson et al.2003) .For the patient, the success of a lifestyle modification or behavioral training process, may depend on receiving adequate support from their caregivers. Physiotherapists should follow-up

Table 1: The bio data of all patients included in the study

Parameter		Behavioural training and IC group (study group)	IC group (Control group)
Age (year)	Mean ± SD	55.750± 11.769	52.700± 9.782
	SE	2.632	2.187
	Range	40 – 70	40 – 70
BODY MASS INDEX (BMI)kg/m^2	Mean ± SD	27.830± 3.139	26.680±3.393
	SE	0.7019	0.7588
	Range	21- 32.2	19.8-31.7

Table 2: Comparing pre and post treatment mean values of all measured variables within each group.

Variable	Group	Mean ± SD		p-value
		Pre	Post	
Bladder volume at maximum cystometric capacity	study	342.59± 54.145	408.08± 64.122	0.0001 **
	control	327.23± 49.945	360.41± 61.406	0.0001 **
Bladder compliance	study	1.400± 0.5026	1.800± 0.4104	0.0078**
	control	1.450± 0.5104	1.550± 0.5104	0.5000
Detrusor Stability	study	1.400± 0.5026	1.800± 0.4104	0.0282**
	control	1.500± 0.5130	1.700± 0.4702	0.2749

**: Level of significance

Table 3: Comparing pre and post treatment mean values of all measured variables between both groups.

Variable	Time of evaluation	Mean ± SD		p-value
		study group	control group	
Bladder volume at maximum cystometric capacity	Pre	342.59±54.145	327.23±49.945	0.3570
	Post	408.08±64.122	360.41±61.406	0.0213**
Bladder compliance	Pre	1.400±0.5026	1.450±0.5104	0.7932
	Post	1.800± 0.4104	1.550±0.5100	0.1714
Detrusor stability	Pre	1.400±0.5026	1.500± 0.5130	0.5908
	Post	1.800± 0.4104	1.700±0.4702	0.5866

**: Level of significance

Figure 1. Bladder volume at maximum cystometric capacity pre and post treatment in both study and control groups.

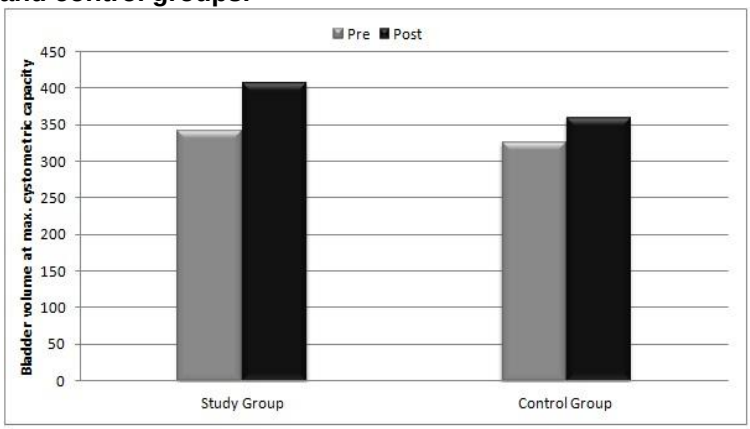


Figure 2. Bladder compliance pre and post treatment in both study and control groups.

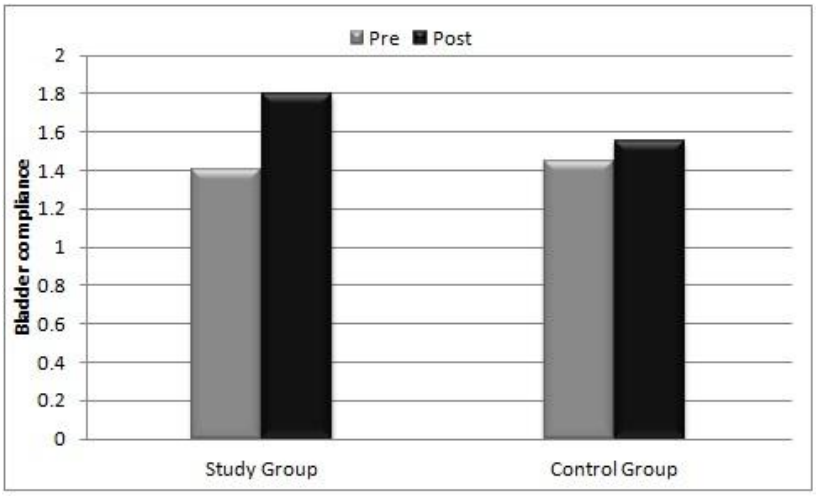
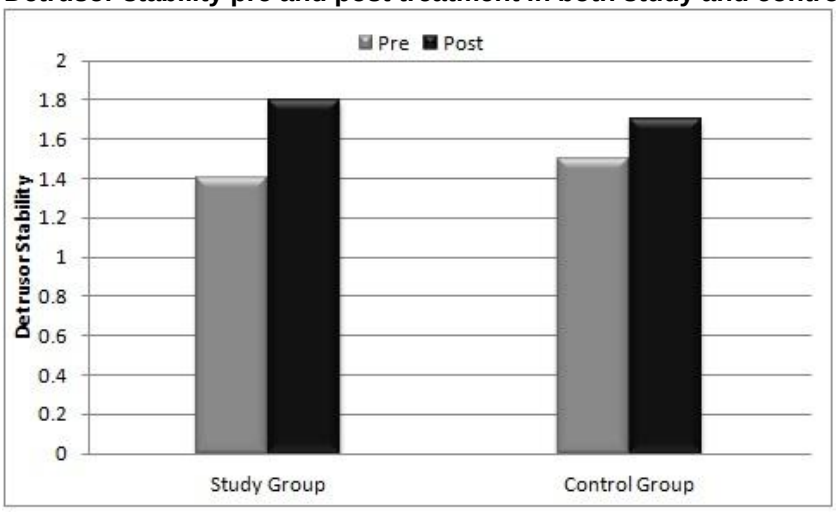


Figure 3. Detrusor stability pre and post treatment in both study and control groups.



with patients regularly to monitor their progress and determine whether the treatment protocol is effective to the patient, or whether modifications need to be implemented. If the patient is not responding well to these first-line therapies, they can be referred to a continence specialist for evaluation and treatment .Urodynamic evaluation was indicated for those patients to measure the bladder compliance, detrusor stability and bladder volume at maximum cystometric capacity. Pelvic floor electrical stimulation involves the application of interferential current to the PFMs to induce a contraction of these muscles and a decrease in the uninhibited detrusor contractions associated with urinary incontinence (Bae et al. 2003). The findings of this study reveal that both behavioral training and interferential current procedures are of benefit in patients with UI, in regard to improvement in intensity of incontinence .Urinary bladder compliance and detrusor stability show non significant success, however the increased percentage of improvement .In addition, the bladder volume at maximum cystometric capacity shows significant improvement. In the literature, studies on the conservative treatment of UI include methods such as pelvic floor exercises, electrical stimulation, bladder training and biofeedback. Behavioral training can be applied alone or can be

combined with other procedures in UI treatment. (Pfister, 1999) compared the effects of pelvic floor exercises and BF in 40 women with USI and found that voiding frequency and the subjective complaints of the cases improved in both groups after four weeks of treatment followed by two weeks with a home program. They indicated that the improvement in voiding frequency was more evident in cases that performed pelvic floor exercises whereas the increase in the pelvic floor muscle strength and reduction of subjective complaints were more evident in BF group**.** (Berghmans et al. 2000) investigated the effects of pelvic floor exercises with and without BF application in 44 patients of USI. They have pointed out that the combined approach was more effective than performing pelvic floor exercise alone. There are a limited number of studies on the use of IC in urinary incontinence treatment. The use of IC in patients with UI is the study of (Turkan et al. 2005), they presented the results of a physical therapy program consisting of the use of IC and Kegel exercises in patients with different intensities of urodynamic incontinence, but not in comparison with other treatment modalities. They indicated that the program was more effective in cases with mild and moderate incontinence intensity rather than in those with severe incontinence. These methods can be used in clinical practice as they are non invasive, easily applied and well tolerated. Although statistical analyses revealed that behavioral training and IC seemed to cause similar amount of improvement in the measured variables, results of studies including a greater number of subjects are needed to ascertain any clinically useful differences between the two methods. As the follow-up period of all cases is not completed, it is planned to present the long term results of these treatments in a further study. Subjects who successfully perform a home program will be compared with those who fail to sustain the exercise program.

Conclusion

Behavioral training can readily be incorporated into the daily lives of patients who possess the cognitive and functional capability; physiotherapists can readily incorporate these therapies into routine medical care. Although urinary incontinence symptoms can be successfully managed using non-pharmacological approaches, they require considerable motivation from the patient and attrition rates may be high without adequate follow up, although attrition may also occur because of lack of efficacy. Behavioral training which educate and empower patients can be utilized either alone or as an adjunct therapy to gain improvement of urinary incontinence. Finally, physiotherapists should be familiar with the practical details of habit changes and training techniques not only to optimize treatment outcomes in consideration of patient preferences and goals for urinary incontinence treatment, but also as the foundation for patient education to promote bladder health as part of routine healthcare.

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