



Hypothesis / aims of study

The literature points out that the application of biofeedback therapy is helpful, and can also effectively reduce stress and anxiety in patients with Interstitial Cystitis/Bladder Pain Syndrome (IC/BPS). The study is to investigate the effect of autonomic biofeedback combined with pelvic floor biofeedback in patients IC/BPS, with regard to the clinical symptom index (ICSI), clinical problem index (ICPI), and the improvement of depression and anxiety.

Materials and methods

In this study, 28 patients with IC/BPS underwent cystodilation, and were given 4 times of pelvic floor muscle relaxation training and 3 times autonomic biofeedback intervention. Changes in symptoms and emotional symptoms were analyzed by generalized estimating equations (GEE) to compare whether there were significant differences before and after intervention.

RESULTS & INTERPRETATION

RESULTS

- (1) Improvement of ICSI and ICPI, PUF, GRA
ICSI and ICPI scores after six weeks of treatment were significantly reduced respectively. Compared with the baseline value, ICSI and ICPI had an improvement effect but not significant after three months of treatment. The PUF score were reduced after two weeks, four weeks and six weeks of treatment respectively. However, the improvement effect was not significant after 3 months. The GRA had a significant improvement only after six weeks of treatment (Table 1).
- (2) Analysis of ICSI-2, revealed that: after six weeks, a significant reduction of more than 1 point was achieved, but after three months, there was no significant difference. The ICPI-1, achieved a significant reduction after two, four and six weeks of continuous treatment intervention. The improvement effect was not significantly different after three months. (Table 2)

INTERPRETATION

- (1) Improvement of ICSI and ICPI:
The ICSI ICPI revealed significant improvement after 6 weeks, but no improvement post 3 months treatment implicit the intervention were effective in the short period, not in long period. Whether the result was due to the autonomic or pelvic biofeedback should be further clarified..
- (2) Improvement of urinary tract symptoms:
The PUF score showed improvement in short time period (6 weeks), but not in the long period (3 months) mean the biofeedback may be only effective in the short term period. Both VAS pain and urgency were improved after 6 weeks of continuous intervention, but not after three months, may be the only short time effective.
- (3) Improvement of anxiety and depression symptoms:
The BDI was the only clinical index that could maintain significant improvement for three months in this study showed that combined autonomic and pelvic biofeedback should be the core-strategy of treatment in term of depression.
- (4) The sub-score of ICSI, ICPI revealed only ICSI-2, ICPI-1 have significant improvement. The underlying reason could not be clarified from our study.

Experimental Paradigm

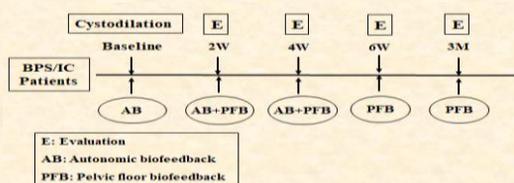


Table 1. The p values and effect sizes (β) compared with the first visit after two-weeks-treatment-program by using a GEE model

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Measure	Post-2 weeks		Post-4 weeks		Post-6 weeks		Post-3 months	
	β (95% CI)	p value						
ICSI	-3.70(-5.60,-1.80)	<0.001*	-1.56(-3.43,0.31)	0.102	-3.74(-5.61,-1.87)	<0.001*	-1.11(-3.79,1.57)	0.416
ICPI	-1.29(-3.07,0.49)	0.156	-1.86(-3.67,-0.05)	0.044*	-4.54(-6.26,-2.82)	<0.001*	-0.60(-4.39,3.19)	0.757
PUF	-5.96(-8.01,-3.94)	<0.001*	-2.94(-4.94,-0.93)	0.004*	-6.59(-8.60,-4.58)	<0.001*	-1.98(-4.75,0.78)	0.159
BAI	-1.46(-3.78,0.86)	0.217	-1.88(-4.31,0.55)	0.130	-4.24(-6.79,-1.70)	0.001*	-1.79(-5.45,1.87)	0.338
BDI	-1.96(-2.02,-1.90)	<0.001*	-3.81(-3.87,-3.74)	<0.001*	-5.41(-5.48,-5.34)	<0.001*	-4.77(-4.83,-4.71)	<0.001*
VAS-Pain	-1.08(-2.18,0.02)	0.055	-1.00(-2.42,0.41)	0.165	-2.18(-3.65,-0.71)	0.004*	-0.64(-1.95,0.68)	0.344
VAS-Urgent	-2.29(-3.74,-0.84)	0.002*	-2.75(-4.08,-1.42)	<0.001*	-3.46(-5.04,-1.88)	<0.001*	-0.63(-2.45,1.20)	0.502
GRA	0.39(-0.29,1.06)	0.265	0.08(-0.54,0.70)	0.808	0.84(0.25,1.43)	0.005*	-0.13(-0.83,0.56)	0.710

Adjusted for age, education and income, *p < 0.05.

ICSI, Interstitial Cystitis Symptom Index; ICPI, Interstitial Cystitis Problem Index; PUF, Pain, Urgency and Frequency score; BAI, Beck Anxiety Inventory; BDI, Beck Depression Inventory; GEE, Generalized Estimating Equation.

Table 2. ICSI - ICPI - The p values and effect sizes (β) compared with the first visit after two-weeks-treatment-program by using a generalized estimating equation model

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	β (95% CI)	p value	β (95% CI)	p value	β (95% CI)	p value	β (95% CI)	p value
ICSI-1	-0.53(-1.24,0.18)	0.142	-0.26(-0.92,0.41)	0.448	-1.14(-1.80,-0.48)	0.001*	-0.39(-1.46,0.68)	0.476
ICSI-2	-1.35(-2.25,-0.45)	0.003*	-1.06(-1.93,-0.18)	0.018*	-1.48(-2.35,-0.60)	0.001*	-0.41(-1.71,0.89)	0.540
ICSI-3	-0.78(-1.19,-0.36)	<0.001*	-0.39(-0.89,0.12)	0.132	-0.45(-1.07,0.17)	0.151	0.01(-0.38,0.40)	0.951
ICSI-4	-0.50(-1.11,0.11)	0.108	-0.14(-0.98,0.70)	0.743	-0.28(-1.24,0.67)	0.561	-0.31(-0.98,0.36)	0.368
ICSI-Total	-3.70(-5.60,-1.80)	<0.001*	-1.56(-3.43,0.31)	0.102	-3.74(-5.61,-1.87)	<0.001*	-1.11(-3.79,1.57)	0.416
ICPI-1	-0.92(-1.22,-0.62)	<0.001*	-0.63(-0.96,-0.30)	<0.001*	-0.93(-1.24,-0.62)	<0.001*	-0.67(-1.41,0.08)	0.078
ICPI-2	-1.01(-1.60,-0.41)	0.001*	-0.59(-1.25,0.08)	0.084	-0.60(-1.31,0.11)	0.095	-0.08(-0.67,0.51)	0.789
ICPI-3	-0.37(-0.98,0.25)	0.241	-0.55(-1.20,0.10)	0.097	-0.72(-1.45,0.01)	0.053	-0.29(-1.04,0.45)	0.442
ICPI-4	-0.27(-0.82,0.28)	0.335	-0.34(-1.04,0.36)	0.345	-0.79(-1.51,-0.07)	0.031*	-0.04(-0.62,0.54)	0.891
ICPI-Total	-1.29(-3.07,0.49)	0.156	-1.86(-3.67,-0.05)	0.044*	-4.54(-6.26,-2.82)	<0.001*	-0.60(-4.39,3.19)	0.757

Adjusted for age, education and income, *p < 0.05.

ICSI, Interstitial Cystitis Symptom Index; ICPI, Interstitial Cystitis Problem Index.

- (5) Limitation:
No cystodilation-only controlled group.

CONCLUSIONS

After cystodilation for IC/BPS patients, 4 times of pelvic floor muscle relaxation training and 3 times of autonomic biofeedback intervention can be used to improve short-term clinical severity, urinary tract symptoms and emotional symptoms. The improvement of depressive symptoms can last up to three months after the intervention, and the effect of symptom improvement in the medium and long term (six months) still needs to be further evaluated by increasing the number of cases and continuous follow-up.

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