Journal of Hainan Medical University

http://www.hnykdxxb.com

Effect of pelvic floor rehabilitation technique in preventing the postpartum pelvic floor dysfunction

Shi−Qiong Li, Li−Na Liu✉, Qing Gou, Xiao−Zhi Zhang

Department of Obstetrics and Gynecology, Fuling Central Hospital of Chongqing City, 408000

ARTICLE INFO

Article history:
Received 7 Nov 2016
Received in revised form 17 Nov 2016
Accepted 12 Nov 2016
Available online 24 Nov 2016

Keywords:
Pelvic floor rehabilitation technique
Pelvic floor dysfunction
Pelvic floor function

ABSTRACT

Objective: To explore the effect of pelvic floor rehabilitation technique in preventing the postpartum pelvic floor dysfunction and on the sexual life quality. **Methods:** A total of 286 puerpera with pelvic floor dysfunction who were admitted in our hospital from May, 2014 to May, 2015 42 d after delivery were included in the study, and randomized into the treatment group and the control group with 143 cases in each group. After guidance, the puerpera in the control group were given pelvic floor muscle training by themselves at home. On this basis, the puerpera in the treatment group were treated by the pelvic floor rehabilitation apparatus. The puerpera in the two groups were treated for 4 weeks. The pelvic floor function before treatment, 6 months and 1 year after delivery was detected. The color Doppler ultrasound apparatus was used to detect BSD, PUVA, UVJ-M, and BND 3 months after delivery. **Results:** BND, PUVA-R, PUVA-S, and UVJ-M 3 months after delivery in the treatment groups were significantly lower than those in the control group, while BSD-S was significantly higher than that in the control group. The improvement of type I and II muscle fiber fatigue (%), POP-Q degree, AP indication point (cm), and vaginal dynamic pressure (cmH_2O) was significantly superior to that in the control group. The comparison of pelvic floor muscle strength classification before treatment between the two groups was not statistically significant. After treatment, the pelvic floor muscle in the two groups was significantly strengthened, and the proportion of V grade patients was significantly increased when compared with before treatment. **Conclusions:** The postpartum early pelvic floor rehabilitation technique can effectively enhance the pelvic floor function, and prevent the postpartum pelvic floor dysfunction, with an accurate efficacy; therefore, it deserves to be widely recommended in the clinic.

1. Introduction

Pelvic floor dysfunction (PFD) is a common gynecological disease, belonging to the pelvic floor support tissue defect and damage disease, with clinical symptoms of SUI, POP, chronic pelvic pain, and sexual dysfunction[1,2]. Pregnancy and delivery are the independent risk factors for developing the pelvic floor muscle dysfunction and POP[3]. Some researches demonstrate that[4] spontaneous delivery can cause abnormal pelvic floor mechanism in the early stage, and enhance the occurrence rate of PFD, which can severely affect the women's health and life quality. Currently, it is generally believed that early pelvic floor muscle training after delivery has a certain effect in preventing PFD in the gestational period and after delivery[5]. The study is aimed to explore the effect of pelvic floor rehabilitation technique in preventing the postpartum pelvic floor dysfunction and on the sexual life quality.

2. Materials and methods

✉Corresponding author:Li-Na Liu, Department of Obstetrics and Gynecology, Fuling Central Hospital of Chongqing City, 408000.
Tel: 18716826675
E-mail: lishiqionglsq@126.com
Fund Project: The study was supported by the Medical and Scientific Research Project of Chongqing Hygiene Family Planning Commission with the number of 2015msxm161.

2.1. Clinical materials

A total of 286 puerpera with pelvic floor dysfunction who were admitted in our hospital from May, 2014 to May, 2015 42 d after delivery were included in the study, aged from 21 to 33 years old, with an average age of 28 years old. All the puerpera were in accordance with the related diagnostic criteria of PFD in the Clinical Practice Guideline of Pelvic Organ Prolapse (American Obstetrics and Gynecology Institute)[6]. Inclusion criteria: (1) Those who had full-term, single birth, and initial delivery; (2) Those whose vaginal posterior wall mucosa was bulged in a ball shape by the clinical examination; (3) Those who may have perineal laceration. Exclusion criteria: (1) Those who had urinary and fecal incontinence before pregnancy, pelvic organ prolapse, postpartum lochia duration, and vaginal bleeding; (2) Those who were merged with urogenital system disease, mental disorders, and dementia; (3) Those who had poor treatment compliance.

2.2. Methods

The patients were randomized into the treatment group and the control group with 143 cases in each group. The comparison of the average age between the two groups was not statistically significant (P>0.05), but it was comparable. After guidance, the puerpera in the control group were given pelvic floor muscle training by themselves at home, mainly including perineal contraction exercise to enhance the vaginal contraction ability and urine controlling ability, with perineal contraction each time≥3 s, 15-30 min/time, 2-3 times/d. On this basis, the patients in the treatment group were given pelvic floor nervous muscle low frequency electrical stimulation treatments by PHENIX U4 pelvic floor rehabilitation apparatus for 4 weeks. The first two weeks: the frequency was set as 8-33 Hz, with pulse width of 320-740 μs, 20 min/time, 2 times/week, meanwhile, the biological feedback treatment was performed, which could turn the muscle activity information into the signal through EMG to feedback to the patients to guide, correct, and promote their initiative pelvic floor muscle contraction training; 3-4 weeks: type II muscle fiber primary training was performed, with frequency set as 20-80 Hz and pulse width of 20-320 μs, treatment time and frequency were the same as the first two weeks.

2.3. Observation indicators

The color Doppler ultrasound apparatus was used to detect BSD, PUVA, UVJ-M, and BND 42 d and 3 months after delivery. PHENIX U4 rehabilitation system was used to detect the pelvic floor function indicators before treatment, 6 months and 1 year after treatment, including pelvic floor muscle strength, pelvic floor muscle fatigue, and vaginal dynamic pressure[7].

2.4. Statistical analysis

SPSS 22.0 software was used for the statistical analysis. The measurement data were expressed as mean ± SD. The paired t test was used for the intra-group comparison, and the independent t test was used for the comparison between the two groups. The enumeration data were expressed as percentage, and chi-square test was used. P<0.05 was regarded as statistically significant.

3. Results

3.1. Comparison of the ultrasound examination results before treatment and 3 months after delivery between the two groups

The comparison of BSD-R (cm), BSD-S (cm), PUVA-R (°), PUVA-S (°), BDN (cm), and UVJ-M (cm) before treatment between the two groups was not statistically significant (P>0.05). BND, PUVA-R, PUVA-S, and UVJ-M 3 months after delivery in the treatment groups were significantly lower than those in the control group (P<0.05), while BSD-S was significantly higher than that in the control group (P<0.05) (Table 1).

3.2. Comparison of the pelvic function before and after treatment between the two groups

The comparison of muscle fiber fatigue (%), POP-Q indication point (cm), and vaginal dynamic pressure (cmH_2O) before treatment between the two groups was not statistically significant (P>0.05). The improvement of type I and II muscle fiber fatigue (%), POP-Q indication point (cm), and vaginal dynamic pressure (cmH_2O) 6 months after delivery in the treatment group was significantly

Table 1.

Comparison of the ultrasound examination results before treatment and 3 months after delivery between the two groups.

Groups	n	Time	BSD-R	BSD-S	PUVA-R	PUVA-S	BDN	UVJ-M
Treatment	143	Before treatment	2.33±0.46	-0.06±0.74	102.49±9.10	135.52±18.71	2.39±0.65	1.75±0.52
		3 months after delivery	2.31±0.52$^{\#}$	0.85±0.25*	97.61±8.06$^{\#}$	116.76±11.23$^{*\#}$	1.46±0.56$^{*\#}$	1.52±0.49$^{*\#}$
Control	143	Before treatment	2.29±0.51	-0.06±0.78	109.33±8.91	135.21±19.01	2.28±0.76	1.69±0.67
		3 months after delivery	2.48±0.37*	0.56±0.21*	102.61±9.33	122.64±14.74*	1.92±0.70*	1.74±0.54

$^{*}P$<0.05, when compared with before treatment; $^{\#}P$<0.05, when compared with the control group.

Table 2.

Comparison of the pelvic function before and after treatment between the two groups.

Groups	*n*	Time	Muscle fiber fatigue		POP-Q indication point		Vaginal dynamic pressure
			Ⅰ type	Ⅱ type	C	AP	
Treatment	143	Before treatment	-0.81±2.12	-0.42±0.91	-4.73±3.52	-2.85±0.54	65.05±20.36
		6 months after delivery	-0.51±1.74*#	-0.22±0.86*#	-3.84±4.22*#	-3.17±0.54*#	79.26±22.54*#
		1 year after delivery	-0.25±1.92*	-0.26±1.23	-4.14±4.46	-3.06±0.43*	80.06±22.33*
Control	143	Before treatment	-0.88±1.96	-0.44±1.06	-4.65±3.65	-2.98±0.43	66.03±20.07
		6 months after delivery	-0.94±1.72	-0.51±1.22	-4.46±4.41	-2.93±0.32	73.02±22.84*
		1 year after delivery	-0.52±1.54*	-0.46±1.11	-4.05±4.32	-3.01±0.46*	82.08±22.27*

*P<0.05, when compared with before treatment; #P<0.05, when compared with the control group.

Table 3.

Comparison of the pelvic floor muscle strength before and after treatment between the two groups[n(%)].

Groups	*n*	Time	Grade 0	Grade I	Grade II	Grade III	Grade IV	Grade V
Treatment	143	Before treatment	30(20.98)	33(23.08)	18(12.59)	14(9.80)	16(11.19)	32(22.38)
		6 months after delivery	5(3.50)	9(6.29)	15(10.49)	28(19.58)	18(12.59)	54(37.76)*
		1 year after delivery	0(0)	3(2.10)	8(5.59)	28(19.58)	32(22.38)	65(45.45)
Control	143	Before treatment	28(19.58)	32(22.38)	21(14.69)	11(7.69)	20(13.99)	33(23.08)
		6 months after delivery	14(9.80)	20(13.99)	26(18.18)	15(10.49)	39(27.27)	48(33.57)*
		1 year after delivery	0(0)	8(5.59)	11(7.69)	29(20.28)	40(27.97)	55(38.46)

*P<0.05, when compared with before treatment.

superior to that in the control group (P<0.05) (Table 2).

3.3. Comparison of the pelvic floor muscle strength before and after treatment between the two groups

The comparison of pelvic floor muscle strength classification before treatment between the two groups was not statistically significant (P>0.05). After treatment, the pelvic floor muscle in the two groups was significantly strengthened, and the proportion of V grade patients was significantly increased when compared with before treatment (P<0.05). The comparison of pelvic floor muscle strength classification 6 months and 1 year after delivery between the two groups was not statistically significant (P>0.05) (Table 3).

4. Discussion

Pregnancy and delivery can damage the pelvic connective tissues, muscles, and nerves, which is an important factor for inducing PFD. During the gestation process, the gradually increased uterus can alter the body weight gravity axis, the abdominal pressure can produce strong pressure on the pelvic floor, and the pelvic floor muscle is relaxed due to continuous pressure; moreover, the delivery process can further damage the pelvic floor structure and pelvic muscle, still existing after delivery, which can be recovered through anal contraction exercise and postpartum exercise, but most females can not accurately identify the pelvic floor muscle, resulting in low exercise efficiency, which can induce PFD[8,9]. Some researches demonstrate that[10,11] the second labor stage extension, multiple production, and perineal laceration can damage the pelvic floor and urethral striated muscle, but this damage is mostly reversible, and can be effectively reversed through timely pelvic floor group rehabilitation training after delivery, which can positively prevent PFD.

The pelvic floor muscle can maintain the vaginal contraction degree, the normal location of pelvic organs, and the normal functions of urethral sphincter and rectal sphincter[12]. Due to pregnancy and delivery, the pelvic floor type I and II muscle fibers are stretched and damaged, which is a risk factor for developing POP and SUI[13]. The postpartum pelvic floor muscle training can help the puerpera to consciously contract and relax the pelvic floor muscle group in order to strengthen the pelvic floor muscle tension and tolerance, which can facilitate the effective repair of weak and relaxing pelvic floor muscle[14]. The pelvic floor rehabilitation apparatus can promote the passive contraction of pelvic floor muscle through exerting the electrical stimulation with a certain intensity on the abdominal wall and vagina, convert the muscle activity information into the auditory and visual signal through EMG to feedback to the patients for pelvic floor muscle training to form a conditioned reflex, and improve and correct the pelvic floor muscle contraction to recover and strengthen the normal contraction function of pelvic floor muscle[15]. The results in the study showed that the improvement of type I and II muscle fiber fatigue (%), POP-Q degree, AP indication point (cm), and vaginal dynamic pressure (cmH_2O) was significantly superior to that in the control group (P<0.05); after treatment, the pelvic floor muscle in the two groups was significantly strengthened, and the proportion of V grade patients was significantly increased when compared with before treatment (P<0.05), indicating that the pelvic floor rehabilitation technique can effectively alleviate the pelvic floor muscle fiber fatigue after delivery. Moreover, the results in the study

showed that BND, PUVA-R, PUVA-S, and UVJ-M 3 months after delivery in the treatment groups were significantly lower than those in the control group (P<0.05), while BSD-S was significantly higher than that in the control group (P<0.05), proving that the early pelvic floor rehabilitation technique is beneficial for the recovery of pelvic floor function after delivery, with a significant efficacy.

In conclusion, the postpartum early pelvic floor rehabilitation technique can effectively enhance the pelvic floor function, and prevent the postpartum pelvic floor dysfunction, with an accurate efficacy; therefore, it deserves to be widely recommended in the clinic.

References

[1] Xiaojing L, Xue S, Xinling S. Application value of pelvic floor reconstruction surgery in the treatment of female pelvic floor dysfunction and the effect analysis. *J Hunan Norm Univ* 2015; **12**(1): 132-134.

[2] Weiguo J, Shuhui H. Diagnosis and treatment progress of female pelvic floor dysfunction. *Shandong Med J* 2015; **55**(45): 26-29.

[3] Jiankun T, Yanping T, Xiaoli L. Study on the effect of postpartum pelvic floor rehabilitation technique in preventing the female pelvic floor dysfunction. *Chin J Woman Child Health Res* 2016; **27**(2): 228-230.

[4] Li H. Evaluation of the rehabilitation treatment of pelvic floor dysfunction. *Chin J Family Plan Gnecotokol* 2016; **8**(8): 1-2, 14

[5] Weiwei L. Diagnosis and treatment status and measures of pelvic floor diseases. *Chin Commun Doc* 2016; **32**(25): 11-11, 14

[6] Wei H, Wei J. Study on the effect of pelvic floor rehabilitation technique in preventing the female pelvic floor dysfunction in the perinatal stage and the sexual life quality. *Matern Child Health Care China* 2016; **31**(16): 3396-3398

[7] Wei Z, Ya Z, Shuang X. Three-dimensional ultrasonography in evaluating pelvic diaphragm hiatus after pelvic floor rehabilitation in postpartum women. *J Chin Pract Diagn Ther* 2016; **30**(8): 808-810

[8] Li C, Yaling J, Xiaojun P. Effect of postpartum pelvic floor function training on the pelvic floor muscle and urination function. *Anhui Med J* 2016; **37**(2): 140-143.

[9] Yanping T, Jiankun T, Sewei L. Study on the correlation of postpartum pelvic floor dysfunction with pelvic muscle contraction. *Chin J Woman Child Health Res* 2015; **26**(6): 1254-1256.

[10]Huan L, Tengfei L, Danyan L. The third part of postpartum pelvic floor rehabilitation procedure-postpartum pelvic floor rehabilitation measures and implementation. *Chin J Pract Gynecol Obstetr* 2015; **31**(6): 522-529.

[11]Haiying L, Tao W, Fang Z. Study on the correlation of the second labor stage time of labor analgesia with the pelvic floor function. C*hin J Pract Gynecol Obstetr* 2016; **32**(2): 185-187.

[12]Ruimin J. Effect of pelvic floor muscle training on the female postpartum pelvic floor dysfunction. *J Med Forum* 2013; **34**(3): 68-69.

[13]Yanhui C, Weiping Y, Minduan D. Rehabilitation effect of pelvic floor muscle training on the female pelvic floor dysfunction. *Guangdong Med J* 2012; **33**(6): 757-759.

[14]Yuanwen L, Jianmei L. Rehabilitation effect of pelvic floor muscle training on the female pelvic floor dysfunction. *Modern Diagn Treat* 2015; **26**(18): 4220-4221.

[15]Zhijing S, Lan Z, Jinghe L. Effect of postpartum pelvic rehabilitation training in preventing the female pelvic floor dysfunction. *Chin J Obstetr Gynecol* 2015; **50**(6): 420-427.

[16]Hagen S, Stark D, Glazener C. Individualised pelvic floor muscle training in women with pelvic organ prolapse (POPPY): a multicentre randomised controlled trial. *Lancet* 2014; **383**(9919): 796-806.