ORIGINAL RESEARCH ARTICLE

Effect of easy cupping combined with pelvic floor electrical stimulation and Kegel exercise and pelvic floor muscle surface electromyography on symptoms improvement in women with stress urinary incontinence

DOI: 10.29063/ajrh2024/v28i9.16

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Abstract

This study aimed to evaluate the effectiveness of easy cupping combined with pelvic floor electrical stimulation and Kegel exercises in treating female patients with stress urinary incontinence (SUI). Ninety SUI patients were randomly assigned to two groups: the control group (pelvic floor electrical stimulation + Kegel exercises) and the experimental group (easy cupping + pelvic floor electrical stimulation + Kegel exercises). Outcomes assessed included pelvic floor muscle strength, urinary incontinence, urinary leakage, pelvic floor muscle surface electromyography, adverse effects, and patient satisfaction before and after treatment. Results showed significant improvements in pelvic floor muscle strength, International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICI-Q-SF) scores, and urinary leakage in both groups, with the experimental group showing greater improvements ($P < 0.05$). The experimental group also had higher pelvic floor muscle potential values and a greater total effective rate ($P < 0.05$). No significant differences in adverse effects were noted between groups, and patient satisfaction was higher in the experimental group ($P < 0.05$). In conclusion, the combination of easy cupping with pelvic floor electrical stimulation and Kegel exercises effectively enhances pelvic floor muscle strength, reduces urinary leakage, and improves patient satisfaction in women with stress urinary incontinence. *(Afr J Reprod Health 2024; 28 [9]: 172-179).*

Keywords: Easy cupping; Pelvic floor electrical stimulation; Kegel exercise; Female stress urinary incontinence; Symptom; Pelvic floor muscle surface electromyography

Résumé

Cette étude visait à évaluer l'efficacité des ventouses faciles combinées à la stimulation électrique du plancher pelvien et aux exercices de Kegel dans le traitement des patientes souffrant d'incontinence urinaire d'effort (IUE). Quatre-vingt-dix patients SUI ont été répartis au hasard en deux groupes : le groupe témoin (stimulation électrique du plancher pelvien + exercices de Kegel) et le groupe expérimental (ventouses faciles + stimulation électrique du plancher pelvien + exercices de Kegel). Les résultats évalués comprenaient la force musculaire du plancher pelvien, l'incontinence urinaire, les fuites urinaires, l'électromyographie de la surface des muscles du plancher pelvien, les effets indésirables et la satisfaction des patients avant et après le traitement. Les résultats ont montré des améliorations significatives de la force musculaire du plancher pelvien, des scores de la Consultation internationale sur l'incontinence (ICI-Q-SF) et des fuites urinaires dans les deux groupes, le groupe expérimental montrant de plus grandes améliorations ($P < 0,05$). Le groupe expérimental présentait également des valeurs de potentiel musculaire du plancher pelvien plus élevées et un taux effectif total plus élevé ($P < 0,05$). Aucune différence significative dans les effets indésirables n'a été notée entre les groupes et la satisfaction des patients était plus élevée dans le groupe expérimental ($P < 0,05$). En conclusion, la combinaison de ventouses faciles avec la stimulation électrique du plancher pelvien et les exercices de Kegel améliore efficacement la force musculaire du plancher pelvien, réduit les fuites urinaires et améliore la satisfaction des patientes souffrant d'incontinence urinaire d'effort. *(Afr J Reprod Health 2024; 28 [9]: 172-179).*

Mots-clés: Ventouses faciles ; Stimulation électrique du plancher pelvien ; exercice de Kegel ; Incontinence urinaire d'effort chez la femme ; Symptôme; Électromyographie de la surface des muscles du plancher pelvien

Introduction

Female stress urinary incontinence (SUI) is a urologic disorder in which leakage of urine is not controlled with consciousness, occurring when women have elevated abdominal pressure[1]. Although female SUI is not life-threatening, it often easily affects their normal lives and causes heavy

psychological stress to affected women[2]. Pelvic floor electrical stimulation and pelvic floor rehabilitation are common therapies for the clinical treatment of female SUI> However, despite their effects in enhancing pelvic floor function and improving clinical symptoms, they still have limited efficacy[3]. The traditional Chinese medicine holds that kidney Qi is deficient, then urinary incontinence, and acupoint stimulation can benefit Qi to replenish the kidney and improve urinary control ability[4]. Fire cupping (cupping) is a kind of Chinese medicine that uses a can as a tool, using fire, pumping and other methods to generate negative pressure, so that it is adsorbed on the surface of the body, resulting in local blood stasis, in order to achieve the effects of opening the meridians and activating collaterals, activating qi and activating blood flow, relieving swellings, relieving pain, dispelling wind and dispersing cold and so on. Appropriate cupping was selected according to the patient's treatment site, and the treated cupping was treated on the site where cupping was required after disinfection of tweezers. The cupping time was 10 to 15 minutes. After cupping, do not force cupping, gently press the skin of the patient, and remove the cupping mouth after contact with air. In the process of cupping, it is necessary to observe the patient's complexion and the skin color at the cupping place to avoid damage to the patient's skin due to operational errors. Easy cupping is a treatment device designed according to the principle of cupping therapy, and application of it to female SUI can effectively improve the efficacy, but there is no related study on easy cupping therapy for treating female SUI in clinic[5]. Easy cupping combined with pelvic floor electrical stimulation + Kegel exercise was applied to the clinical treatment of female SUI in Zhejiang Jinhua Guangfu Tumor Hospital from May 2021 to October 2022 to evaluate its effects on symptom improvement and pelvic floor muscle surface electromyography.

Methods

Clinical data

Ninety female SUI patients (aged 40-68 years, mean (46.03 ± 4.92) years) who were treated in our hospital from May 2021 to October 2022 were selected; disease duration ranged from 0.5-6 years, mean (2.38 ± 0.26) years; menstrual status: 56 premenopausal, 20 transitional, and 14 postmenopausal. Inclusion criteria: those diagnosed with SUI according to the "Guidelines for the Diagnosis and Treatment of Female SUI"[6] with complete clinical data; and who gave informed consent. Exclusion criteria: those with bleeding tendency; those with edema throughout the body; skin allergy, those with broken ulcers; febrile, convulsive, spasmodic; pregnant woman; history of pelvic floor surgery; metal modulator implanters; those with other types of urinary incontinence; those with acute and chronic inflammation in the genital and urinary systems; those with poor adherence; use pacemaker. All female SUI patients were divided into experimental (n = 45) and control (n = 45) groups according to the random number table method. As shown in Table 1, there was no difference in baseline data between the two groups (P > 0.05). See Table

Control group

The control group underwent pelvic floor electrical stimulation , Kegel exercise therapy, and Pelvic floor electrical stimulation: The vaginal electrode was inserted into the vagina while the other end of the electrode was connected to the pelvic floor rehabilitation therapy apparatus; The first stimulation was for 20 min with low-frequency electrical current, pulse width 250 ～ 740μs, and frequency 8～100Hz. The intensity of the current was adjusted according to the patient's actual condition until the patient felt the pelvic floor muscle was beating and had no pain sensation,.q

Experimental group

The experimental group underwent easy cupping combined with pelvic floor electrical stimulation, and Kegel exercise therapy as was done for the control group. In addition, easy cupping therapy was done for the experimental group as follows: Taking Qi Hai acupoint, Shen Yu acupoint, Ci Liao acupoint and Guan Yuan acupoint, taking 4 easy cuppings,

Table 1: Comparison of baseline data between the two groups

Baseline data	Experimental group (n = 45)	Control group (n = 45)	χ^2/t	*P*
Age (years)	46.11±4.94	45.98±4.90	0.1253	0.9005
Disease duration (years)	2.35±0.24	2.40±0.28	0.9095	0.3656
Menstrual status (premenopausal / transitional / postmenopausal)	27/11/7	29/9/7	0.2714	0.8731
Number of pregnancies (times)	2.59±0.30	2.54±0.26	0.8449	0.4005

first inverting it so that easy cupping come into contact with the center of the above acupoint skin epidermis, and then everting the easy cupping so that the edge of easy cupping cling to the skin and then letting go, 30 min/time, 1 time/d, for 8 weeks.

Observation criteria

Pelvic floor muscle strength urinary incontinence, urinary leakage; pelvic floor muscle surface electromyography and adverse effects were observed in the control and experimental groups before and after treatment. Pelvic floor muscle strength was evaluated by hand ophthalmoscopy and electro ophthalmoscopy and was grade 5: pelvic floor muscle contraction was complete and sustained confrontation maintenance time ≥ 5s; grade 4: pelvic floor muscles contraction complete, confrontation slight; grade 3: pelvic floor muscles contraction complete, no confrontation; grade 2: incomplete pelvic floor contraction, 2s duration; grade 1: tremulous contraction of pelvic floor muscles, and its duration was 1s; grade 0: pelvic floor muscles showed no contraction. Urinary incontinence was evaluated with the urinary incontinence questionnaire short form International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICI-Q-SF), ICI-Q-SF score = number of urinary leakage score + urinary leakage volume score + impact of urinary leakage on life score. The number of urinary leakage was scored: 0 point: no urinary leakage; 1 point: 1 time/week; 2 points: 2～3 times/week; 3 points: 1 time/d; 4 points: multiple times/d; 5 points: urinary leakage was always present. Urinary leakage score: 0 points: no urinary leakage; 2 points: small volume of urinary leakage; 4 points: moderate volume of urinary leakage; 6 points: massive volume of urinary leakage. Impact of urinary leakage on life score: Patients were scored according to practice, with a score ranging from 0 to 10 points.

Urinary leakage was evaluated by the 1hr urine pad test. Pelvic floor muscle surface electromyography was evaluated by Glazer method and the instrument was MyoTracPro type bio stimulation feedback instrument to evaluate the value of pelvic floor muscle potentials of class I and class II, respectively.

Efficacy evaluation criteria

The efficacy evaluation criteria were based on the related criteria according to the "Guidelines for the Diagnosis and Treatment of Female Stress Urinary Incontinence". Cure was confirmed when no urinary leakage occurred during coughing or other instances of increased abdominal pressure.; Minimal effects was shown when leakage occurred with an increased abdominal pressure such as cough, and the urinary leakage volume of 1h pad test was reduced by ≥1/2 compared to before treatment. Treatment was ineffective when leakage occurred when there is an increased abdominal pressure such as in coughing, and compared to before treatment, the 1h pad test urinary leakage volume decreased by ＜1/2.

Statistical methods

The data were analyzed with SPSS 19.0 statistical software, and the quantitative data were described in mean and standard deviation ($\bar{x}$±s), and paired t-tests was used for comparisons within groups, while independent samples t-tests was used for comparisons between two groups. qualitative data

were expressed as percentage of cases and χ^2 test was performed for comparison between groups, rank sum test was performed for ranked data. Examination level α is 0.05.

Ethical considerations

The study was approved by the Ethics Committee of Zhejiang Jinhua Guangfu Tumor Hospital, Approval number: EC202103112.

Results

Comparison of pelvic floor muscle strength between two groups

Before treatment, there was no difference in pelvic floor muscle strength grade between the two groups (P > 0.05); after treatment, pelvic floor muscle strength grading improved significantly in both groups compared with the preoperative values, with the experimental group improved better than the control group (P < 0.05). See Table 2.

Comparison of urinary incontinence and urinary leakage between the two groups

Before treatment, there were no differences in ICI-Q-SF scores, urinary leakage by 1h urine pad test between the two groups (P > 0.05); after treatment, the ICI-Q-SF scores and the urinary leakage volume of the 1h urine pad test in both groups were reduced compared with the preoperative values, and the experimental group was smaller than the control group (P < 0.05). See Table 3.

Table 2: Comparison of pelvic floor muscle strength between the two groups ($\bar{x}$±s)

Time	Pelvic floor muscle strength grading	Experimental group (n = 45)	Control group (n = 45)	U	*P*
Before treatment	Grade 2 and below	30（66.67）	28（62.22）	0.4654	0.6417
	Grade 3	8（17.78）	9（20.00）		
	Grade 4	7（15.55）	7（15.55）		
	Grade 5	0（0.00）	1（2.22）		
After treatment	Grade 2 and below	2（4.44）	3（6.67）	2.0511	0.0403
	Grade 3	3（6.67）	5（11.11）		
	Grade 4	6（13.33）	13（28.89）		
	Grade 5	34（75.55）	24（53.33）		

Table 3: Comparison of urinary incontinence and urinary leakage ($\bar{x}$±s) between the two groups

Indicator	Time	Experimental group (n = 45)	Control group (n = 45)	*t*	*P*
ICI-Q-SF score (points)	Before treatment	16.74±1.92	16.71±1.90	0.0745	0.9408
	After treatment	8.27±0.86[a]	11.18±1.35[a]	12.1955	0.0000
urinary leakage volume by 1h urine pad test (g)	Before treatment	4.64±0.49	4.62±0.47	0.1976	0.8438
	After treatment	1.42±0.16[a]	1.85±0.21[a]	10.9259	0.0000

Notes: Compared with pretreatment, [a]P < 0.05. (Same Table 4)

Table 4: Comparison of values of potentials of pelvic floor muscle surface electromyography between two groups ($\bar{x}$ ±s, μV)

Indicator	Time	Experimental group (n = 45)	Control group (n = 45)	*t*	*P*
Class I muscle potential values	Before treatment	17.32±1.95	17.40±1.98	0.1931	0.8473
	After treatment	37.27±3.92[a]	30.26±3.32[a]	9.1541	0.0000
Class II muscle potential values	Before treatment	39.76±4.28	39.81±4.31	0.0552	0.9561
	After treatment	56.83±5.92[a]	50.27±5.24[a]	5.5662	0.0000

Table 5: Comparison of clinical efficacy between the two groups [n (%)]

Indicator	Experimental group (n = 45)	Control group (n = 45)	χ^2	*P*
Cure	30 (66.67)	21 (46.67)		
Showing effect	12 (26.67)	16 (35.56)		
Ineffective	3 (6.67)	10 (22.22)		
Total effective	42 (93.33)	35 (77.78)	4.3566	0.0369

Table 6: Comparison of adverse effects between two groups [n (%)]

Indicator	Experimental group (n = 45)	Control group (n = 45)	χ^2	*P*
Lumbago	1 (2.22)	1 (2.22)		
Sweat out	1 (2.22)	1 (2.22)		
Lower back discomfort	0 (0.00)	1 (2.22)		
Red mark	4 (8.89)	0 (0.00)		
Total	6 (13.33)	3 (6.67)	0.4938	0.4822

Table 7: Comparison of patient satisfaction between the two groups [n (%)]

Indicator	Experimental group (n = 45)	Control group (n = 45)	χ^2	P
Particularly satisfied	32 (71.11)	20 (44.44)		
Satisfied	12 (26.67)	18 (40.00)		
General	1 (2.22)	6 (13.33)		
Dissatisfied	0 (0.00)	3 (6.67)		
Overall satisfaction	44 (97.78)	38 (84.44)	4.8841	0.0271

Note: overall satisfaction = particularly satisfied + satisfied.

Comparison of pelvic floor muscle potential values between the two groups

Before treatment, there were no differences in the values of pelvic floor muscle potentials of class I or II between the two groups (P > 0.05); after treatment, the values of pelvic floor muscle potentials of class I and II were higher in both groups than before surgery, and they were higher in the experimental group than in the control group (P < 0.05). See Table 4.

Comparison of clinical efficacy between the two groups

The total effective rate of the experimental group was greater than that of the control group ($P < 0.05$). See Table 5.

Comparison of adverse effects between two groups

There was no difference in adverse effects between the two groups ($P > 0.05$). See Table 6.

Comparison of satisfaction between the two groups

Patient satisfaction was higher in the experimental group than in the control group ($P < 0.05$). See Table 7.

Discussion

Normal closure of urethral mucosa and urethral sphincter, normal pelvic floor muscle and neurological function are the key points for autonomous urinary control[7]. In SUI, pelvic floor muscle and neurological functions are reduced, pelvic floor function and urethral dynamics are altered, autonomic continence is reduced, leading to involuntary release of urine when abdominal pressure increases.[8]. Therefore, improving pelvic floor muscle function, increasing urethral closure pressure, and improving patient continence become the key points in the clinical treatment of female SUI[9]. Pelvic floor electrical stimulation can deliver electric current of different intensity to the pelvic floor, produce stimulation to the pelvic floor muscles and nerves, promote the recovery of musculofascial tone, enhance pelvic floor muscle function, and improve the coordination of the pelvic floor muscle group. It can also improve the self-control ability of the pelvic floor muscle group, reflexively decrease bladder excitability, increase urethral closure pressure, and improve patient continence[10]. Kegel exercise can exercise the pelvic floor muscles, improve their elasticity and strength, and promote the recovery of function of the relaxed pelvic floor muscles[11]. Kegel exercise promotes rhythmic vaginal contractions, increases urethral resistance, improves patient continence of the micturition reflex, and avoids the occurrence of SUI[12]. Kegel exercise also improves urethral blood circulation, promotes local muscle and neurological function recovery, and corrects urodynamics[13]. Because the efficacy of monotherapy of the above two therapies for female SUI is mostly unsatisfactory, the combination of the two therapies is clinically used mostly to increase the efficacy and improve the symptoms[14].

The results of this study indicate that the pelvic floor muscle strength grade in the experimental group was better than in the control group. The ICI-Q-SF score, urinary leakage in 1h urine pad test was less than that in the control group, and the total effective rate was greater than that in the control group, which indicated that compared with pelvic floor electrical stimulation + Kegel exercise, easy cupping combined with pelvic floor electrical stimulation + Kegel exercise can improve pelvic floor muscle strength in female SUI patients. It also enhances the patient's ability to control urine, improve the efficacy, effectively avoid the occurrence of urinary incontinence and urinary leakage. Easy cupping is a new medical tool developed on the basis of fire cupping, and its principle is the same as that of common cupping, which can exhaust air from the cupping to produce negative pressure, cause congestion of the adsorbed local tissues, improve the local blood circulation, and regulate the excitation and inhibition of higher neural centers to return to a balanced state[15]. Easy cupping can stimulate acupoints and reach the purpose of acupuncture points, clearing and activating the channels and collaterals, and soothing the condition[16]. In addition, easy cupping has the advantages of being noninvasive, painless, free of side effects, reusable, and do not affect life and work when used. The traditional Chinese medicine holds that the occurrence of SUI is deficiency of kidney Yang, so bladder loss and unable for constraint, so that clinically, it needs to replenish kidney aiding Yang and tonify Qi and kidney[17]. In this study, easy cupping stimulates Shen Yu acupoints and Ci Liao acupoints to reinforce the kidney Yang and enhance

reproductive function; stimulating Guan Yuan acupoints can replenish qi and raise yuan and relieve desertion and tonify Yang, thus achieving the purposes of invigorating kidney and strengthening yang, tonifying Qi and kidney, boosting bladder function, promoting pelvic floor muscle and neurological function recovery, and treating SUI[18].

In this study, the class I and class II pelvic floor muscle potentials of the two groups were improved after treatment, and the improvement of the experimental group was higher than that of the control group. These results indicate that compared with simple pelvic floor electrical stimulation combined with Kegel exercise, the easy pot combined with pelvic floor electrical stimulation and Kegel exercise is more effective in improving the electrophysiological response of pelvic floor muscles. This treatment can inhibit the occurrence of stress urinary incontinence (SUI) under stress conditions such as increased abdominal pressure[19]. By stimulating specific acupoints, the easy pot can initiate the neuromuscular coupling mechanism of the pelvic floor, stimulate the autonomic nerve reflex activity, improve the endurance of the pelvic floor related muscle groups, keep them in a state of anti-incontinence, enhance the urinary control function of the pelvic floor muscle, and avoid the occurrence of urine leakage [20]. In addition, there was no significant difference in adverse effects between the two groups in this study, and none of the adverse effects had a significant effect on patients, indicating a high safety profile of both therapies.

Write here the strengths and limitations as well as the implications of the study for policy and practice.

Conclusion

In conclusion, easy cupping combined with pelvic floor electrical stimulation + Kegel exercise in the treatment of female SUI can enhance pelvic floor muscle strength of patients, improve patients' urinary leakage, improve pelvic floor muscle potential values, have significant efficacy, good safety, and high patient satisfaction, which is worth recommending for the clinical treatment of female SUI.

Authors' contributions

Jingfen Zhang and Lihua Lou designed the experiment; Wu Leijuan conducted experiments; Zhang Jingfen analyzed experimental results, analyzed sequencing data and developed analytical tools. Zhang Jingfen assisted Illumina in sequencing. Zhang Jingfen and Lou Lihua wrote the manuscript.

Acknowledgements

We would like to express our sincere gratitude to all those who contributed to the completion of this study.

Conflict of interests

The authors declare no competing interests.

Funding

Jinhua Science and Technology Plan Project（No: 2021-4-086).

References

1. Caldwell L and White AB. Stress Urinary Incontinence: Slings, Single-Incision Slings, and Nonmesh Approaches. Obstet Gynecol Clin North Am, 2021, 48(3): 449-466.doi: 10.1016/j.ogc.2021.05.003
2. Preda A and Moreira S. Stress Urinary Incontinence and Female Sexual Dysfunction: The Role of Pelvic Floor Rehabilitation. Acta Med Port, 2019, 32(11): 721-726.doi: 10.20344/amp.11635.
3. Gonzales AL, Barnes KL, Qualls CR, Burgio KL and Richter HE. Prevalence and Treatment of Postpartum Stress Urinary Incontinence: A Systematic Review. Female Pelvic Med Reconstr Surg, 2021, 27(1): e139-e145.doi: 10.1097/SPV.0000000000000933.
4. He Yubo, Zhi Jianfeng, Xu Wenwen, Zhao Xiaoming and Liu Xiaoyan. Clinical observation of acupuncture combined with pelvic floor rehabilitation training for postpartum SUI [J]. Chinese Journal of Traditional Medical Science and Technology, 2022, 29 (3): 420-421.doi: 10.3969/j.issn.1674-070X.2022.03.029.
5. Huang Zhuojian, Shen Jian, Gao Shengjia and Wu Hongbo. Progress in clinical application of easy cupping therapy [J]. Journal of China Prescription Drug, 2022,

20 (1): 184-185.doi: 10.3969/j.issn.1671-4106.2022.01.092.
6. Gynecological Pelvic Floor Group, Section of Obstetrics and Gynecology, Chinese Medical Association. Guidelines for the diagnosis and management of stress urinary incontinence in women (2017) [J]. Chinese Journal of Obstetrics and Gynecology, 2017, 52 (5): 289-293.doi: 10.3760/cma.j.issn.0529-567X.2017.05.001.
7. Fuselier A, Hanberry J, Margaret Lovin J, Komesu Y and Rogers RG. Obesity and Stress Urinary Incontinence: Impact on Pathophysiology and Treatment. Curr Urol Rep, 2018, 19(1): 10.doi: 10.1007/s11934-018-0746-5.
8. Marques SAA, Silveira SRBD, Pássaro AC, Alexandre SM and Costa RAV. Effect of Pelvic Floor and Hip Muscle Strengthening in the Treatment of Stress Urinary Incontinence: A Randomized Clinical Trial. J Manipulative Physiol Ther, 2020, 43(3): 247-256.doi: 10.1016/j.jmpt.2019.08.007 .
9. Itkonen Freitas AM, Rahkola-Soisalo P, Mikkola TS, Heinonen PK and Haimi M. Current treatments for female primary stress urinary incontinence. Climacteric, 2019, 22(3): 263-269.doi: 10.1080/13697137.2019.1595244 .
10. Dmochowski R, Lynch CM, Efros M, Nyirjesy P and Whitmore K. External electrical stimulation compared with pharmacologic treatment of urge urinary incontinence in women: A randomized controlled trial. Obstet Gynecol, 2019, 133(5): 1025-1033.doi: 10.1097/AOG.0000000000003245
11. Kucukkaya B and Kahyaoglu Sut H. Effectiveness of pelvic floor muscle and abdominal training in women with stress urinary incontinence. Psychol Health Med, 2021, 26(6): 779-786.doi: 10.1080/13548506.2020.1813932.
12. Jose-Vaz LA, Andrade CL, Cardoso LC, Rodrigues AN and Sacomori C. Can abdominal hypopressive technique improve stress urinary incontinence? An assessor-blinded randomized controlled trial. Neurourol Urodyn, 2020, 39(8): 2314-2321.doi: 10.1002/nau.24463.
13. Mikuš M, Fišter K, Škegro B, Vujević M and Vojnović D. Comparison of efficacy of extracorporeal magnetic innervation and Kegel exercises for stress urinary incontinence in adult women: study protocol for a randomized controlled trial. Prz Menopauzalny, 2021, 20(4): 193-200.doi: 10.5114/pm.2021.112649.
14. Kaufmann A. Therapeutic options in female stress urinary incontinence. Aktuelle Urol, 2021, 52(3): 245-254.doi: 10.1055/a-1374-0678.
15. Meng Yingying, Li Xia, Yu Jianmin, Zhao Xiaoqin and Wu Jianghai. A clinical study of five-tone therapy combined with easy cupping for the treatment of low back pain with liver and kidney deficiency syndrome [J]. Journal of New Chinese Medicine, 2022, 54 (18): 79-83.doi: 10.3969/j.issn.0256-7415.2022.18.018.
16. Zhang Xufen, Tang Ding, He Weile, Huang Weizhong and Zhou Wenwen. Two experimental cases of treating facial disfiguring skin disease using centro-square needling method combined with easy cupping [J]. Zhejiang Journal of Traditional Chinese Medicine, 2021, 56 (5): 371.doi: 10.3969/j.issn.1005-5509.2021.05.011.
17. Wu Zhaoxia, Xu Xin and Xu Hai. Effect of Jianpi Yishen formula and biofeedback combined with pelvic floor muscle function training for stress urinary incontinence in elderly women [J]. Chinese Journal of Surgery of Integrated Traditional and Western Medicine, 2022, 28 (5): 616-622.doi: 10.3969/j.issn.1007-6948.2022.05.014.
18. Chen F, Zhou J, Wu W, Zhao H, Zhu X and Wang Y. Study on the therapeutic effect of floating needle therapy combined with pressing acupoint embedding for female stress urinary incontinence after childbirth: a randomized trial. Ann Palliat Med, 2021, 10(7): 7786-7793.doi: 10.21037/apm-21-889.
19. Hu Yang, Lou Yelin, Zhang Heng, Chen Zhiyong, Zhao Wei and Liu Yue. Correlation study between pelvic floor ultrasound and pelvic floor muscle electrophysiological parameters for the assessment of stress urinary incontinence in postpartum women [J]. Zhejiang Medicine, 2022, 44 (10): 1099-1103.doi: 10.3969/j.issn.1006-2785.2022.10.014.
20. Liu Kaihong, Hao JieqianShang Yumin. Efficacy observation of biofeedback combined with acupoint electrical stimulation for stress urinary and incontinence in elderly women [J]. Chinese Journal of Rehabilitation Medicine, 2018, 33 (12): 1457-1459.doi: 10.3969/j.issn.1001-1242.2018.12.016.