

Original Article

The effect of holographic meridian scraping therapy combined with free position on the labor process, perineum lateral resection rate, and delivery outcomes of primiparae

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Abstract: Objective: To explore the effect of holographic meridian scraping combined with free body positions on the stages of labor, the perineal lateral resection rate, and the delivery outcomes of the primipara. Methods: A total of 120 primiparous women in natural labor admitted to Hebei Provincial Hospital of Traditional Chinese Medicine (HPH-TCM) from January 2020 to September 2020 were recruited as the study cohort. The cohort of parturients was divided into a conventional treatment group (the conventional group) or a combined treatment group (the combined group). Both groups gave birth in free positions, and the combined treatment group also underwent holographic meridian scraping therapy. We compared the two groups of parturients in terms of their labor times, their postpartum hemorrhages within two hours, their delivery indicators (vaginal delivery rate, cesarean section rate, oxytocin application rate during labor), and their perineal injury indicators (perineal injury degree, perineal lateral resection rate, and delivery satisfaction rate). The two groups' pain and anxiety levels were evaluated, and the newborns' weights and health conditions after delivery were compared. Results: The combined treatment group's maternal pain and anxiety scores were lower, their labor times were shorter, their postpartum blood loss in two hours was less than it was in the conventional group ($P < 0.05$). The vaginal delivery rate, oxytocin injection rate, and cesarean section rate in the combined group were lower than they were in the conventional group during labor ($P < 0.05$). The combined group's maternal perineal injury levels and perineal lateral resection rate were lower, and the delivery satisfaction rate and the newborns' Apgar scores were higher than they were in the conventional group ($P < 0.05$). Conclusion: All labor stages of primipara can be shortened, their mental state and health conditions improved, their perineal lateral resection rate lessened, and their perineal injury degrees and pain reduced through free delivery positions combined with holographic meridian scraping treatment.

Keywords: Primipara, holographic meridian scraping, labor, perineal injury, lateral perineal resection, Apgar scores of newborns

Introduction

Natural childbirth refers to, on the premise of healthy pregnant women and normal fetal development, the natural delivery process of the fetus through the vagina without manual intervention [1-3]. Natural delivery conforms to the natural physiological process, with less damage to the mother and the babies, and fewer related complications, which is the first choice for mothers [4, 5]. As is known, pain and the delivery position are critical interfering fac-

tors in the vaginal delivery of primipara [6, 7]. In recent years, it has become an important clinical topic in obstetrics departments domestically to promote natural delivery and reduce the cesarean section rate. In spite of the meaningful effect of analgesic drugs on childbirth, there still exists many risks, which lead to somber prognoses among mothers and infants. Apart from promoting the labor progress, reducing obstetric intervention and the cesarean section rate, non-pharmaceutical analgesia is considered safer for mothers and babies. As a new

auxiliary method for natural delivery, and a way to complete delivery in a comfortable posture based on the feelings of the parturient, free position (all fours) can reduce the pain in pregnant woman to a certain extent. However, the effectiveness of free position in delivery needs to be further improved. Based on the theory of traditional Chinese medicine (TCM), combined with clinical experience, a set of holographic meridian scraping methods combined with free position has been developed by our hospital and applied in childbirth, which is conducive to relieving maternal pain and facilitating the progress of labor, and it has no adverse effects. Hence, this study was undertaken to evaluate the effect of its application objectively.

Data and methods

Subjects

A total of 120 parturient primiparae admitted to HPH-TCM from January 2020 to September 2020 were recruited as the study cohort and randomly placed into the conventional group or the combined group according to their order of admission, with 60 primiparae in each group. Inclusion criteria: ① Primiparae expected to give birth in our hospital, with a gestational age between 37 and 41 weeks. ② Primiparae with monocytesis, normal pelvic diameters and the fetal head pointing downwards. ③ Primiparae between 20 and 34 years old. ④ Primiparae with no pregnancy complications or other complications upon admission. ⑤ Primiparae able to adhere to free position in labor and delivery and who signed the informed consent. ⑥ Primiparae with complete perinatal data in our hospital. Exclusion criteria: ① Parturients with psychiatric diseases, communication disorders, or cognitive dysfunction. ② Parturients with ruptured fetal membranes or a high fetal presentation. ③ Parturients with limb movement dysfunction. ④ Parturients with spine joint abnormalities (including a history of trauma, surgery, deformities, or a history of lumbar intervertebral disc and scoliosis). ⑤ Parturients who requested a cesarean section. ⑥ Parturients with paralgia, a history of dependence on analgesics or sedative drugs, or a history of drug abuse. Patients who met the following conditions were rejected from the study: ① Parturients with delivery emergencies. ② Parturients who quit or who

initiated a withdrawal from the study. ③ Parturients with evident abnormal labor conditions, such as an excessive fetal presentation, and parturients who needed an emergency cesarean section. The parturients in the conventional group ranged in age from 22 to 34 years old (mean, 26.73 ± 5.17 years old). Their average body mass index (BMI) was 27.96 ± 3.65 kg/m². Their average gestational age was 39.41 ± 1.17 weeks. There were 12 patients with a history of miscarriage. The parturients in the combined treatment group ranged in age from 21 to 34 years old (mean, 26.82 ± 5.36 years old). Their average BMI was 28.09 ± 3.71 kg/m². Their average gestational age was 39.46 ± 1.21 weeks. There were 14 patients with a history of miscarriages. There was no significant difference in terms of the general information between the two groups ($P > 0.05$). The hospital's ethics committee approved the study protocol.

Methods

In accordance with the relevant standards of *Expert Consensus in the New Labor Standards and Treatment (2014)*, childbirth guidance, intervention, and adjuvant treatment were administered to both groups [8].

Conventional group: Free position was adopted and regular midwifery guidance was given in this group before delivery. The specifics were as follows. ① Spiritual consolation: midwives patiently explained the whole delivery process to the mother and her family members, emphasized that the delivery process is a natural physiological process to eliminate pregnant women's negative emotions such as tension and anxiety and to enhance their confidence, instructed the women to breathe regularly during the contractions and to get adequate rest between the contractions to restore their energy. ② Dietary guidance: the midwives instructed the parturients to eat more meals each day but to less at each meal before delivery to ensure a sufficient nutrition supply, and that the diet should be high-calorie, easy-to-digest food, and they should drink an adequate amount of liquids. ③ Urine guidance: The pregnant women were advised to urinate once every 2 to 4 hours to prevent the adverse effects of over-filling the bladder on the uterine contractions and fetal head decline. ④ Delivery

position instruction: The midwives explained to the mothers in detail about birth positions and assisted them to find comfortable ones (lying, sitting, standing, on all fours, squatting, semi-prone, sitting on the delivery ball, hip swinging, slow dancing and other methods) that are conducive to relieving their psychological pressure, pain, and discomfort during childbirth. The mothers were guided with methods such as breathing to relax fully for a smooth and natural vaginal delivery.

Combined group: In addition to the above-mentioned delivery methods, the conventional group underwent extra holographic meridian scraping. The specific methods were as follows. ① The scraping board and emulsion were produced by Beijing Oasis Source Medical Technology Development Co., Ltd. (patent number: 96201109.6) and were administered by doctors. The mother took a comfortable and free position and calmed down with assistance of the midwife; the mother's second metacarpal bone was scraped with the holographic three-dimensional fine scraping technique (the length of the scraping was calculated in millimeters by finger force, the breathing rhythm was controlled, the women were scraped using 30% to 50% force. The parturients kept breathing smoothly to regulate their Qi and blood, their balanced reinforcement and release of Qi, the moderate scraping pressure and speed, and the scraping frequency was consistent with the heart rate. ② Scraping at Hoku (Li 4) point: The corner of the scraping board was used to press on the Li 4 point. The corner plane of the scraping board was in contact with the skin at the acupoint. The acupuncture points were pressed gently and slowly to make sure the subcutaneous tissue and muscles felt the pressure in a degree; 20% to 30% of the scraping pressure should be applied in a Qi reinforcing way with a speed slower than the heart rate, at an angle $<15^{\circ}$ between the scraping board and the skin for 30 times along the direction of the meridian. Scraping at the Sanyinjiao (SP6) point: the edge of the scraping board was pressed at 90° on the acupuncture point, the scraping board should be in contact with the skin to ensure that the scraping force reaches the muscles or bones slowly by moving the scraping board about 5 mm back and forth, left and right, and kneading it. Releasing Qi method: 70%-90% of the pressure force should be

applied with a speed faster than the heart rate at an angle of $>45^{\circ}$ in the reverse direction of the meridian, for about 30 times. ③ Scraping requirements: The force applied on the skin should be gentle and even to ensure the parturient feels no pain. The duration for each scraping session should not exceed 30 minutes. The parturient was informed to avoid wind and cold, and to drink warm water after the scraping. ④ Guarantee measures: the parturient's Baihui points (GV 20) were scraped heavily, at the philtrum point with the edges and corners lightly, and the Neiguan (P6), Tsusan-li (ST-36) and Yongquan acupoints. The parturient was assisted with a supine position quickly and offered about 200 ml of warm sugar water if dizziness, pale complexion, flushing, cold sweats, cold limbs, nausea, vomiting, fainting, or other dizziness symptoms occurred. Before the scraping, fasting, excessive fatigue, hypotension, hypoglycemia, excessive weakness, and nervous tension conditions should be avoided, and appropriate relief measures should be adopted if necessary.

Observation indexes

We compared the two groups of parturients' time costs in each labor stage, blood losses at 2 hours postpartum, delivery indicators (the cesarean section rate, the vaginal delivery rate, and the oxytocin application rate during labor), the perineum injury indicators (the perineum injury degree, the perineal lateral resection rate, and the delivery satisfaction rates). The pain and anxiety of the two groups of mothers were evaluated, and the weights and health of the newborns were compared between the two groups after delivery.

The newborns' health levels were evaluated using their Apgar scores [9], the maternal pain was evaluated using the simplified McGill Pain Questionnaire (SF-MPQ), and the maternal anxiety was evaluated using the self-rating anxiety scale (SAS) [10]. SF-MPQ includes visual analogue score (VAS), pain rating index (PRI) and present pain intensity (PPI). The PRI contains two subscales of emotion and sensation, and there are four items in the emotional subscale and the sensory subscale, with 0 points indicating no pain, 1 point mild pain, 2 points moderate pain, and 3 points severe pain. The VAS scores range from 0 to 10 points, with 0 indicating no pain and 10 indicating severe

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Table 1. Comparison of the pain and anxiety scores between the two groups of women ($\bar{x} \pm s$, points)

Groups	n	PRI feeling	PRI emotion	VAS	PPI	SAS
Conventional group	60	26.85±6.91	9.06±1.48	8.51±1.02	3.93±0.87	5.99±1.06
Combined Group	60	19.50±5.83	6.99±0.86	6.09±0.99	2.70±0.73	3.68±0.99
t		6.298	9.356	13.189	8.418	12.348
P		<0.001	<0.001	<0.001	<0.001	<0.001

Table 2. Comparison of the two groups in terms of the time cost of each labor stage and the postpartum blood loss ($\bar{x} \pm s$)

Groups	n	Labor stage I (h)	Labor stage II (min)	Labor stage III (min)	postpartum blood loss in 2 hrs (ml)
Conventional group	60	9.85±2.14	33.89±5.30	9.43±3.01	232.42±24.41
Combined group	60	8.10±2.37	26.93±4.44	7.15±2.04	200.60±22.24
t		4.257	7.794	4.858	7.464
P		<0.001	<0.001	<0.001	<0.001

pain. The PPI scores range from 0 to 5 points. The higher the score, the stronger the pain. The SAS score ranges from 0 to 10 points, with 0 being no anxiety and 10 being intense anxiety. The degree of perineal damage was evaluated referring to the relevant literature [11]. Perineal injury is classified into four levels. Level I: the perineal skin and mucous membrane at the entrance of the vagina were torn, and less blood loss; Level II: the laceration reached the perineal body fascia and the muscle layer, the mucosa of the posterior vaginal wall was lacerated, and more bleeding occurred; Level III: the laceration reached the deep part of the perineum, the external anal sphincter was ruptured, and the rectal mucosa was still intact; Level IV: the anus, vagina, and rectum were completely connected, the intestinal cavity exposed, and the tissue laceration was severe. The satisfaction with the childbirth was investigated in an anonymous manner within two hours after the delivery, and the blood loss amount at two hours postpartum was measured using the volumetric method [12].

Statistical analysis

The statistical analysis was performed using SPSS 21.0 software, the measurement data were expressed as ($\bar{x} \pm s$), and investigated using t tests; the count data were expressed as n(%), and analyzed using chi-square tests, and the rank data were examined using the rank sum tests. Significance was claimed at $P < 0.05$.

Results

Maternal pain and anxiety scores

Table 1 shows that the maternal pain and anxiety scores in the combined group were lower than they were in the conventional group ($P < 0.05$).

Labor times and postpartum hemorrhaging

Comparing the time spent in each labor stage and the blood loss at 2 hours postpartum, the combined group was superior to the conventional group ($P < 0.05$). See **Table 2**.

Delivery indicators

The combined group outperformed the conventional group in terms of the vaginal delivery rate, the cesarean section rate, and the oxytocin application rate during labor (5.00% vs 18.33%, 5.00% vs 20.00%, and 6.67% vs 25.00%) ($P < 0.05$). See **Table 3**.

The maternal perineum injury indicators and the delivery satisfaction rate

The indicators regarding the perineum injury rate, the perineal lateral resection rate, and the delivery satisfaction rate were in favor of the combined group when compared against the conventional group (75.00%, 18.33%, 91.67% vs 48.33%, 40.00%, 66.67%) ($P < 0.05$). See **Table 4**.

Table 3. Comparison of the delivery indexes between the two groups of women [n (%)]

Groups	n	Vaginal delivery rate	Cesarean section rate	Oxytocin
Conventional group	60	11 (18.33)	12 (20.00)	15 (25.00)
Combined group	60	3 (5.00)	3 (5.00)	4 (6.67)
χ^2		5.175	6.171	7.566
p		0.023	0.013	0.006

Newborn conditions

The t-tests showed in **Table 5** that the Apgar scores of newborns in the combined group were higher than they were in the conventional group ($P < 0.05$), but there were no significant differences in the newborns' weights between the two groups ($P > 0.05$).

Discussion

As a normal physiological process, natural delivery is beneficial to mothers and newborns, and substantially reduces the odds of adverse outcomes. Natural childbirth is considered the preferable childbirth solution worldwide [13, 14]. The process of natural childbirth needs to be completed by taking various factors into consideration such as the fetus, fertility, the birth canal, and the maternal psychological state. Natural childbirth is a natural physiological phenomenon rather than a kind of disease, but the contractions in the process can cause pain, anxiety, irritability, etc., and easily induce problems such as uterine weakness, prolonged labor, and postpartum hemorrhage [15, 16]. It thus serves as important goals of the obstetrics department in China to promote natural delivery and reduce the rate of cesarean sections. As a critical factor that interferes with natural childbirth, pain can induce psychological problems such as anxiety, abnormally high blood pressure, and excessive activation of the renin-angiotensin-aldosterone system, which have detrimental effect on the fetus, the delivery process and the mothers. As is known, pain during childbirth is extremely intense. Therefore, analgesics during childbirth remain an leading topic in obstetrics. Nevertheless, due to the adverse effects of analgesics on mothers and babies, non-drug analgesic solutions for promoting natural delivery and improving the safety of the mother and child are urgently needed.

The World Health Organization (WHO) proposes to adopt free position during natural childbirth to relieve the pain and improve the comfort of the parturient during childbirth, wherein the physical strength of the parturient can be maintained, and fatigue and pain reduced. Delivery positions chosen on their own can significantly improve the mothers' mental health and self-confidence. Holographic meridian scraping is a commonly-used non-drug treatment based on TCM meridian theory [17, 18]. The practice of holographic meridian scraping treatment in labor, scraping the meridian in a forward direction, reverse direction, heavily or lightly, to reinforce energy or to release, scrape and press on the different acupoints, can promote the circulation of blood & Qi in the meridians, improve the body circulation, blood supply, relieve pain, enhance the blood oxygen supply in the uterus and birth canal, maintain maternal physical strength, promote uterine contractions, shorten labor, and reduce fetal distress. Additionally, it can reduce the discomfort of the parturient during delivery by enhancing the blood supply and improving microcirculation.

The results of this study showed that the pain and anxiety scores of the puerpera in the combined group were lower than they were in the conventional group, suggesting that the holographic meridian scraping combined with the free-position delivery method can alleviate women's labor pain and anxiety. The research on scraping for relieving pain and anxiety has received widespread attention, and it has been reported that scraping can significantly relieve the pain of patients with osteoarthritis and lumbar disc herniation, improve the moods of perimenopausal women, and improve patients' quality of life [19]. What's more, the time spent in each labor stage in the combined group was shorter, and the amount of bleeding at two hours postpartum was less in comparison with the conventional group, indicating that this technique can promote the labor process, reduce postpartum hemorrhaging, and promote postpartum recovery. Furthermore, compared with conventional group, the oxytocin application rate, the cesarean section rate, and the vaginal delivery rate in the combined group were lower. This suggests that the com-

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Table 4. Comparison between the two groups in terms of their maternal perineum injury indexes and their delivery satisfaction rates [n (%)]

Groups	n	Perineal damage			Lateral perineum	Delivery satisfactory
		No injury	Injury level I	Injury level II		
Conventional group	60	29 (48.33)	13 (21.67)	18 (30.00)	24 (40.00)	40 (66.67)
Combined group	60	45 (75.00)	8 (13.33)	7 (11.67)	11 (18.33)	55 (91.67)
Z/ χ^2			-3.067		6.817	11.368
P			0.002		0.009	0.001

Table 5. Comparison of newborn conditions between the two groups ($\bar{x} \pm s$)

Groups	n	Newborns' Apgar (score)	Newborns' Weight (kg)
Conventional group	60	8.71 $\pm$ 0.66	3.47 $\pm$ 0.13
Combined group	60	9.39 $\pm$ 0.37	3.48 $\pm$ 0.15
t		7.003	0.091
P		<0.001	0.928

combined method achieved meaningful results in assisting natural delivery, reducing the intervention rate, the cesarean section rate, and the application rate of oxytocin during labor. Importantly, the perineal injury and perineal lateral resection rate in the combined group were lower than they were in the conventional group. A possible explanation is that the combined delivery treatment is beneficial to the mother's psychological preparation, and a relaxed birth canal and the blood supply. A great body of evidence suggests that scraping can promote local blood circulation, increase the secretion of catecholamines, and increase the secretions of the hypothalamus, pituitary-adrenal cortex, improve the effects of the analgesics, promote the excitability of the maternal nervous system, improve the body's tolerance to stress, and significantly shorten the labor process. In addition, scraping can improve muscle function and enhance maternal motivation for delivery [20]. Also, we observed a higher delivery satisfaction rate and Apgar scores in the combined group, suggesting that the combined delivery can improve the blood gas supply of the fetus in the uterus and reduce intrauterine distress by improving microcirculation and enhancing blood supply. The limitations of this study included the following: (1) An insufficient sample size. (2) A relatively short follow-up time. (3) A single-center designed study.

In summary, holographic meridian scraping combined with the free position delivery technique is a satisfying option for delivery because of the combination's numerous strengths, such as a small perineal injury, a lower risk of perineal lateral resection, cesarean section, and intervention, and fewer side effects.

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Disclosure of conflict of interest

None.

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